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RESEARCH PERSPECTIVES ON LEARNING ENVIRONMENTS IN THE 21ST CENTURY: A VIEW FROM A TRANSBORDER REGION

PERSPECTIVAS DE INVESTIGACIÓN EN TORNO A LOS AMBIENTES DE APRENDIZAJE EN EL SIGLO XXI: UNA VISIÓN DESDE UNA REGIÓN TRANSFRONTERIZA

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Abstract: The current study is based on theoretical sampling and comparative analysis of grounded theory. The text focuses on the significance of learning and skills for the 21st century and educational innovation in a cross-border context. A weak research culture and low research competencies in the academic context are recognized, but the need to develop research skills is highlighted. Research culture is related to basic knowledge, while academic competencies are associated with critical thinking, problem solving, creativity, communication, and collaboration, in correspondence with character qualities. The training of educational personnel in knowledge management is emphasized and the importance of global education, lifelong learning and knowledge management in educational innovation is highlighted. The relevance of digital solutions in education, higher education in transition, emerging learning environments and educational leadership in the context of future skills and digitization in education is highlighted. Finally, research trends that leverage educational innovation processes in the 21st century with the support of learning environments from the perspective of a transborder region are presented.

Keywords: Educational innovation; learning environments; research ideas; transborder region.

Resumen: El presente estudio se basa en el muestreo teórico y el análisis comparativo de la teoría fundamentada. El texto se centra en la importancia del aprendizaje y las habilidades para el siglo XXI y la innovación educativa en un contexto transfronterizo. Se reconoce una débil cultura de investigación y bajas competencias investigativas en el contexto académico, pero se destaca la necesidad de desarrollar habilidades para la investigación. La

cultura investigativa se relaciona con conocimientos básicos, mientras que las competencias académicas se asocian con pensamiento crítico, resolución de problemas, creatividad, comunicación y colaboración, en correspondencia con las cualidades de carácter. Se enfatiza la formación del personal educativo en gestión del conocimiento y se destaca la importancia de la educación global, la formación a lo largo de la vida y la gestión del conocimiento en la innovación educativa. Se subraya la relevancia de las soluciones digitales en educación, la educación superior en transición, los ambientes de aprendizaje emergentes y el liderazgo educativo en el contexto de las habilidades futuras y la digitalización en la educación. Finalmente, se presentan las tendencias investigativas que apalancan los procesos de innovación educativa con el apoyo de ambientes de aprendizaje en el marco de una región transfronteriza.

Palabras clave: Innovación educativa; ambientes de aprendizaje; situaciones a investigar; región transfronteriza.

1. INTRODUCTION

Socio-cultural constructivism relates to learning, as a process, with a human act oriented to cognitive development, with relevant interrelationships between the actors of the process through psychological devices that the person learning locates in its social context (García, 2010). Therefore, in educational systems at all levels and contexts, the strengthening of actors and their preparation for the cognitive act with the support of such tools must correspond to the strategic core of classroom management as an institutional guideline, as a result of curriculum designs and training plans for talent or human capital.

The process based on the socio-cultural particularities of the learning subject constitutes the main axis of the socio-cultural constructivism proposed as a theory by Vygotsky (1978). The tools that expand mental skills such as attention, memory, concentration, among others, allow to involve the subject who learns in the incorporated practical activity, with different levels of complexity, in their own way of being, of thinking and feeling through words, assumed these, as structuring elements of conceptual representations. The Theory establishes that the lack of such instruments, devices or tools negatively impacts the capacity of abstraction that from early childhood the human being can reach.

Vygotsky's theoretical approaches consider a relevant set of concepts that support his theoretical positions, among which psychological tools, mediation and internalization stand out. Internalization is a process that uses tools and signs to transform social phenomena into psychological phenomena (Pozo, 2006), is the psycho-epistemological element that gave rise to Vygotsky's neuropsychological theory known as the Near Development Zone (ZDP), which according to Miller (2003) understands an effective route to the development of the person who learns in the context of the learning theory (Acosta Rodríguez, 2013).

The ZDP is defined as the gap or space that can be identified, for each subject who learns, by comparing the skills previously acquired and those that can reach in a learning environment guided by a subject who teaches, which establishes that the person learns by induction processes, directed by third parties. However, Birenbaum (2003) highlights the logical argument that, from any constructivist perspective, knowledge is actively built by the student. In any case, the foundations of partner constructivism establish that instructors should create collaborative learning environments focused on the student that aim at the development of critical thinking and experience-based learning (Blumenfeld, 1992).

This leads to the prevailing consideration that the socio constructivism is the guarantor of educational innovation as a process that promotes transformations in the dynamics of the educational ecosystem and school culture according to context, needs, diversity and interests (Villarruel-Fuentes, 2012). Guzmán Acuña y Guzmán Acuña (2009: 17), on the basis of Nichols (1983) stated that "educational innovation is defined as ideas, objects or practices perceived as new by an individual or individuals who try to introduce improvements in

relation to the desired objectives". Learning environments then inspire educational innovation for the training of local citizens with skills to deal with contextualized situations.

In the context of the department of Norte de Santander in Colombia, it is necessary to think about how to build cross-border citizenship since building citizenship and understanding the dynamics of the border are issues, whose study, allow to reveal parameters that will have a wide implication in the definition of the structuring elements of the teaching-learning process (Guzmán Mendoza y Trejos, 2017). whereas, in socio-cultural constructivism, the borders cross the citizens and not the other way round, since it distinguishes the existence, in addition to geographical borders, of frontiers of power, generational, educational, political and cultural, social, religious, patriarchal, rural, environmental, natural, aesthetic, orientations and expressions of gender, racial, sexual, ideological, ableists, economic, among others, establishes the cross-border character to citizenship (Barajas y Aguilar, 2013).

The intrinsic relationship between innovation and science is no exception in the field of education. Doing science is related to the processes of knowledge generation; knowledge can be changed, refuted, evolved, excluded, updated, and innovation has to do with change, evolution, updating. In this sense, it is necessary to detect the situations, ideas or events present in the educational environment, related to learning environments, susceptible to be investigated. This article aims to describe the situations to be investigated that arise in the context of learning environments in the cross-border region of Norte de Santander, Colombia. Such a description will establish the point of view from which knowledge management for innovation in the educational field is analyzed from the learning environments in the region.

2. METODOLOGY

The approximation or approach to learning environments as an object of study that supports this article is carried out through a qualitative study, with field design and descriptive level (Hernández et al., 2010) with the aim of revealing the situations or ideas to be investigated about the learning environments in the context of a cross-border region for the present century. Action research is considered as a scientific method "to account for the relationship between being, knowing and doing, as one that offers an alternative comprehensive explanation of reality and, in addition, a proposal for transformation and optimization of that (Hernández et al., 2022, p. 19), to guide the structuring of the proposed cross-border perspective, with broad adjustment to reality through spatial and temporal observation of the importance of learning environments in educational innovation, provides a system of categorizations that starts, from the theoretical framework, to the approach to the object of study, in which are established, as can be seen in Table 1, two (2) units of analysis relating to, learning and skills for the 21st century (Karaca-Atik et al. 2023) and educational innovation (Guzmán Acuña y Guzmán Acuña, 2009).

The category system shown in Table 1 is used to construct an information gathering instrument whose sentences or reagents, associated with the subcategories of the initial categorization system, allows establishing research perspectives around learning environments in the 21st century in Norte de Santander as a cross-border region. The interview is considered as a procedure for collecting information specified in the instrument designed from the initial category system. The study units correspond to a total of nineteen (19) professionals who work in the educational context and who participate in the Master's Degree in Learning Environments of the Minuto de Dios University Corporation in San José de Cúcuta. The interview allows to obtain, through the conversation between the researchers and each informant, qualitative expository and propositional information adjusted to the reality perceived by each academic actor (Ander-Egg, 1995).

Table 1: Initial categorization system

Units of analysis	Categories of observation	Subcategories
Learning and skills for the 21st century	Basic knowledge	- Scientific culture - Reading comprehension - Mathematical thinking - Knowledge of information and

		communication technologies - Financial education - Culture and citizenship
	Competences	- Critical thinking - Problem solving - Creativity - Communicating - Collaboration
	Qualities of character	- Curiosity - Initiative -Persistence/ determination - Adaptability - Leadership Socio-cultural awareness
Educational innovation	Educational innovations and changes in learning paradigms	- Global education - Knowledge management -Lifelong learning
	Professional development	- Vocational training - Career guidance throughout life - Training in research skills
	Future skills and digitization in education	- Digital solutions in education - Higher education in transition - Emerging learning environments - Educational leadership

The formal recording in audio recordings of the exchange between the actors of the interviews allows a content analysis based on critical listening, aimed at extracting data from the interviews for each initial subcategory studied, which are associated with codes that identify and conceptualize what is expressed by the informants regarding each subcategory, from the contributions of the grounded theory (Corbin y Strauss, 2007), trying to make a theoretical-methodological reading aimed at "finding the imprint in the methodological version, focusing the characteristic of the qualitative not on the different types of data, but on the process of transformation that causes this qualitative look" (Trinidad et al., 2006, p.10). Such codes are then grouped in order to construct emergent categories, which are analyzed from their nature which in turn allows to establish the set of emergent subcategories which culminates with the process of interpretation.

The cross-border nature with which the Norte de Santander department is related is due to the inter- and intra-territorial synergies associated with the history and social, cultural and economic behaviors of a border region, clearly geo-referenced, with the Venezuelan State. Ramírez Martínez (2017) very clearly when he says:

> The border municipalities on the Colombian and Venezuelan side face similar situations, a product of their historical social, political, economic and cultural dynamics that, far from being considered borderline, has led them to develop such an interaction, which prolongs lifestyles to such an extent that it could be considered a territorial subregion.

All of this directs the present research towards investigating the need to promote learning environments in which children and adolescents strengthen inclusive thinking, pluralistic, respectful of rights and nature, in which discrimination or undervaluation of the being is mitigated. Such places of enunciation must be oriented to the transformation of the realities of the Department, through the effective recognition of transboundary, to leverage the development of the person learning in this complex context.

The brief must be accompanied by a summary in Spanish and English that does not exceed 150 words. It is recommended that the study indicate the purposes of the study or research, the basic procedures used, the main findings and conclusions of the article. They should be presented and identified as such between 3 to 5 keywords in Spanish and English.

3. RESULTS AND DISCUSSION

From the position established by Sandoval (2002) concerning theoretical sampling and comparative analysis of grounded theory, which requires, the first, the acquisition of data from the interpretation of the stories obtained from the intersubjective dialogue managed with the support of the information collection instruments, and the second, the detection of conceptual variations or categories of emerging analysis (Vegas-Melendez, 2016), the results obtained in this study are presented in this section.

The participants or study units, in their totality, recognize the weak research culture in the academic context, also express their consideration in terms of the low research competences that some consider to have, however, highlight the need to generate skills for the capture of ideas and further development of research projects, to strengthen the skills of reading and writing academic texts, strengthening of the ability to tutor academic works, knowledge of various methods for structuring projects, and motivation towards the creation of research seedbeds for the incorporation of students into research work, among other related objectives.

The above suggests that, research culture should be explained from the initial subcategories: reading comprehension, mathematical thinking, knowledge in information and communication technologies, financial education, and culture and civics, to meet the needs associated with the basic knowledge base for learning and skills for the 21st century. On the other hand, by addressing theoretical sampling and comparative analysis around competences for learning and skills in this century, in terms of critical thinking, problem solving, creativity, communication and collaboration, the creation of intellectual capital with attitudinal skills and aptitude for the development of the life projects of the learners is highlighted as key, which interrelates competences with character qualities as categories of observation, since all subcategories of character qualities have a close correspondence with the socio-emotional skills demanded today and emphasized by the pandemic by the Covid-19 (Montalvo Nieto and Jaramillo Zambrano, 2022).

In this sense, it is recognized the need to train the human talent in charge of guiding the subject who learns in the educational context and to strengthen training around knowledge management, all this leveraged by educational innovation since the complete evolution of students and their future path are linked to the renewal in education, which is conceived as a procedure that emerges from the creation or adjustment of concepts, tactics, knowledge, approaches or products, which generate changes in the functioning of the educational community and the school atmosphere depending on the environment, demands, plurality and desires.

Global education, knowledge management and lifelong learning are catalysts for educational innovations as they aim to transform learning paradigms in a constantly evolving world. Global education transcends borders and cultures, promoting intercultural understanding and diversity of perspectives, essential for addressing global challenges. Knowledge management involves the collection, organization and efficient distribution of valuable information, which facilitates the adaptation of educational institutions to new trends and technologies. Finally, lifelong learning ensures that individuals can stay up to date and acquire new skills as changing opportunities and demands arise in the labour market. Together, these three subcategories foster a mindset of constant learning, vital to driving innovation in education and progress in society.

Professional development oriented to educational innovation based on the study units is interconnected by the three subcategories promoted in the initial categorization system as follows: vocational training provides the foundation of knowledge and skills needed to enter a specific profession or field. In the context of educational innovation, vocational training may include the acquisition of pedagogical, technical or managerial skills relevant to the improvement of teaching and learning processes. As for lifelong career guidance, it involves continuous career planning and career development as the goals and conditions of the labour market evolve. In education, this means that professionals must be willing to adapt and constantly update themselves, exploring new opportunities and approaches in educational innovation. And with respect to research competencies, they are essential for educational innovation since training in research competencies allows professionals to identify problems, design solutions and measure the impact of innovations on learning. These subcategories create a continuous and enriching professional development cycle that

fuels educational innovation. Professionals who undergo solid professional training, supplemented by research skills and lifelong career guidance, are better equipped to lead and participate in innovative initiatives that transform teaching and learning, thus promoting quality education, relevant to the changing needs of society.

From the process of interpreting the stories associated with the participants in this study, future skills and digitization in education are understood as an interconnected fabric of advances that redefines the way in which we learn for the future. Digital education solutions, such as online platforms and collaborative tools, act as catalysts, enabling flexible and accessible learning experiences while nurturing critical digital skills. In full transition to online and blended learning, higher education offers students a globalized and adaptable education that allows them to face the challenges of a constantly changing world. By being personalized and student-centered, emerging learning environments cultivate essential skills for the future, such as critical thinking and collaboration. Educational leadership, in turn, drives this transformation, driving technology adoption and fostering a culture of continuous learning, ensuring that future skills are the cornerstone of 21st century education.

4. CONCLUSIONS

From the study carried out, evidenced from the stories that educational innovation establishes to a large extent the direction of the continuous improvement of processes in the educational context through the configuration and organization of learning activities from essential perspectives in the context of governance and governance such as public policies, institutional arrangements, curricular autonomy and professional practice. These processes of continuous improvement from the disciplinary perspective of the education sciences are driven by the learning sciences, cognitive research and educational practices, however, they require transversal support from the assertive training of human talent, information and communication technologies and current educational policies. Educational innovation promotes, on the basis of innovative learning environments, the acquisition of competences and skills for the 21st century, fully oriented in a cross-border region by global education with the aim of transcending both borders and culture, promoting intercultural understanding and respecting the diversity of perspectives with which learners, from the cross-border nature of their citizenship, observe the challenges in a glocal context. It is also evident from the study that the interests expressed by the units of study in terms of research perspectives in the context of learning environments are focused on:

- Innovative learning environments for random thinking;
- Significant learning environment to consolidate motivation in underperforming students;
- Promotion of the teaching role in inclusive learning environments;
- Learning and entrepreneurship environment for sustainable development;
- Learning environment for reading comprehension and production of written texts;
- Socio-emotional training in socio-emotional skills;
- Learning environment for cognitive development from critical thinking;
- Learning environment for the development of emotional intelligence from complex thinking;
- STEM+ educational approach;
- Virtual learning environments.

All these research trends that leverage educational innovation processes in the 21st century, from the perspective of a cross-border region, with support from learning environments, are plotted with the help of the semantic network shown in Figure 1. Such representation exposes the strategic character of educational innovation as an essential element for the continuous improvement of the quality of the processes constituted in the educational ecosystem of the department of Norte de Santander and in general of Colombia, and projects the direction to be taken by the research processes that must be addressed to propel the educational innovation required for the development of effective learning environments, efficient and effective that positively impact the educational quality in this border region.

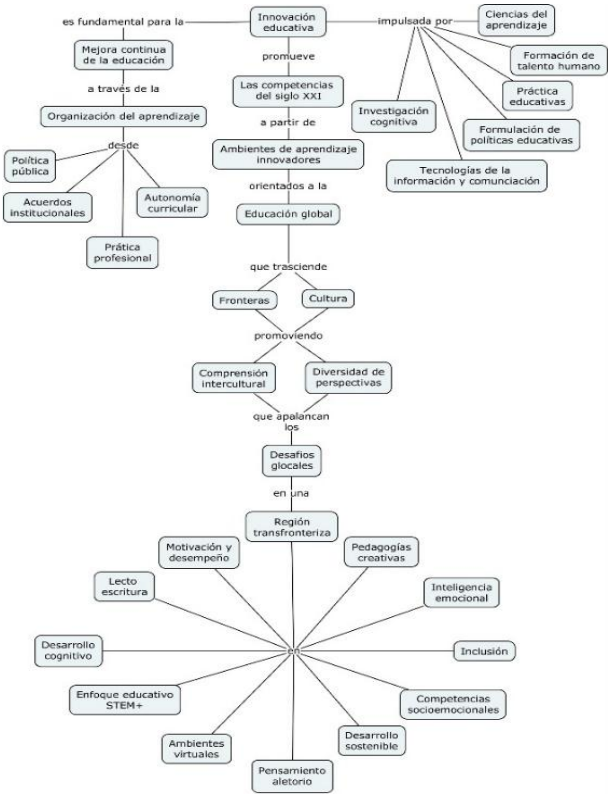

Fig. 1. Research perspectives on learning environments in the 21st century

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