Motivational pedagogical potential of Information and Communication Technologies in basic secondary education: An alternative to strengthen attention-concentration in post-pandemic times.

Potencial pedagógico motivacional de las Tecnologías de Información y Comunicación en la educación básica secundaria: Alternativa para fortalecer la atención – concentración en tiempos de postpandemia

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Abstract

This article presents the results of a study entitled Strengthening attention-concentration in high school students through the use of ICT. Its purpose is to show the pedagogical-motivational potential of these tools linked to attention-concentration, based on an action-research experience where attention-concentration problems were diagnosed, which were intervened through the application of three

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(3) workshops to an intentional sample of ten (10) students belonging to the IED Mayor de Barranquilla and the Caribbean, Colombia. The results revealed that, once the interests of the group were aligned with the pedagogical purposes of technological mediation, the students improved their attention - concentration; they were able to be enthusiastic, participate in a disciplined manner; produce and socialize content on websites and social networks with reflective messages alluding to the importance of ICT as a tool favorable to the consolidation of this skill. It is concluded that ICTs are an effective tool to consolidate attention-concentration as a determining skill in student academic performance.

Keywords: social isolation; education, COVID-19; pandemic, post-pandemic, ICT.

Resumen

En el presente artículo se dan a conocer los resultados de un estudio intitulado Fortalecimiento de la Atención–concentración en estudiantes de secundaria mediante el uso de las (TIC). Tiene como propósito dar a conocer el potencial pedagógico – motivacional de estas herramientas vinculado a la atención – concentración, a partir de una experiencia de investigación – acción donde se diagnosticaron problemas de atención concentración, los cuales fueron intervenidos mediante la aplicación de tres (3) talleres a una muestra intencional de diez (10) estudiantes pertenecientes a la institución IED Mayor de Barranquilla y el Caribe, Colombia. Los resultados develaron que, una vez alineados los intereses del grupo con los fines pedagógicos de la mediación tecnológica, las estudiantes mejoraron su atención - concentración; fueron capaces de entusiasmarse, participar de manera disciplinada; producir y socializar contenidos en sitios web y redes sociales con mensajes reflexivos alusivos a la importancia de las TIC como herramienta favorable a la consolidación de esta habilidad. Se concluye que las TIC son una herramienta efectiva para consolidar la atención – concentración como habilidad determinante en rendimiento académico estudiantil.

Palabras clave: Aislamiento social; educación, COVID-19; pandemia, postpandemia, TIC.

Introduction

The pandemic of 2020, caused by the COVID-19 virus, caused a great impact worldwide, generating chaos and uncertainty in all sectors of society. The education sector was no exception; isolation and virtuality have marked a milestone in the history of education, changing the ways of relating and even of seeing life. The academic effects of COVID 19 altered the dynamics of education worldwide.

In the Colombian context, the then President of the Republic, Iván Duque Márquez, issued decree number 847 of 2020, which modifies Decree 749 of May 28, 2020, to give instructions under the sanitary emergency. The pronouncement of other ministries was not long in coming. The Colombian Ministry of Health decrees social isolation. Decisions are made to defend educational programs, plans and projects; the Departmental Health Secretaries, together with the Ministry of National Education, with Circular No. 00021 of March 26, 2020, ordered that the social interaction of students be only through virtual media. Colombian children and young people, who were studying face-to-face, had to adapt to distance education (Ministry of National Education-MEN, S.F, 2017).

Virtual learning environments are used to guarantee the right to education for children, young people and adults. Every home becomes a classroom. The new virtues of virtual education allow students to access their classes and academic commitments online. The teacher-student relationship, in terms of dialogues and transmission of experience and learning were conditioned by virtuality, to a computer or a smart phone.

However, despite the efforts made by educational and health authorities to create political conditions to face the emergency, Colombian educational institutions (public and private) are not prepared. Schools lack technological tools to guarantee virtual or distance education that meets quality standards.

The alteration of conventional school discipline, characterized by attendance, rigid schedules, traditional classes, memorization and reproduction of content, was not long in coming. On the other hand, the leisure and unmediated use of ICTs experienced during the two years of the pandemic, awakens new interests, styles and ways of learning in students, making their motives revolve around the possibilities that these tools provide for communication; access to all

kinds of information through texts, images, videos, games, social networks, among others.

In this scenario, scientists and pedagogues recognize ICT as a valuable resource to improve educational quality due to its pedagogical-motivational potential. New educational challenges arise; and with them the demand to reconfigure education to adapt to the post pandemic period considering new ways of generating knowledge through mediation, a rethinking of traditional teaching strategies, the use and pedagogical benefit of Information and Communication Technologies (ICT) and the development of information processing skills.

However, some teachers are resistant to developing mediation processes adapted to the new educational reality, which means that in the mediation processes developed by these actors, the needs, characteristics and new interests of the students are not considered when planning and developing their classes. The resistance to change of some mediators makes students show little interest in the classes; the lack of attention and concentration in the teaching and learning processes is evident. In addition to the above, there are psychological pathologies developed by some students due to lack of guidance on the correct use of ICTs, including technodependence and pornodependence.

This affected the development of basic learning skills such as reading comprehension and meaningful learning, resulting in low academic performance, school dropout and failure to comply with educational quality standards.

In view of this scenario, the authors conducted a study to intervene in the reality described above, entitled Strengthening Attention-Concentration in high school students through the use of ICTs, with the following objectives:

Once the action research has been developed, the following question arises: what is the motivational pedagogical potential of Information Communication Technologies (ICT) linked to attention-concentration? This article answers this question by making known the pedagogical-motivational potential of these tools linked to attention-concentration, based on the results of the aforementioned action-research experience.

Constructivism represents a current of pedagogical thought that conceives learning as a process of intersubjective construction

resulting from the interpretation and reinterpretation of the human mind. Thus, the objects, laws and phenomena observed in reality are not independent of the observers. The constructivist philosophy establishes that reality is constructed by means of representations of internal experience, therefore, it does not admit the existence of objective knowledge (González, 1995).

It should be noted that constructivism has epistemological, psychological and pedagogical sources. Among its epistemological sources, radical constructivism (Maturana, Von Foester, Watzlawick) and critical constructivism (Popper, Bachelard, Kuhn and Lorenz) stand out. Its psychological sources refer to Ausubel's cognitive assimilation, information processing psychology (Rumelhart and Norman's visions); Piaget's genetic psychology and Vygotsky's cultural psychology.

The benefits that this current of thought has brought to the scientific community in the educational field refer to the promotion of a democratic culture where students and teachers have the possibility of interacting and contributing to the construction of knowledge. Now, in the context of a globalized society governed by Information and Communication Technologies (ICT), constructivist thinking makes sense in the articulation with contemporary knowledge about the interests of children, young people and adults; and its pedagogical, psychological and sociocultural dimensions (González, 1995).

It should be noted that ICTs represent the set of "resources, tools, equipment, computer programs, applications, networks and media that allow the compilation, processing, storage and transmission of information through voice, data, text, video and images" (Tecnólogy, 2022). These tools facilitate the materialization of constructivist thinking by offering the possibility of interacting, processing, storing, retrieving and sharing information without time and space limitations. This is due to the benefits they offer in terms of the technological advances brought about by information technology, telecommunications and audiovisual technologies (Yuni and Urbano, 2005).

Indeed, according to UNESCO (2022, p. 1) ICTs can facilitate "... universal access to education, reduce learning gaps, support teacher development, improve the quality and relevance of learning, strengthen inclusion and improve educational management and

administration". Undoubtedly, ICTs favor the application of constructivist principles that make possible the management of knowledge from a democratic perspective.

Connectivism represents a learning theory with a systemic approach that explains educational processes in the digital era (Siemens, 2004). It emerges in the global context with new educational scenarios where technology in education plays a fundamental role. Indeed, according to Fenwick, quoted by Gutiérrez (2012), the phenomenon of globalization, in addition to transforming the way of doing business, the nature of services and the meaning of time at work, has impacted learning processes.

Its creator, George Siemens, argues that the classical learning theories (behaviorism, cognitivism and constructivism) have limitations to respond to the educational demand of the digital era, since they were proposed in a period where technology had not impacted learning by influencing the acceleration of knowledge. Thus, for the aforementioned author, the act of learning is not an isolated experience, but an action where knowledge nodes are combined and connected; where effective decisions are made based on the analysis of different and contradictory opinions derived from a wide range of points of view. Connectivism proposes the following principles,

- Learning and knowledge are found in the diversity of opinions.
- Learning is conceived as a process of specialized connection of nodes or sources of information.
- Learning can reside in non-human artifacts.
- The ability to know more is more important than what is known at a given moment.
- Facilitating continuous learning requires nurturing and maintaining connections.
- The ability to identify connections between areas, ideas and concepts is essential.
- Decision-making is a learning process in itself.
- -Selecting what to learn and the meaning of incoming information is viewed through the lens of a changing reality.

These principles underpin the application of ICTs in educational contexts and show that they are fundamental tools for learning and mediating learning in the digital era. Indeed, for Giesbercht (2007) Connectivism is based on the establishment of connections where students extend their learning practices beyond the classroom to

open up to real life experiences. This makes education a holistic and integral process that demands a balance between the needs of learners and institutional needs.

Meaningful learning is one of the theories linked to the constructivist current of thought. It was created by David P. Ausubel in 1963 as a reaction to the prevailing behaviorism. For Ausubel, learning is a process by which new information is related to the cognitive structure of the learner in a non-arbitrary and substantive (non-linear) way (Rodríguez, 2011).

This theory proposes a teaching-learning model based on discovery that privileges activism (Ausubel, 1979, 2022). In this theory, learning is determined by the student's previous cognitive structure and his or her capacity to associate it with new information. It should be noted that a cognitive structure is conceived as the set of concepts and ideas that a person possesses in a given field of knowledge. (Ausubel, 1979, 2022).

In fact, motivation is essential to generate an adequate classroom climate and to interest students in their work; the medium as a resource; creativity, which enhances imagination and intelligence; the concept map, a tool that relates concepts and curricular adaptation (Ballester 2002, 2008).

ICTs have the potential to attract students' attention, generating a climate of cooperation, collaboration and group interaction, all of which are favorable to the development of meaningful learning, since they help students to relate new information to their cognitive structure or previous knowledge.

Materials and methods

The article reports results derived from an action-research experience framed in the sociocritical paradigm, qualitative approach, where concentration attention problems were diagnosed, which were intervened through the application of three (3) workshops to an intentional sample of ten (10) ninth grade students belonging to the IED Mayor de Barranquilla y el Caribe institution, Colombia. Documentary analysis was used as a technique for data collection with the support of a documentary analysis matrix. After analyzing the results from a critical perspective, these are made

known to the scientific community through the publication of this article.

Results

Once the interests of the group were aligned with the pedagogical purposes of technological mediation, the students selected as an intentional sample in this study were able to become enthusiastic, participate in a disciplined manner, produce and socialize content on websites and social networks with reflective messages about the importance of ICT as a tool to consolidate attention and concentration.

These achievements validate the postulates of social constructivism and meaningful learning of Vigotsky and Ausubel, who emphasize that learning is the product of an inter-subjective construction. Likewise, they also emphasize the importance of motivation to generate an adequate classroom climate and to interest students in their work (Ballester 2002, 2008). Indeed, the group studied was motivated due to the potentially significant material offered by the technologies, allowing them to anchor their previous knowledge to the new information incorporated into their cognitive structure.

In the words of Lev Vygotsky (Historical - cultural theory of psychology; philo - ontogenetic evolution) what happened is evidence of an internalization of culture, where technological mediation played a fundamental role, relating the zone of current development with the zone of proximal development (Falieres and Antolín, 2007).

In the light of Ausubel's theoretical postulates (meaningful learning), what happened represents the consequence of the motivational effect caused by the use of ICT (highly significant material) that facilitated the anchoring of new information incorporated into the cognitive structure for the generation of new knowledge.

Furthermore, in communion with the above, the motivational effect observed can be explained from neuroeducation and the autonomous learning approach, associated with metacognition as the ability to reflect on one's own knowledge processes and products, under a mediation that manages to develop in them the interest in learning; this was evident in the reflections published by the students regarding their knowledge processes and products.

With regard to neuroeducation, this new science explains that educational processes are intimately associated with emotions, since no one learns what he dislikes or does not want to learn, some summarize the above by stating that education is emotion. In fact, the group studied initially showed resistance to the proposed activities, then, upon discovering that they were aligned with their interests, they showed enthusiasm and commitment, attending and concentrating on the proposed pedagogical actions (Falieres and Antolín, 2007).

On the other hand, the achievements reached in these workshops confirm the postulates of Cabero (2004); Abogadro, Quiroga and Ricardo, (2015), who agree in pointing out that ICT are technological tools on which students show great interest due to the variety of options and functions they offer in order to communication and social interaction, therefore, their potential represents an attraction to achieve optimal student performance.

The aforementioned authors also agree in differentiating between the use of ICTs and learning with ICTs, as expressed by Connectivism (Siemens, 2004). This differentiation was noticed by the group of students attended. This is demonstrated by the reflections expressed in the workshops conducted, where they were able to publish on social networks and websites information related to the topic and their learning experience. Indeed, during the pandemic period, even when they received orientation guides, they did not have the necessary guidance to take pedagogical advantage of these resources.

Discussion

ICTs have a great pedagogical potential to consolidate the cognitive and social skills demanded by the digital society and teachers are aware of this. Attention - concentration affects the development of memory and comprehension; fundamental cognitive skills for the production - socialization of digital content. The positive results of this study demonstrate the pedagogical potential of ICT for the consolidation of one of the fundamental cognitive skills such as attention - concentration. The benefit of the benefits of these technologies is linked to variables such as teachers' abilities to exercise technological mediation; their commitment to education

and the clarity they have about the pedagogical potential of these technologies for the development of cognitive and social skills demanded by the digital society.

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