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Constructivism in the pedagogical and epistemological conceptions of teachers

El constructivismo en las concepciones pedagógicas and epistemológicas de los profesores

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In recent years, pedagogical constructivism has enjoyed great popularity, so that many people recognize themselves as constructivists. In the literature it was found that many teachers reported having conceptions aligned to this paradigm, however, the results are contradictory in this regard. In this sense, the purpose of this work was to deepen the results of such research on teaching conceptions, specifically tracing a constructivist view of their practice, as well as the recommendations that the experts have made with regard to these results. A systematic review of the literature was carried out. Documents were searched in the Dialnet database. After applying different filters and assessing the relevance of the articles, 13 works were admitted for qualitative and quantitative analysis. Among the main results, it is emphasized that teachers maintain epistemological and pedagogical conceptions formed by different paradigms, which are not always coherent with each other, but present diffuse limits. For this reason, interventions are recommended that: 1) review paradigmatic differences at the theoretical level, 2) allow teachers to reflect on their conceptions and help them to externalize them, and 3) implement practical models in accordance with institutionally desirable scientific or pedagogical paradigms. It presents theoretical material organized with respect to constructivism to guide the first two phases.

En los últimos años, el constructivismo pedagógico ha gozado de gran popularidad, de tal forma que muchas personas se reconocen como constructivistas. En la literatura se encontró que muchos docentes señalaron tener concepciones alineadas a este paradigma, sin embargo, los resultados son contradictorios al respecto. En este sentido, el propósito de este trabajo fue profundizar en los resultados de tales investigaciones sobre las concepciones docentes, rastreando específicamente una visión constructivista de su práctica, así como las recomendaciones que los expertos han realizado con relación a estos resultados. Para ello, se llevó a cabo una revisión sistemática de la

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literatura. La búsqueda de documentos se realizó en la base de datos Dialnet. Luego de aplicar diferentes filtros and de valorar la pertinencia de los artículos, se admitieron 13 trabajos para el análisis cualitativo and cuantitativo. Entre los resultados principales se destaca que los profesores mantienen concepciones epistemológicas and pedagógicas conformadas por distintos paradigmas, que no siempre son coherentes entre sí, sino que presentan limites difusos. Por tal motivo, se recomiendan efectuar intervenciones que: 1) revisen las diferencias paradigmáticas a nivel teórico, 2) permitan reflexionar a los profesores sobre sus concepciones and le ayuden a externarlas and 3) se implementen modelos prácticos acordes con los paradigmas científicos o pedagógicos institucionalmente deseables. Se presenta material teórico organizado respecto al constructivismo para orientar las dos primeras fases.

1. INTRODUCTION

Human beings learn every day, anywhere, with different people and about different aspects. The nature of our learning is so dynamic that we can learn both with and without intention. In this way, every time we approach the world, objects and other individuals we are constantly building new schemes, ways of processing information, functions and new cultural artifacts. Although learning occurs in different areas, it is easily related to school education, and it is not that schools learn more, or less than in other areas, simply that it has become the formal and preferred place to the teaching and learning of knowledge, attitudes, aptitudes and recently of competences.

In school education, strategically organized content is provided to students, since the idea is to accelerate the learning process in students, and from there it is considered an artificial space. The teachers are the ones who mainly cover the task of educating the apprentices and they do it in different ways according to different factors and elements that they collect throughout their training and professional routine. Some of these aspects are their formative and personal experience and interaction with the world around them (Mellado et al., 2016). All this as a whole allows the elaboration of an educational conception on different aspects of their professional practice.

The pedagogical and epistemological conceptions are considered implicit theories that configure actions and strategies that teachers use to teach and learn, based on coherent or incoherent assumptions among themselves, depending on their articulation with different conceptions or according to the relationship that exists between what exists. the subject says and what he does (Medel et al., 2017).

The importance of inquiring about the teaching conceptions about different aspects of education lies in the fact that the influence of the teacher's thinking through his conceptions affects and conditions his educational practice (Amezcua et al., 2011; Caballero and Bolívar, 2015;

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Jiménez and Correa, 2002). Teachers even modify the curriculum to make it more compatible with their own beliefs (Urzúa and Rodríguez, 2018). In addition, it has been found that students' training processes are strongly influenced by their experience in undergraduate training processes (Urra et al., 2020), that is, with the teaching style of their trainers (Caballero and Bolívar, 2015; Castillo et al., 2018), which in the case of teachers in training implies that their conceptions may influence not only their current training process but also their future teaching activity (Pontes et al., 2015). In this sense, the teachers' beliefs cannot be underestimated (Urzúa and Rodríguez, 2018).

In Mexico, teachers have been influenced by different psychological and pedagogical paradigms that have had a boom at a certain time and that often respond to the ups and downs of educational policy and the recommendations of international organizations (Díaz-Barriga, 2002). In recent years, constructivism has enjoyed great popularity or, as some authors describe, is a fashionable trend (Mariño, 2002), to such an extent that many people assume themselves as constructivists (Chadwick, 2001). This has various implications, among them, the main one is that they seek to make proposals from constructivism to improve teaching practices and solve educational problems (Delval, 2001), from a certain approach with a discourse that tries to legitimize educational actions (F. Hernández, 2003) to answer questions such as: what to teach, when to teach, how to teach, and what, how and when to evaluate (Chadwick, 2001; Fernández et al., 2010).

Constructivism appears recurrently in books and magazines, in theoretical and research pronouncements, as well as in educational reforms and study plans of all levels and modalities (Fernández et al., 2010; Rigo, 2008). This does not necessarily imply that the understanding of constructivism has reached desirable levels of depth. In this regard, some research indicates that both in-training and consolidated teachers have a limited consolidation of this model despite the fact that they indicate following constructivist principles for their daily work (Pontes et al., 2015). That is, it has not yet fully transitioned towards constructivism.

The literature regarding the conceptions of teachers and pre-service teachers reveals contradictory results. In some studies, it is pointed out that current traditional teaching and evaluation practices are still maintained in school and focused on results, as well as superficial and mechanical strategies and a passive role in the learner (Amezcua et al., 2011; Medel et al., 2017). While other research suggests that constructivism is the paradigm with the greatest presence in teachers.

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That is why, in the present work, the aim was to carry out a systematic review on the main results found in the literature on teaching conceptions, specifically tracing a constructivist vision of their practice. It was chosen to follow constructivist conceptions because it has been found in the literature that students prefer teachers who have constructivist visions (Gargallo et al., 2010) and that these beliefs are related to the promotion of competences (Martínez and González, 2014).

Likewise, it was intended to trace some recommendations made by the experts regarding the results found. The foregoing will be relevant to guide progress in teacher training through deep reflection on their conceptions, as a fundamental part of the curriculum and teacher development programs (Amezcua et al., 2011; Jiménez and Correa, 2002). ´

2. METHOD

The objective of this research was to identify the main results found in the literature on teaching conceptions, specifically tracing a constructivist vision of their practice. To comply with the above, a systematic review of the specialized literature was carried out (Kugley et al., 2016; Leary and Walker, 2018; Sánchez-Meca, 2010; Sánchez-Meca and Botella, 2010). This was carried out in phases:

1. Search for documents relevant to the investigation. A systematic search for research articles was carried out in the Dialnet database. Texts published in Spanish, from any year, were accepted. Only a filter was applied on the type of document, accepting only journal articles, while theses, books and book articles were excluded.

2. Definition of inclusion and exclusion criteria for the documents obtained. The search in the scientific databases was carried out using the terms: (conceptions), (constructivists) and (teachers).

3. Reading and analysis of documents. In the database, the search for compliance with the inclusion criteria was carried out on the title, abstract, key words and extensive work. A total of 90 results were obtained. Subsequently, duplicate documents were identified and removed. In addition, a review of the relevance of the articles obtained was carried out and those that were not useful for the analysis of this research were discarded. Finally, 13 documents were accepted for the analysis: (Briceño and Benarroch, 2013; Castillo et al., 2018; Fernández et al., 2011; Gargallo et al., 2010; Jiménez and Correa, 2002; Marroquín and Valverde, 2019; Martínez and González,

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2014; Maturana and Cáceres, 2017; Pérez et al., 2018; Retana-Alvarado and Vázquez-Bernal, 2019; Rodríguez and López-Mota, 2009; Sánchez, 2005; Urzúa and Rodríguez, 2018).

3. RESULTS AND DISCUSSIONS

3.1 Constructivism in psychology

Regarding the constructivist paradigm, it is necessary to recognize that there are various theoretical currents that are clothed under what we know as psychological constructivism. In this regard, Serrano and Pons (2011) agree on this idea when they state that there have been several alternative explanations of psychological functioning that could be collected under the umbrella of constructivism and that respond to the dominant constructivist theoretical views in developmental psychology. Likewise, Serrano and Pons (2011, p. 2) stated that any type of classification of constructivisms that they try to propose includes explicitly or implicitly the existence of:

a) un constructivismo cognitivo que hunde sus raíces en la psicología and la epistemología genética de Piaget y,

b) un constructivismo de orientación sociocultural (constructivismo social, socio-constructivismo o co-constructivismo) inspirado en las ideas and planteamientos de Vygotsky.

In addition to these proposals, there are other constructivist approaches that should not fail to be mentioned because of their importance. These are more sociological in nature and close to social psychology such as social constructionism and radical constructivism, respectively. Despite the differences, these constructivist perspectives and those previously mentioned share an emphasis on the active re-construction of knowledge (Cárdenas, 2004; Cubero, 2005; G. Hernández, 2008).

The epistemological differences between *constructivisms* vary according to the degree of implication of the subject in the construction of their knowledge, from little participation to almost total participation and from the relationship established between the individual and the social or community (Aparicio and Ostos, 2018; Castellaro, 2012; F. Hernández, 2003; G. Hernández, 2008). In the words of Serrano and Pons (2011), the galaxy in which the possible approaches for

the constructivist interpretation of the teaching and learning processes move can be located on a continuum:

> desde la disociación entre lo individual and lo social, entre lo interno and lo externo o entre el pensamiento and el lenguaje […] entre la construcción del conocimiento en el sujeto individual, despreciando el componente socio-contextual de esa construcción (constructivismos endógenos) hasta posicionamientos que consideran el conocimiento social como la única fuente válida de conocimiento, con la consideración del sujeto colectivo como el elemento nuclear, negando, de esta manera, al sujeto individual (constructivismos exógenos), pasando por posiciones que postulan una dialéctica, más o menos declarada, entre el sujeto and el contexto, entre lo individual and lo social (p. 9).

Despite these detailed differences, it can be assumed that these theories are constructivist because their epistemological stance in general is described as: 1) constructivist, because it states that conceptual frameworks or schemes are constructed by the subject when interacting with different objects; 2) interactionist, because it recognizes the reciprocal action of the subject on the object, which it transforms and in this action, at the same time it structures itself and; 3) relativistic, because it cannot be considered a preponderance of the subject or the object, since both are associated and their participation is necessary and interdependent (G. Hernández, 2006).

In this regard, Barreto, Gutiérrez, Pinilla and Moreno (2006, pp. 15–16) pointed out that the common elements that characterize constructivism are:

> a) primero, la epistemología constructivista sostiene que nuestros conocimientos no se basan en correspondencias con algo externo, sino que son resultado de construcciones de un observador que se contacta indirectamente con su entorno, por lo que, nuestra comprensión del mundo no proviene de su descubrimiento, sino de los principios que utilizamos para producirla;

> b) segundo, el paradigma constructivista es un modo particular de ver el mundo, de interpretar la realidad partiendo de un conjunto de creencias, de supuestos para guiar nuestras actividades and que no pueden ser probados o refutados, pero que de todas maneras representan las posiciones que estamos dispuestos a adoptar and defender, supone que el conocimiento es una construcción mental, resultado de la actividad cognitiva del sujeto que aprende, concibiendo el conocimiento como una construcción propia que surge de las comprensiones logradas a partir de los fenómenos que se quiere conocer. El

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constructivismo se erigió como respuesta a las posturas empiristas and realistas que sostienen que el conocimiento es una copia fiel de la realidad, dejando al sujeto un papel pasivo frente a su propio proceso de conocimiento;

c) tercero, el constructivismo es una explicación acerca de cómo se llega a conocer, concibiendo al sujeto como un participante activo, que con el apoyo de agentes mediadores establece relaciones entre su bagaje cultural and la nueva información, para lograr reestructuraciones cognitivas que le permitan atribuirle significado a las situaciones que se le presentan.

In the general quantitative results of the characterization of the 13 investigations on the teaching conceptions, the following can be pointed out. They come from countries such as Spain (Gargallo et al., 2010; Jiménez and Correa, 2002), Mexico (Castillo et al., 2018; Fernández et al., 2011; Rodríguez and López-Mota, 2009; Urzúa and Rodríguez, 2018) , Chile (Martínez and González, 2014; Maturana and Cáceres, 2017), Colombia (Briceño and Benarroch, 2013; Marroquín and Valverde, 2019; Pérez et al., 2018), Costa Rica (Retana-Alvarado and Vázquez-Bernal, 2019) and Venezuela (Sánchez, 2005).

They date from 2002 (Jiménez and Correa, 2002), 2005 (Sánchez, 2005), 2009 (Rodríguez and López-Mota, 2009), 2010 (Gargallo et al., 2010), 2011 (Fernández et al., 2011), 2013 (Briceño and Benarroch, 2013), 2014 (Martínez and González, 2014), 2017 (Maturana and Cáceres, 2017; Urzúa and Rodríguez, 2018), 2018 (Castillo et al., 2018; Pérez et al., 2018) and up to in 2019 (Marroquín and Valverde, 2019; Retana-Alvarado and Vázquez-Bernal, 2019).

The methods used have been mixed (Marroquín and Valverde, 2019; Martínez and González, 2014; Retana-Alvarado and Vázquez-Bernal, 2019), quantitative through surveys (Jiménez and Correa, 2002; Sánchez, 2005), and mainly qualitative (Briceño and Benarroch, 2013; Castillo et al., 2018; Fernández et al., 2011; Gargallo et al., 2010; Maturana and Cáceres, 2017; Pérez et al., 2018; Rodríguez and López-Mota, 2009; Urzúa and Rodríguez, 2018), such as ethnography and the case study, using interviews, questionnaires and observation.

The teachers that have been investigated are primary (Pérez et al., 2018), secondary (Fernández et al., 2011; Maturana and Cáceres, 2017; Rodríguez and López-Mota, 2009), higher level or undergraduate (Briceño and Benarroch , 2013; Gargallo et al., 2010; Jiménez and Correa, 2002; Marroquín and Valverde, 2019; Martínez and González, 2014; Retana-Alvarado and Vázquez-

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Bernal, 2019; Sánchez, 2005; Urzúa and Rodríguez, 2018) and a research professor (Castillo et al., 2018). The concepts investigated were the epistemological and pedagogical. Specifically, conceptions about science, learning, teaching and evaluation.

Regarding the qualitative results on the educational conceptions of the teaching staff, some studies indicate that the least representative are the traditional ones (Jiménez and Correa, 2002). Others reflect that this type of conception is the one with the greatest presence (Briceño and Benarroch, 2013; Sánchez, 2005) and even the one that preserves greater coherence in teachers, this is possibly due to the fact that their propositions are simpler to understand (Pontes et al., 2015) and have a longer time circulating in the teaching imaginary, so they are resistant to change (Retana-Alvarado and Vázquez-Bernal, 2019). Although it is generally accepted that a paradigm shift is complicated because it provides security (Castillo et al., 2018).

Most research, however, indicates that teacher thinking is not always shaped by a single theory or conception but by several, that is, teachers have an eclectic thinking made up of traditionalist, cognitivist, humanist, and constructivist elements (Fernández et al., 2011; Marroquín and Valverde, 2019; Maturana and Cáceres, 2017; Rodríguez and López-Mota, 2009; Sánchez, 2005). Within this continuum of theories, the constructivist is often positioned as the second (Jiménez and Correa, 2002) and third (Fernández et al., 2011) force, despite the fact that many teachers conceptually declare themselves as constructivists (Rodríguez and López- Mota, 2009). This is possibly due to the fact that the constructivist conception has been idealized but has complexity problems when it comes to putting it into practice (Pontes et al., 2015).

The articulation that teachers make between these theories is not always coherent and the limits are often diffuse (Sánchez, 2005). Sometimes it is not the same with respect to the conceptions they claim to use and their observed behaviors in the classroom (Fernández et al., 2011), these being more traditional than what they refer to. Differentiating between epistemological and pedagogical conceptions, it has been found that the latter tend to have more constructivist elements while the epistemological ones are predominantly empiricist (Pérez et al., 2018). A positive correlation has also been found between the empiricist vision of science and the transmission-reception vision of learning, as well as a relationship between the constructivist vision of learning and the declaration of the promotion of competences (Martínez and González, 2014).

It has also been pointed out that teachers' beliefs do not linearly reproduce cultural or scientific theories, but are organized in synthesis that are partial views of these, that is, they do not

passively translate to their minds. Even though teachers have scientific training, they reconstruct their conceptions based on their daily practices (Sánchez, 2005). This synthesis they carry out is also strongly conditioned by the demands of the task (Jiménez and Correa, 2002), their personal experiences and training stories (Briceño and Benarroch, 2013) and by the rules of the discipline in which they were trained (Castillo et al. al., 2018).

Sometimes they have been built alone, by intuition or spontaneously, others have been configured with theoretical support, from the experience of scientific research, the connection with people who are specialists in science who marked their conceptions, the teaching update, or in postgraduate degrees. Sometimes due to moments of failure and crisis in their teaching work that has prompted them to make changes in their teaching practice (Maturana and Cáceres, 2017).

Based on these results, the following has been recommended in the literature. Due to the fact that teachers are immersed in a process of solving educational problems in a practical and situational way rather than scientific and rational, the failure in the attempts to train the teacher is explained solely from theoretical and decontextualized teaching models of their own. practice in the classroom (Díaz-Barriga, 2002). Therefore, it is recommended that teachers receive both theoretical and practical pedagogical training that allows their thinking to be extrapolated to action (Caballero and Bolívar, 2015) and in this sense, a greater link between reflection and action (Retana-Alvarado and Vázquez-Bernal, 2019), through the following phases.

In the first phase, show them the differences between the different learning paradigms, on a theoretical basis (Maturana and Cáceres, 2017). In the second, reflect and make their educational conceptions aware, this requires a meticulous process since accessing the perceptions of individuals is a complex task and they cannot always be verbalized and structured in a simple way (Mellado et al., 2016) , so it will be of vital importance that teachers can make their conceptions explicit (Maturana and Cáceres, 2017; Rodríguez and López-Mota, 2009). Finally, in the third phase, build and implement practical models in accordance with the institutionally desirable scientific or pedagogical paradigms.

Next, organized theoretical material regarding constructivism is presented with the purpose of guiding the first two phases of the proposed process, through a compilation of constructivist principles in school education, which function as guidelines for the daily educational practices of the different actors involved: teachers, pedagogues, educational counselors, students and school administrators, the public interested in education, among others.

The constructivist principles with a pedagogical orientation that will be discussed here are taken from Bruner (cited by Santoianni and Striano, 2006), who grouped in them a set of general ideas present in both the constructivist and contextualist perspectives, with the aim of "delinear un nuevo paradigma de referencia para el diseño de los procesos de aprendizaje/enseñanza en el ámbito educativo" (p. 106). It should be noted that, although there are different types of constructivism and that from their differences there would be nuanced in the way of guiding pedagogical practices, the principles that will be exposed show points of convergence in constructivist approaches.

3.2 Constructivist principles in school education

The well-known phrase *reality is constructed is not found*, is the central approach of the *principle of constructivism*, which states that the knowledge we acquire it is not a copy of the pre-existing reality (Tünnermann, 2011), but rather it is constructed through a dynamic and interactive process in which the information external to an individual is interpreted and reinterpreted by his mind (Serrano and Pons, 2011). Likewise, "no es que la mente se adapte al mundo, sino que este contribuye a dotar de sentido a la propia noción de mente and a cómo la representamos" (F. Hernández, 2003, p. 436).

In this sense, we cannot expect two people to construct their reality on the same object in a similar way, because "desde esta perspectiva se asume que diferentes personas pueden construir diversos significados en relación a un mismo fenómeno" (Sandín, 2003, p. 49). Therefore, there can be as many realities as there are as many minds, because meaning cannot exist without a mind, although of course there are meanings that can be shared, through intersubjectivity or consensus about meaning about something or similar perceptions about the same object (Gaete, 2013).

In the educational field, a teacher with a constructivist orientation could not, for example, expect that all his students describe an object or a phenomenon in the same way, especially if it is something complex. Nor would you expect your students to answer test questions as if they were a copy of the content viewed, to measure their knowledge. Nor would repetition be a strategy present in their classes, because it is not about memorizing information in such a way that this knowledge remains faithful and stable in the students' minds, on the contrary, a strategy would be used that would allow students to had more and more elaborate and complex constructions, this implies that the meanings are changing and this brings us to the second principle: that of *perspective*.

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The *principle of perspective* states that meanings are not stable or have objective consistency, but are always relative to the perspective in which they are interpreted (Arnold, 1997; Niaz, 2001; Santoianni and Striano, 2006). This principle complements the previous one and helps to better understand why knowledge is not a copy of reality, and that is that the interpretation made of reality is subjective and related to individual life stories, to the previous interactions that each one has had with the object in question and the specific context in which its meaning is placed.

In this sense, in the classroom context, when there is a dialogue on a certain topic, there is an encounter of different versions that enter into a negotiation, a process in which the individuals who participate benefit from the different "versiones del mundo que los sujetos forman bajo el influjo de un clima dominante" (Santoianni and Striano, 2006, p. 106). Knowledge is, from constructivism, the result of this process of meeting versions and negotiations. The teacher, therefore, understands that the teaching and learning processes are "flexibles encuentros de perspectivas propuestas por una pluralidad de sujetos" (ibid.) And his job is to provoke this dialogue between versions, instead of always proposing lectures where students they benefit only from their knowledge, through passive listening; nor would it be a moderator to silence the perspectives of some of the students who try to participate in the interaction.

This last point takes us to the *principle of interaction*, for which it is important to consider that "los significados son creados, cuestionados y modificados durante el desarrollo de las prácticas sociales que las personas realizan" (Sandín, 2003, p. 58), is in other words, the negotiation of signifiers implies constant reciprocities (Santoianni and Striano, 2006). Therefore, it is expected that the teacher with a constructivist vision forms true learning communities made up of students committed to their learning processes through interaction.

Learning communities refer to groups of people with different levels of knowledge and experience whose objective is to learn through their constant involvement, commitment and participation in relevant activities for the construction of collective knowledge, that is, they provide each other different types mutual aid (Serrano and Pons, 2011). The concept of learning communities helps us understand the importance of the *principle of outsourcing*, which establishes that "la función de cada actividad cultural es la de producir objetos comunes para volverlos visibles al exterior de la comunidad en que se producen" (Santoianni and Striano, 2006, p. 107).

Through the outsourcing process, different knowledge can be shared, which make the reality present in the minds of individuals public, negotiable and shareable. This implies that students are truly committed to sharing knowledge, which translates into participation in their

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learning community. To achieve this purpose, it is important that students give meaning to the content that is reviewed in class, the activities they carry out, and the established learning goals.

While the attribution of meaning is related to the cognitive component of learning, the attribution of meaning is related to the affective, motivational and intentional component of learning. Both are key pieces of school learning from the constructivist perspective and are directly related to the functionality of the learning, that is, "con la posibilidad de utilizarlos cuando las circunstancias lo aconsejen and lo exijan" (Serrano and Pons, 2011, p. 14). The importance of the attribution of meaning and sense to the contents, the goals, the learning activities and the act of learning itself, are intimately linked to the way in which constructivism conceives the nature and function of education, that is, school education is an instrument (*principle of instrumentalism*) that:

> […] las sociedades utilizan para promover el desarrollo y la socialización de sus miembros, ya que existe el convencimiento de que los individuos más jóvenes requieren una ayuda sistemática and planificada en algunos de esos aspectos, a fin de facilitarles el acceso a un conjunto de saberes and formas culturales que se consideran esenciales para integrarse a la sociedad en la que se encuentran inmersos, de una manera activa, constructiva and crítica (Serrano & Pons, 2011, p. 12).

According to the *principle of instrumentalism*, education is configured as an instrumental process, since it provides skills, rules, ways of thinking, acting, feeling and speaking typical of a cultural and historical context (Delval, 2001; Santoianni and Striano, 2006). Given that the function of the school is for students to integrate and adapt effectively and actively to the society in which they are immersed, the contents, activities and learning goals must be oriented towards such purposes, that is, they must correspond with the set of knowledge and dominant cultural forms, in this way they acquire a greater degree of significance and meaning.

The teacher's interest should not be focused on students learning content arbitrarily, focusing only on reviewing the programmed content as a *checklist*, but should promote that learning is facilitated, through a reflective practice that allows the student determine what knowledge should be used in certain situations, how to use it and when or in what situations (explicit, causal and tacit knowledge, respectively) (Serrano and Pons, 2011). The role of the teacher as facilitator should not be reduced to students having mastery only at the level of knowing (what is it?), But rather that they can recover, integrate and use that knowledge, in specific circumstances.

Finally, two principles linked to conditioning factors of education and learning are reviewed, both at the individual level and at the institutional level, which are presented in the institutional *principle and the principle of limitations*, respectively. The *institutional principle* establishes that, because education is a socioculturally situated process because it assumes institutionalized forms, the educational processes that take place there are conditioned by the organizations and structural configurations of the institutions in which they are developed (Santoianni and Striano, 2006). These conditioning factors are cultural, social and historical and are linked to the dominant culture that permeates a given institution. In this sense, a teacher who teaches the same class in two different institutions will recognize that the differences in context mean that the organization of content, the activities to be developed and the work dynamics are not always effective in both institutions, in addition to the fact that individuals that participate there are qualitatively different. This brings us to the principle of limitations.

The *principle of limitations* describes that the teaching and learning processes must be built considering that the human mind is characterized by intrinsic and peculiar limits (Santoianni and Striano, 2006), linked to biological factors, the experience of each individual, their history of personal life, their access to the repertoire of knowledge, among others. For this reason, through the socialization of knowledge in the learning communities, some limitations of the different people who participate can be overcome, through the different types of mutual support from which the members of said community benefit.

The fact of recognizing that individuals present different types of limitations helps us to create in the school environment, a setting that allows mutual respect, support and collaboration among those who interact in it. This reminds us of the important role that schools play in building the identity and personal self-esteem of students in relation to others.

The constructivist perspective constitutes a set of general ideas that provides us with an explanatory framework not only to understand the educational processes that are generated in formal education, but also to guide pedagogical practices within the classroom. In this sense, a constructivist perspective conceives that people do not become knowledgeable as if it were a copy of reality, but rather build it (*principle of constructivism*) dynamically each time they approach said reality, this implies that these constructions are more elaborate and complex.

Knowledge and reality are socially constructed through the interaction of individuals (the *principle of interaction*), who express, share and make their meanings public in order to produce common objects in a given context and culture (*principle of outsourcing*); These meanings are

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determined by the way in which each individual interprets the same reality, and at the same time is linked to their life stories, their level of experience and previous approaches to that reality. This implies that each person has a different reality compared to another (*perspective principle*), although of course there are shared meanings in situated contexts (for example, at school) configured by institutions and organizations to which educational processes are subject (*institutional principle*).

School education is conditioned by its culture of belonging, its historical and social context, because its main function is to provide skills, ways of thinking and speaking that correspond to other institutionalized activities (the family, politics, the economy, the work, among others) that occur in a specific culture (principle of instrumentalism). It is no less important to mention that a constructivist vision also takes into account the limitations of the human mind in its cognitive, affective and biological modalities (principle of limitations); However, it conceives that through shared activities that take place in a situated context, and in which people are required to participate in an intentional and committed way, individuals can benefit from different types of mutual support that are provided in a process of constant interaction.

Despite the problems regarding its understanding, Miranda (2000) explains that constructivism, by assuming itself as a "model", "method", "paradigm" or "explanatory principle" for education, becomes prescriptive for a field of human activity, going on to guide what should be done from its principles. It should be noted that although constructivism does not attempt to establish written rules or norms for constructivist teaching, it is possible to specify certain principles and recommendations (Bustos, 2002).

4. CONCLUSIONS

Constructivist principles provide a guiding framework for guiding educational practices under theoretical constructivism. However, there is a certain margin of choice and action in the subjects involved, because it is recognized that not all constructivisms are the same. This can be translated into the different ways in which school roles are conceived. However, some basic ways of characterizing these roles and the basic elements of the teaching and learning process are collected:

Teaching, a process that is conceived as a cultural forum, where teachers and learners negotiate, discuss, share and contribute to rebuilding the codes a curricular content in its broadest sense: knowledge, skills, attitudes, norms, among others. From constructivism, teaching is

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methodological and non-linear, supported by the cognitive interaction of the teacher-students, of the students among themselves and of all the members of the classroom, with the thematic contents, objects of teaching and study (Gallego et al., 2004).

Goals of education, designed to promote the development of higher psychological functions, elaborated on the basis of what the culture in particular determines as valuable and relevant for the younger members to learn. These educational processes are not possible without the support of more capable people, whose help and participation are essential, otherwise the appropriation of knowledge that the socio-cultural environment offers would be very difficult.

Student, a social being, product and protagonist of the multiple social interactions in which he is involved throughout his life both at school and after school (outside the classroom). Thanks to the individual's participation in different educational processes supported by different practices social, the apprentice manages to acculturate and socialize, while becoming individualized and developing their own personality.

Teacher, a cultural agent who teaches in a context of socioculturally determined practices and media. Essential mediator between the sociocultural knowledge, the experience and the appropriation processes of the students (Durán, 2014). Through joint and interactive activities, the teacher promotes construction areas for the student to appropriate the knowledge. Therefore, it acts as an agent that facilitates scaffolding for students to overcome personal cognitive development (Tünnermann, 2011).

Scaffolding, system of aids and supports necessary to promote the transfer of control over the management of the contents (skills, concepts, attitudes) by the novice student. In the interactive process on which the teaching is based, the expert-teacher strategically tends a set of scaffolds through which the learner develops the necessary constructions to learn the contents.

Learning, product of situations of guided participation in certain sociocultural practices and contexts that are socially defined. In other words, learning allows access to the culture in which one lives. Learning is an interaction between the teacher's knowledge and that of the student that enters into discussion, opposition and dialogue, to reach a productive and meaningful synthesis (Ortiz, 2015). To arrive at new learning, it is necessary to promote the experience (Moreno, 2014).

Teaching strategies, arrangements that are based on the creation of the zone of proximal development with the students, for certain domains and knowledge activities. These strategies

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should insert the activities that students carry out in a context and in broader objectives so that they make sense and guarantee a continuous link between what is given and what is new.

Evaluation must be of a dynamic type as a different proposal to the traditional static psychometric evaluation scheme. The first one assesses both the products and the processes under development in the student, through a comparison between the level of performance performed by the solo learner and the level of performance achieved thanks to the support of the examiner.

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