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Learning Environments

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Abstract

This article presents the conceptualization, characteristics, national and international research on learning environments. For this purpose, a bibliographic review of approximately fifty sources was carried out. Based on these, the conceptualization and characteristics that learning environments should have in order to be effective in teaching-learning processes were elaborated according to the authors reviewed. Likewise, an international overview structured by continents was developed on research in which diverse elements of study were identified; and a national overview divided by regions, in which definitions, research and work carried out are evidenced, all following a chronological order. Finally, the article focuses on how Colombia can improve learning environments through the role of teachers and their training.

Keywords: Educational environment, teacher competencies, pedagogical practice, teaching process, learning.

"The true art of the teacher is to awaken the joy of work and knowledge" [our translation]

Introduction

"Everyone has the right to education". This is stipulated in Article 26 of the Universal Declaration of Human Rights (United Nations General Assembly, 1948), and has been assumed by many governments in the world, aware that this is a means that can make the world healthier, safer, more environmentally pure, united and prosperous, socially, economically and culturally (United Nations Educational, Scientific and Cultural Organization, 1990). In this way, much has been studied about education and the variables linked to it.

It is estimated that in the world more than 100 million children and adults have not completed the basic education cycle, and that there are others who have done so but have not acquired essential knowledge and skills (United Nations Educational, Scientific and Cultural Organization, 1990), which is due to many factors, among which are learning environments (Viveros, 2011) and their related variables, especially the role of teachers and their training (Universidad Autónoma Metropolitana Unidad Iztapalapa, (n.d.)).

It is no secret that if teachers are not well trained, the probability that students will not be able to achieve success in the teaching-learning processes is quite high. In a study conducted in Kenya in 2010, teachers and sixth grade students were evaluated in mathematics. The average teacher score was 60%. It was not expected then that students would also score around 47%. None of the participating educators demonstrated complete mastery of the subject. No doubt, this could have happened elsewhere, which invites us to reflect on what we do about the subject (United Nations Educational, Scientific and Cultural Organization, 2012).

It is for this reason that the present article arises, whose purpose is to expose the conceptualization of learning environments, characteristics that, according to diverse reviewed studies, they should have to be effective, studies carried out internationally, until arriving at what we have in Colombia, in the Andean and Caribbean and Insular regions, which is where more investigations were found related to the topic, and how, from the approach towards the teacher's role and its formation, it is possible to harness the cognitive abilities of the students of the basic cycle. All this is the result of a bibliographic review, in which texts and authors were selected who, according to experience and pedagogical practices, bring together key variables and concepts to understand learning environments and their approach to the role of teachers.

Conceptualization of the term learning environment

When it comes to learning environments, there is much literature on the subject, ranging from traditional and constructivist environments, virtual spaces, interactions and communications, the influence of teachers and their creativity, to how they can be constructed to be effective (Organisation for Economic Co-operation and Development, 2006). In other words, all the related variables are exposed and how they influence the improvement of their characteristics, so that they fulfill their purpose in the teaching-learning processes.

A conceptualization of the term learning environment can be based on the definition given by A. C. CEP Parras points out, indicating that it refers to the scenario in which favorable learning conditions exist and are developed, a dynamic space and time in which individuals develop capacities, competencies, skills, and values, which leads us to think that the space must change as innovations are introduced, and not only this, but all the practices that take place in it, it is there when the teacher is required to transform it and there is coherence between his or her discourse and his or her actions. Likewise, Ospina conceives the learning environment as a daily construction and reflection, singular that assures diversity and with it the richness of life in relation (Duarte, 2003).

One more definition that supports the above mentioned, indicates that a good educational environment is one that allows students' learning to grow in quality, which happens when there are teachers who daily create pedagogical scenarios to teach how to learn, recognizing students' previous knowledge, the construction of knowledge and the resolution of problems in in the contexts in which they are (Ministry of Education, 2010).

In this order of ideas, *Colombia Aprende*, includes all the mentioned before, pointing out that the term refers to the space in which the students interact, under favorable physical, human, social and cultural conditions and circumstances, to generate meaningful learning experiences, being these the result of activities and dynamics proposed, accompanied and guided by a teacher. Its purpose is to build and appropriate knowledge that can be applied to the life of the individual (Ministry of National Education, 2011).

The Glossary of Educational Reform establishes a greater connotation of learning environment by stating that more than the physical components, it includes the characteristics of the students, the objectives of the teaching-learning process, the activities that support it, the evaluation strategies, and the culture that infuses it. It also includes how individuals interact and how teachers can creatively create an environment that facilitates learning (Great Schools Partnership, 2013).

On the other hand, another concept more focused on the interactions that occur in the learning environment, beyond only the physical space, allows us to think about the environment that acts with the human being and transforms it, therefore, we must take into account the spatial organization, the relationships between people, with the objects, the roles and criteria established, and the activities that take place in it (Téllez, 2014).

One more concept points out that the learning environment is constituted by all the physical-sensory elements, such as light, color, sound, space, furniture, etc., that characterize the place where a student has to carry out his or her learning, which must be taken into account so that this is possible, in order for the student to enhance his or her abilities. Also, Loughlin and Suina, indicate that "the learning environment is an environment arranged by the teacher to influence the life and behavior of children throughout the school day," and this is achieved by organizing the physical space (Cited in Garcia-Chato, 2014).

A concept that supports several of the above definitions of learning environment defines it as that place, context and culture in which students learn, which includes the interactions between the different elements that converge in it.

Thus, it can be physical, remote, virtual, in school, outside, it does not necessarily have to be a classroom with a board and many desks, the important thing is to create the right space in which students learn in the best way. This, keeping in mind that learning can occur in a variety of settings (William, 2014).

It is important to emphasize, from the previous conceptualization, the role that the teacher has in most of the learning environment concepts. Highlighting the power of the relationships between individuals, the roles, criteria and strategies established, as well as the dynamism. In this way, the role that the teacher plays is fundamental so that learning environments can transcend and fulfill their purpose.

Characteristics of learning environments

The Glossary of Educational Reform has certainly expressed it: "there is no single optimal learning environment. There are an infinite number of possible learning environments, which is what makes teaching so interesting" (Great Schools Partnership, 2013). This is the reason for so much research on the subject that seeks to find ways to enhance and improve them (United Nations Educational, Scientific and Cultural Organization, 1990), some focusing especially on the establishment of characteristics that allow for maximum benefit and that make it possible to build them following the same pattern, however, this is not always possible, but it is possible to detect certain common points. The following are the main characteristics that learning environments should have, according to the review of studies by different authors:

a) The learning environment is conceived as a problem, as a means of life and relevance

Learning environments should be seen as a problem, through which the student can discover mysteries and find his own solutions, by appropriating knowledge related to the investigation, evaluation and action of the issues that are inherent to him. On the other hand, they are also conceived as a means of life and relevance because individuals are creators and actors of their own livelihood (Viveros, 2011).

b) The learning environment is a resource

Learning environments become depleted and degraded, so they must be sustainable and equitable, with a group organization, in which all actors work together (Viveros, 2011).

c) The learning environment is flexible

Learning environments must be able to be modified and adjusted to the territory to which they belong, according to the type of educational model established (Téllez, 2014). Likewise, they must be designed in such a way that they adapt to changes, for which it must be predicted how the technologies and learning modalities will evolve. To achieve this flexible condition, architects are designing learning classrooms with movable furniture and walls that can be easily reconfigured for different class sizes and subjects (Organisation for Economic Co-operation and Development, 2006). This same flexibility may also be possible when two classes are combined into one for team teaching (Osborne, 2013).

d) The learning environment encourages autonomous learning and generates spaces for interaction

Adequate learning environments should allow students to be responsible for their own learning process (Ministry of National Education, 2011), that is, the teacher is not the only one who knows the subjects, the students should also build their learning (Campos & Guevara, 2009). Similarly, these educational environments should provide spaces for interaction between students, so that learning is built together, enriching the production of knowledge with teamwork. It is also important that the learning environment allows students to take risks, be creative and critical, and that is where the role of the teacher comes in, facilitating this and making them aware of the needs (Davies, et al., 2013).

The Organization for Economic Cooperation and Development (OECD) supports this, noting that school buildings should inspire curiosity and encourage interactions between individuals (Learning Environments of the 21st Century). However, for this to be possible, teachers need to have the tools and space for collaborative planning and information sharing (Organization for Economic Cooperation and Development, 2006).

One point that needs to be emphasized is that the interaction, besides being between individuals, is also between the individual, objects and everything that makes up the environment. The George Lucas Educational Foundation, points out that interaction with the natural environment is good for learning, which was evidenced in a study with more than 10,000 fifth grade students, which showed that children in schools with a view of nature obtained higher scores in reading and math than those with an urban view. He also states that the greener the child's play spaces, the more reduced their attention deficit symptoms, and that research conducted in 2009, in which researchers introduced leafy plants into a classroom, found a positive impact on student well-being and behavior, with fewer hours of school missed due to illness and disciplinary events (Uncapher, 2016).

e) Learning environments must have appropriate materials

These tools are related to the use of time and space (Davies, et al., 2013), access to resources (including technology) and a special type of infrastructure, in which classes outside the classroom are possible (Uncapher, 2016).

Research conducted in New Zealand in 2013 indicates that two of the characteristics of a modern learning environment are openness and access to resources. The first refers to a special type of infrastructure that is being implemented in some countries, schools with few walls, more windows and a common place, which is a central space (Hub) of teaching and learning, which can be shared by several classes. This generates opportunities to observe and learn from the teaching of others and can be observed in return. They also make it possible to access what students in other areas and levels of learning are learning, so that teaching and learning can be complemented and enhanced. This same openness also refers to the fact that there should be no clearly visible boundaries, but rather it fosters relationships with knowledge and between individuals who seek to establish cultural experiences crossed by meaningful, mobilizing, motivating practices (Osborne, 2013).

Access to resources refers to the fact that learning environments must be surrounded by spaces that allow the exercise of different activities, such as reading, collaborative work, wet areas, among others, in which it is also possible to access technologies as the student requires them (Osborne, 2013).

f) Learning environments must capture and develop teacher professionalism

The teacher's role in learning environments is essential, and he or she must find ways for students to enhance their skills. The teacher is no longer the only source of information and becomes an active participant in the learning community, providing feedback and support to his or her students and encouraging them to be self-directed in their learning (Viveros, 2011). Relationships between teachers and students change, and it is suggested that they become more friendly, adding that the learning environment should reflect an understanding of how people learn, which allows students' academic performance to improve, increasing confidence, resilience, motivation, commitment, developing social, emotional and thinking skills, and improving attention in school (Davies, et al., 2013). Additionally, it is added that it is no longer possible to predict exactly what knowledge people will need to know, information is freely available like air or water, and it is not what you know, but what you can do with what you know (Centre for Educational Research and Innovation-CERI, (n.d.)).

International overview of learning environments

By immersing oneself in the world of research related to learning environments in different countries, especially those that are in the ranking of the most outstanding educational models in the world (Ortega, 2017), one can find numerous studies with diverse approaches, which aim to demonstrate the impact of learning environments on the rate of learning, on academic achievement, on creative skills, among other objectives. The following researches are highlighted from the bibliographic review carried out, organized by continents and year in which they were carried out.

a) Europe

In 2005, a study was conducted in the United Kingdom related to the impact of learning environments, engagement, emotional state, care and well-being on student achievement in 30 primary schools in the United States, United Kingdom, India and Russia. It found that even though the extremes of environmental factors influence students and teachers negatively, once minimum standards are reached, the evidence of the effect is less clear. Thus, there may be a change that improves the environment, but the most important thing is how that change is managed, because to be effective, a link must be established between teachers, students, building users and environmental change. He concludes by stating that it is worthwhile to change the environment if this is done as a design process that takes into account all the variables, and focuses on studying the systems and processes, products and services, environment and communication, all of which must always be supported by a pedagogue (The Centre for Learning and Teaching School of Education, Communication and Language Science, 2005).

In 2006 in the Netherlands, research was carried out that sought to answer how much variance in student motivation could be explained by teacher behavior, and what was the magnitude and direction of the effects of teacher influence and proximity on the motivation of specific subjects. The effect of teaching on motivation was investigated. The results showed the importance of the teacher's behavior in the student's motivation. It was also observed that when students were motivated, a particular type of positive learning behavior was generated in the teachers (Brok, 2005).

In Northern Ireland in 2012, research showed how technology, through a virtual learning environment called *AmbiLearn*, educational games and assessments in math and language, improved the learning of primary school students in various institutions in a fun way (Hyndman, Kevitt, & Mc, 2012).

In 2015, a study applied to a population of 3,766 primary school students, conducted in the United Kingdom, was developed to determine if there was any impact of school building design on the learning

rate of primary school students. It was found that principles such as naturalness, individuality, and stimulation affected their progress. The first was composed of factors such as light, sound, temperature, air quality, and links to nature. The second was made up of appropriateness, i.e., how the room met the needs of the individuals, flexibility, whether the room addressed the needs according to age, and connection, which indicated how quickly the students connected with the school. The third principle was complexity and color, which indicated how exciting the classroom was and how it managed to focus students' attention. The results determined that naturalness produced 50% impact on learning, while individuality and stimulation represented only 1/4 each. Likewise, of these, only the factors light, temperature, air quality, property, flexibility, complexity and color explain 16% of the variation in academic progress achieved by students (Barrett, Davies, Zhang, & Lucinda, 2015).

b) America

In 2005, Éric Schaps published a study related to interactions and collective work, which attempted to determine the influence of a supportive school environment on the academic success of students, under what conditions, building a culture of caring in the school or community helps or hinders academic achievement and how building community in the school affects achievement outcomes. To answer these questions, the author compiled a series of investigations, in which the learning environment described under the concept of a friendly school climate allowed students to achieve academically. An example of these was Fifteen Thousand Hours, whose objective was to determine the effects of secondary schools on children in 12 schools in London. It found that when students identified with their standards and goals they generally had high levels of achievement, which was more likely to occur if the school environment was friendly and school staff were positively disposed towards students, if there were numerous shared activities between staff and students, and if there were widely shared positions of responsibility among students in the school.

A second example in Éric Schaps' text is the study conducted in 2002, whose sample was about 80,000 students, and which concluded that school connection was positively related to grade point averages (Schaps, 2005).

In “Improving Students' Relationships with Teachers to Provide Essential Supports for Learning”, Rimm-Kaufman and Sandilos mention that improving teacher-student relationships helps students develop socially and achieve higher academic standards (Rimm-Kaufman & Sandilos, 2015). This makes sense, because students will feel confident, take risks to express themselves, and thus be able to build their knowledge, as indicated by the interaction characteristic of learning environments mentioned above. Researchers from the American Psychological Association show this by showing an example of research developed by Birch & Ladd in 1997 among kindergarten children in which those who had better relationships with teachers performed higher on measures of early academic skills. Similarly, a more recent study, which analyzed student-teacher relationships throughout elementary school, found that teacher-student closeness is linked to gains in reading achievement. It concludes by recommending that communicating with students requires talking to them, motivating them, and encouraging teamwork (Rimm-Kaufman & Sandilos, 2015). This needs to be complemented by the fact that students' performance is also affected by the way their teachers teach them (Rachel, Nnamdi, & Thomas, 2016).

In 2016, the George Lucas Educational Foundation determined how factors such as light, nature, and classroom design comprised of noise, temperature, and chair arrangements can affect students' cognitive performance. Regarding light, it establishes that the daytime stimulates learning, while the nighttime makes it more difficult. This is supported by a study of 21,000 elementary students in the United States, during a school year, which showed that children exposed to more sunlight during the school day showed reading scores 26% higher and 20% more math scores than children in less sunny classrooms.

In turn, the effects of noise make it difficult for children to stay focused on their work, profoundly affecting reading, writing, and learning comprehension skills, and overall academic performance. Temperature, if out of a comfortable range, can be distracting. And the arrangement of chairs and desks has an influence as it can slow down the speed of completion of tasks, so they recommend that they be in groups, semi-circles, clusters, and so on. The author concludes that there are many things about built and natural environments that can affect student learning (Uncapher, 2016).

c) Asia

In 2005 in South Korea, research was conducted with 76 sixth grade students. The objective was to confirm the effectiveness of constructivist teaching and other educational teachings in terms of academic achievement, student self-concept and learning strategies. The researchers concluded that constructivist teaching is more effective in terms of students' academic achievement, however, it is not effective in terms of improving students' self-concept and learning strategy, also noting that students prefer constructivist teaching in the classroom (Kim, 2005).

In Turkey in 2013, research was conducted that showed the negative effects of making information technology the center of elementary students' learning environments, stating that it can cause many problems and should be used as a complement to classroom activities because students learn better psychologically and mentally by interacting with what they are studying. It only takes away valuable learning time, when students are not experts at handling them and everyone has different skills, and it can turn educational experiences into games. In this way, the author indicated that the main factor in learning environments is the teacher and the books, which allow obtaining precise information, and that even though it is important to educate these children in technology, it must be done at a pace that satisfies the needs of each individual (Ates, 2013).

d) Africa

In Nigeria in 2016, a study was conducted with a sample of 243 students divided into a constructivist and a transmissive group. The results showed that students in the constructivist environment achieved more, as well as students with high skills, regardless of the type of environment they were in, did better than those with low skills, which shows that learning environments do not impact learning ability. For this reason the author suggests that teachers try to create the constructivist environment by focusing on low ability groups to reduce the gaps in scientific knowledge. However, he also points out that despite their shortcomings, there is evidence that communicative methods such as lecture can be effective in teaching scientific concepts to students. He concludes, then, that even though each type of environment has its advantages and disadvantages, the one that generates the best results in learning science should be chosen (Rachel, Nnamdi, & Thomas, 2016).

From the previous studies, it was possible to evidence different research approaches around learning environments. We identified the influence of school design on learning environments, and how it can hinder or facilitate the development of individual students' active and creative skills (Rachel, Nnamdi, & Thomas, 2016), as well as how technology improves or produces negative effects, and the importance of supportive relationships and collaborative work to optimize educational environments. However, it is possible to identify one key point and that is student-teacher interaction, emphasizing that if learning environments are to be improved, one must begin with how students learn and how teachers teach, and not that students must learn what teachers teach.

Overview of learning environments in Colombia

The desire to improve the quality of education, has motivated many researchers, teachers, architects, students of pedagogy, Secretaries of Education, Ministry of Education, Mayors and scholars of the subject in Colombia, to think outside the box and look at what is being done in other countries in terms of improving learning environments.

The following will present concepts, elements and studies regarding educational environments in Colombia, mainly in cities of the Caribbean and Insular Region and the Andean Region.

a. Learning environments in the Caribbean and Insular region

As for concepts of educational environments, those compiled in a research article from the Universidad del Norte stand out, in which it is established that learning environments are those conditions and circumstances given in an educational institution that help favor the ends of education, which are nothing in themselves if there are no spaces for interaction mediated by the teacher so that the students generate some type of learning (Colectivo Educación Infantil y TIC del Instituto de Estudios en Educación (IESE) from Universidad del Norte, 2014). Similarly, these should be designed to be meaningful, taking into account that not only the classroom is a learning environment, but all places where students learn by interacting with their peers and with the environment (Posada, 2009)

It also highlights the definition in the book Quality of Education and Intelligent School Organizations, in which the meaning of learning environments turns out to be one of many concepts of "class", defined as a concept of ecology, used to describe the state of social relations in the classroom, highlighting that it is not the teachers who directly influence the learning of students, but they make it possible if they positively stimulate the facilitating factors (Posada, 2009), in this way, these two concepts complement each other by taking for granted the role of the teacher as a mediator.

Depending on the elements of the learning environments, two studies were reviewed that highlight how Information and Communication Technologies (ICT) can be used to make them effective. The first one indicates that ICTs are important because they allow the development of the students' dimensions and competences, enriching the learning environments, as long as the teacher has a clear concept of them, is constantly trained and has the purpose of using them.

Likewise, it is added that these support tools change the traditional teaching-learning processes, since the teacher is forced to change his role. However, in order to eliminate the concern about the management that teachers can give these tools, the concept of hybrid learning environments arose, those in which in the teaching, personal instruction and ICTs are given simultaneously, to achieve balance in the classroom (Colectivo Educación Infantil y TIC del Instituto de Estudios en Educación (IESE) de la Universidad del Norte, 2014).

The second research, is a methodology used in a Barranquilla School since 2015, called Self Organized Learning Environments (SOLE), in which learning emerges from the collaborative and coordination structures of students in interaction with technological devices and the Internet. The learning achievements through this methodology, point towards the increase in students' verbal fluency, the incentive of their creativity and a greater attention and maturity when it comes to learning, in addition to the fact that they build their own knowledge (District Secretary of Education, 2016), as well as an improvement in their performance on standardized tests such as Saber 11, in which they have managed to move up a category (District Secretary of Education of Barranquilla, 2016).

Regarding the role of teachers and interactions and how these allow educational environments to be successful, Rodolfo Posada states that factors such as good interpersonal relationships, teamwork, meeting needs, facing daily problems, organizational climate and sense of belonging, are the most related to the educational quality of the more than 600 members of different educational communities in the Caribbean Region. A point that is of special attention in his thesis is the relationship that the class has, with the physical space, considering the physical parameters of the classroom, the human group, focusing on psycho-affective and work relationships, especially the language of the teacher, and the learning environments, in terms of interactions and climate, in which these terms are seen as synonymous in some way (Posada, 2009).

In this way, the importance of the role of teachers, since they must awaken curiosity, develop autonomy, create the conditions necessary for successful teaching, make learning environments attractive to students, and provide them with the keys to understand and perform in the information society. Thus, it brings up what the United Nations Development Program (UNDP) considers that the school organization of the 21st century needs in terms of teachers: respect for the teacher, demanding recruitment, competitive salaries, freedom of criteria, salary increases based on achievements, promotion based on merit, symbolic stimuli, constant updating and evaluation by users. (Posada, 2009).

Further research that confirms the importance of teachers in learning environments indicates how these influence school dropouts, since not only students are responsible for their success, but all members of the educational system are responsible for generating teaching and learning environments that seduce students, encouraging them to stay in school (Rodríguez & González, 2009).

b. Learning environments in the Andean Region

As for the definition of a learning environment, the one in the article Ambientes de Aprendizaje del Siglo XXI (Learning Environments of the 21st Century) stands out, which states that learning environments go beyond the physical or virtual. It is in what is understood by education, by man, by formation, that is, it includes the philosophical posture regarding the education of individuals linked to the conception of the institution (Correa, 2008).

The role of the teacher and his or her importance in creating learning environments has been studied extensively, especially in the departments of Antioquia and Cundinamarca. Initially, a study carried out in the University of Antioquia stands out, in which a conceptualization of the term learning environments was made. Within this, the points of view of three authors stand out, the first of which raises the complex relations that exist between play and pedagogy, as well as the use of educational materials from a critical and innovative position that allows building knowledge with children. The second one indicates that within the learning environments, communication and the encounter with people must be made possible.

The third shows that there is a coincidence between the structure of the relationships and the spatial arrangement, which favors individualization and socialization. This study ends by pointing out, in a somewhat poetic way, that the classroom is where the most faithful and true interactions between the protagonists of education are evident, and once the doors are closed, these interactions begin, which only their actors can account for. It is at that very moment when the teacher is made and shown, desires become reality, it is not the world of what could be, but the space of what is. In this way, it takes for granted the teacher's role in all these interactions within the learning environments (Correa, 2008).

A second study conducted in Bogotá shows the challenges teachers face today in improving learning environments, since they must be an agent of change that enhances student learning. In this way, they must innovate so that students learn and develop multiple competencies for life. For this, four competencies are required of the teacher, the first is the management of the curriculum and the development of intellectual and abstract thinking skills. The second is the ability to arouse intellectual curiosity in students using innovative teaching techniques, information and communication technologies. The third is the ability, values, attitudes and capacities for the human formation of subjects. And the fourth, is that it must be able to address cultural and linguistic diversity, learning styles and the starting point of students. (Obaya, Vargas, & Ponce, 2012).

A third research conducted in Valle del Cauca, shows that teachers should encourage students to use their knowledge, to share it with respect for others, to develop critical thinking, to be creative and to participate in open and meaningful dialogues. In this way, the teacher presents himself as an instructional designer, an instructor and a cognitive mediator. The first role indicates that the teacher must design the learning environments, define the initial conditions, objectives, thematic units and minimum knowledge to be acquired. The second role refers to the teacher's ability to use the teaching skills. The third role, guides the process, explains and how to acquire the collaboration tools. Thus, through this study, we

take for granted how important are the different roles that the teacher must assume in order for the learning environments to be meaningful. The teacher must help the student to develop his or her talents and competencies, transforming his or her way of teaching, as well as continually committing himself or herself so that the whole process can be successful (Collazos, Guerrero, & Vergara, 2001).

Two more studies show the importance of the teacher's role in learning environments. The first, carried out in Bogotá with primary school students, tried to determine how the pedagogical relationship between teachers and students influences the teaching-learning processes, justifying the problem with the argument that the only ones responsible for the results are not the students, but that the teachers' pedagogical practices can have a direct effect on learning difficulties. Likewise, teachers' lack of knowledge about the complexity of learning environments does not allow them to create motivating educational environments to meet the needs and to awaken students' desire to learn. In this way, the teacher must change his or her position, ceasing to be the only source of information and becoming a motivator, hence the importance of an adequate relationship with the student, so that they can walk together, that both have their eyes set on the same objective (Campos & Guevara, 2009).

A second document, complements the previous paragraph, stating that the teacher must assume the role of coach, in which he or she employs deep conversations and feedback to discover with the student the origin of his or her difficulties and in this way the student can improve and develop his or her potential. This is in order to generate not only cognitive but also emotional change (Girlado, 2015).

In this order of ideas, it is important to mention a theme of innovation that relates teacher training to their ability to act as change agents that transform learning environments by making them more effective. This is the Mova, a center of teacher innovation, which provides the possibility for teachers to be trained integrally "facilitating the development of personal and professional proposals aimed at generating educational experiences and pedagogical practices, based on dialogue and the exchange of ideas and experiences" (Secretary of Education of Medellin, n.d.). It is especially important that Mova promotes and leads public policies for teacher training in Medellin, because it is clear that teachers are the main axis to transform society, always focusing on innovation. Its three principles are: to be to dialogue, to know to create and to create to innovate (Semana, 2014).

Up to this point, there has been a lot of talk about the role of teachers and their training within learning environments, it is also possible to find other elements of research related to educational environments. Technology and infrastructure, for example, are objects that can also be found in research. In Medellin in 2008, a proposal was made that showed that traditional education can evolve and be enriched by the incorporation of the development of competencies and pedagogical use of ICT, this is because learning environments are evolving rapidly and the actors in the educational process must be on par, that is when ICT comes in to generate new ways to face the activities and to achieve learning, through change and innovation, transforming the learning environments to adjust them to the conditions of the human being today. Thus, these educational environments become a dynamic space, with variations in time, resources and spaces, in the teachers and even in the students themselves (Correa, 2008).

In terms of infrastructure, the competition held by the Ministry of Education of Bogotá in association with the Colombian Society of Architects in 2015 stands out. Under the principles of openness and flexibility handled in the new global educational environments according to Frank Locker, a proposal made by Colectivo 720 was chosen to design the public schools of Bogotá, in which every square meter is an educational environment. This proposal is accompanied by a transformation of the mentality of the teachers, in which a school in the same city is being a reference point in the training that they must have in order to achieve successful teaching-learning processes (Tapia, 2016). Likewise, we should not forget the "School Revolution" led by the Secretary, a program that is generating more quality learning environments (Dinero, 2017). Programs like this last one are also being carried out in Medellin (Medellín, 2017).

Conclusions

What is needed to improve learning environments in Colombia under the teacher training approach?

The school environment component of the ISCE in Colombia is focused on measuring the classroom environment from the point of view of noise, discipline, interruptions, and the monitoring of learning from tasks, evaluations, and teacher-student feedback (Ministry of National Education and Colombian Institute for the Evaluation of Education, (n.d.)), identifying the importance of behavioral variables and interaction between students and teachers (Ministry of National Education and Colombian Institute for the Evaluation of Education, 2017). However, in comparison with international and national studies reviewed above, this index, although it evaluates the role of teachers, does not take into account their training. Nevertheless, the Ministry of National Education has a Program for All Learning (PTA) that seeks to strengthen the competencies of primary school teachers in mathematics and language in schools with low performance (Ministry of National Education, N.d.). In other words, in Colombia it is clear where the focus should be if we want to improve learning environments, and it should also be borne in mind that the competencies of all teachers should be continually strengthened, as proposed by the OECD, both at the beginning and in the development of the profession (Ministry of National Education, 2016). For this reason, scholarships are being granted so that teachers can continue their training (Ministry of National Education, (n.d.)) (Bogotá Secretariat of Education, (n.d.)).

Also, according to the OECD, in Colombia there are no standards that clearly establish the skills and knowledge that teachers must have in order to practice, training programs are not well designed, the teaching profession is not attractive to those with high potential, and there is no guarantee that the teachers in charge of training future graduates will adequately prepare students for entry into the profession. If teachers do not have the necessary skills, it is unlikely that they will be able to develop them in their students (Ministry of National Education, 2016).

In this way, if Colombia is envisioned for 2025 as the best educated country in Latin America, it still faces many challenges, one of which is precisely teacher training and its importance in creating meaningful learning environments, which as we have seen before, goes beyond creating just a scenario. It means building a pedagogical place to teach how to learn (Ministry of National Education, 2010), and this requires a teacher who facilitates, who listens and who understands the curiosity of his or her students (Colombia.inn, 2016). A teacher capable of creating meaningful environments and who plans the important process that will take place there, who has clarity in each strategy employed and who knows with certainty the purpose of using it. And just like a good doctor who uses a medicine for so long, and who knows that after that time he will get a result, the teacher must become a scientist, who knows how far and how he will take his students, in such a way that he will generate so much knowledge that he will influence the way other disciplines are taught, just as pedagogy has been influenced by other sciences (Castro, 2017).

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