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REVIEW

Transformative education: from written language to digital learning in times of change

Educación transformadora: del lenguaje escrito al aprendizaje digital en tiempos de cambio

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ABSTRACT

Introduction: the research addressed the importance of literacy in students' cognitive development, considering its historical evolution from the first writing systems to current ICT-mediated teaching models. It highlighted that language has been essential for transmitting knowledge and developing critical thinking. The study focused on a rural public institution in Ecuador, where a pedagogical methodology supported by digital tools was proposed to enhance language skills.
Development: throughout the study, the contributions of great educators such as Socrates, Piaget, Montessori, and Vygotsky were reviewed, who transformed the concept of education from traditional models to active and participatory approaches. It was shown how literacy has been a key tool in the intellectual development of human beings. In addition, the impact of ICT during the COVID-19 pandemic was analyzed, a situation that forced migration to virtual environments, revealing both opportunities and inequalities. In this context, digital platforms, ubiquitous learning, and strategies such as PBL (Project-Based Learning) were implemented to improve teaching processes in vulnerable areas.
Conclusions: the study concluded that strengthening literacy through innovative methodologies and the conscious use of ICT improved students' academic and cognitive performance. However, the need for effective teacher support and family involvement was emphasized. Committing to inclusive, contextualized, and critical education was established as the path toward real and equitable educational transformation.

Keywords: Literacy; Cognitive Development; ICT; Rural Education; Innovative Methodologies.

RESUMEN

Introducción: la investigación abordó la importancia de la lectoescritura en el desarrollo cognitivo de los estudiantes, considerando su evolución histórica desde los primeros sistemas de escritura hasta los actuales modelos de enseñanza mediados por las TIC. Se destacó que el lenguaje ha sido esencial para transmitir conocimientos y desarrollar el pensamiento crítico. El estudio se centró en una institución pública rural del Ecuador, donde se propuso una metodología pedagógica apoyada en herramientas digitales para potenciar habilidades lingüísticas.
Desarrollo: a lo largo del trabajo se revisaron los aportes de grandes pedagogos como Sócrates, Piaget, Montessori y Vygotsky, quienes transformaron la concepción de la educación desde modelos tradicionales hacia enfoques activos y participativos. Se evidenció cómo la lectoescritura ha sido una herramienta clave en el desarrollo intelectual del ser humano. Además, se analizó el impacto de las TIC durante la pandemia del COVID-19, situación que obligó a la migración hacia entornos virtuales, revelando tanto oportunidades como

desigualdades. En este contexto, se implementaron plataformas digitales, aprendizaje ubicuo y estrategias como el ABP (Aprendizaje Basado en Proyectos) para mejorar los procesos de enseñanza en zonas vulnerables. **Conclusiones:** el estudio concluyó que fortalecer la lectoescritura mediante metodologías innovadoras y el uso consciente de las TIC mejoró el rendimiento académico y cognitivo de los estudiantes. Sin embargo, se subrayó la necesidad de un acompañamiento docente efectivo y el involucramiento familiar. Apostar por una educación inclusiva, contextualizada y crítica se estableció como el camino hacia una transformación educativa real y equitativa.

Palabras clave: Lectoescritura; Desarrollo Cognitivo; TIC; Educación Rural; Metodologías Innovadoras.

INTRODUCTION

Education has been a central component in the development of societies since ancient times. Throughout history, human beings have sought various ways of communicating, teaching, and learning, leaving evidence ranging from cave art to the development of complex writing systems. These advances have enabled the consolidation of two essential processes in the field of education: reading and writing, as well as cognitive development. Both are fundamental pillars in the integral education of students, as they not only allow them to acquire knowledge but also to express ideas, solve problems, and develop their critical thinking.

This paper focuses on the analysis of literacy as a key tool for strengthening cognitive development, addressing its evolution from the first alphabets to current teaching models mediated by technology. It considers the influence of great pedagogues such as Socrates, Plato, Vygotsky, Piaget, Montessori, and Freinet, among others, whose theories and approaches have transformed the way education is conceived, contributing to the understanding of the learning process as an active, social and contextualized construction.

It also examines the impact that Information and Communication Technologies (ICTs) have had on education, particularly in the wake of the COVID-19 pandemic, which compelled institutions to adapt to virtual learning environments rapidly. This phenomenon highlighted inequalities but also opened up opportunities for innovation in pedagogical methods, paving the way for ubiquitous learning (U-learning), the use of educational platforms, and the strengthening of digital competencies in both teachers and students.

The study is situated within the Ecuadorian education system, with a focus on a rural public institution, where the aim is to implement a pedagogical proposal that leverages digital tools to enhance reading and writing processes. It is based on the premise that the appropriate use of ICT can improve students' linguistic and cognitive skills, provided they are accompanied by the teacher and supported by the family environment.

Objective

To highlight the importance of literacy in cognitive development and to demonstrate how innovative methodologies can transform educational challenges into genuine learning opportunities.

DEVELOPMENT

Theoretical framework

Origin of alphabet and writing

The variables examined in this study are literacy and cognitive development, which have been emphasized in all educational processes from humanism to the present day, with variations according to the era, but with the aim of better empowering students in terms of academic knowledge and the development of their cognitive abilities.

Since prehistoric times, it is evident through vestiges that human beings have wanted to express themselves not only through speech, gestures, and cries but also through their way of life, which is reflected in their exposure to multiple caves. Lascaux (France) and Altamira (Spain) are currently cultural heritage of humanity; this type of art is known as cave art, was developed by the first inhabitants of the world millions of years ago on the walls of the rocks, almost always inside the caves and shelters.[1]

With the passage of time and the evolution of humanity, education became a necessity for human beings. In one of the world's earliest civilizations, they developed various forms of writing. The Sumerian pictograms, dating back to 3100 BC, are the oldest vestiges found by archaeologists in the 19th century. This type of writing was identified as being made with clay. Later, in Mesopotamia, its meanings were modified, and cuneiform writing was born, allowing humans to express their knowledge.

The ideograms or hieroglyphs created in the Egyptian civilization, combined with the invention of papyrus, made it possible to have flexible and durable writing that has lasted in great museums and throughout this civilization. The Greek civilization from 1200 to 146 B.C. already had its alphabet, and the upper social class

was the only one who had the right to read and write; it had twenty-four letters, and this country is called the cradle of civilization because of its contributions to modern science. The Greeks have contributed their knowledge in various branches, including science and philosophy. They also added to our culture the alphabet, mathematics, and myths, as well as influencing the fields of politics and education.

To speak of the Roman alphabet is to approach the current writing, but this type of writing was adapted from the Greek alphabet. This alphabet was also similar to that of the Phoenicians, who, in turn, modified the Sumerian alphabet. Writing has been used since its inception to represent a means of expressing oneself at different times, utilizing drawings, strokes, or letters that identify a particular civilization.

Today, there are various languages spoken worldwide, and each country typically uses an alphabet corresponding to its native language. Among the most widely used globally, we have the Cyrillic alphabet, which is inspired by the Greek alphabet. Devanagari is used by approximately 420 million users across 120 languages and originates from India and Nepal. The Arabic alphabet is one of the most widely used alphabets in the world, with approximately 660 million people writing and understanding it. The Latin alphabet has approximately 4,9 billion users worldwide.

He states that Mandarin Chinese is the most widely spoken language in the world, with 1,5 billion speakers.

A look at great teachers and their legacy for the benefit of education

Within the researched topic, the influence of the use of digital platforms in reading and writing for the cognitive development of students, different methodologies of different pedagogues in each era are evidenced; for Socrates, the teacher and his student should agree to enter a specific topic, in this way, the learning was consolidated, the process was evaluated, and the answers were compared according to the different cultural models. One of his disciples was Plato, who showed that writing enhances the intellect and knowledge of the human being in the construction of knowledge. Another Greek who contributed to education with more than two hundred educational treatises was Aristotle, who stated that education was infinite and never-ending because it was a process of latent and lasting improvement that continued throughout life, raising problems of various orders on the endless.

It is fascinating to know that since ancient times, there have been people who possessed the gift of teaching, attending to, understanding, and providing solutions to various problems at different times. Moving further in time, we encounter Juan Luis Vives, who, while alive, wrote treatises on teaching in which he described the school as a place to cure ignorance. Between 1492 and 1540, he emphasized the importance of intellectual practice that would serve the student throughout their life.

The evolution of knowledge and mentality, as well as its impact on the development and use of language, was influenced by the new historical and cultural contexts created by the phenomenon of Spanish Renaissance humanism.[2]

Between the years 1870 - 1952 lived Maria Montessori, a medical doctor and dedicated to teaching, an eminent person who contributed with several writings on scientific pedagogy; she proposed to approach each individual by identifying their abilities that would lead them to acquire knowledge; this practice should always be linked to an adult person who guides the student to complete the task entrusted to them, for [3] an eminence who contributed with several writings on pedagogy.

This research presents an opportunity to explore the new approach to pedagogy proposed by John Dewey, a pedagogue, psychologist, and philosopher who challenged traditional and outdated educational methods. This new model, which was used not so long ago, involves creating interest in the child and learning from their experiences prior to introducing new knowledge, evaluating the process, not the result.

Dewey emphasizes the need to combine the active approach focused on children's capacities with the social approach to the educational process.

To refer to Lev Vygotsky is to recall the theory of developmental psychology and to demonstrate the cognitive change that students develop in a study environment as a result of collaborative learning processes (1896-1934). He also argued that students have better development when they interact with their mental and psychological functions, engaging in some activity or learning. His contributions to neuropsychology were considered pioneering, and he was the founder of historical-cultural psychology. He was also a pioneer in the dialogue about the cultural evolution of humans and the cultural development of children.

One of the key figures in the development of the theory of cognitive development was Jean Piaget (1896-1980). This theory is based on the fact that the child, through the years, is developing its capacities each time, increasing its degree of complexity to reach its knowledge; this character works on mental processes and investigates how a child thinks or differentiates from the elders, his constructivist theory confirms that everything is a cognitive process of the human being. Each time improves when the child is linked with its educational environment.

For Piaget, the process of internalization is explained through intellectual development. It has three periods: sensory-motor intelligence, the period of preparation and organization of concrete operations, and the period of formal logical thinking.[4]

It is worth mentioning that each character has their approach according to an era and is highlighted because this was the basis for a new way of teaching children for the French author Celestin Freinet, a pedagogue and researcher. This author lived from 1896 to 1966. This pedagogical current has been linked to current educational models without losing sight of its essence, which has been to strengthen academic processes.

For Agustín Nieto Caballero (1889-1975), knowledge was manifested in modern knowledge and experimental knowledge, always linked to education as saving childhood to have a better country; he also mentioned that the teacher should be enthusiastic, respectful, and motivating towards his students, this character evaluated through playful activities that he presented to his Colombian students.

Also known as the active school, whose foremost advocate in Colombia was Agustín Nieto Caballero, and also the founder in 1914 of the modern Gymnasium. This educational institution was a pioneer in Latin America in implementing this pedagogical model, utilizing modern knowledge..

He is a researcher and holds a graduate degree in philosophy and literature. José Iván Bedoya was born in Medellín in 1949. This intellectual emphasizes that pedagogy must turn inward to demonstrate how it is being taught. He is a firm believer that the teacher is the inescapable support for developing all kinds of knowledge. His method of evaluation was self-evaluation. He also mentioned on many occasions that instructing is not everything; to mold character to educate before instructing will be a key element in the education of his students.

Didactics is a valuable instrument for the construction or instruction of the whole man. That is why didactics is linked to Pansophy. Man is the center of pansophical thought, but it transcends it.[5]

All pedagogical currents have left their mark on humanity; their aim has always been for human beings to develop to their full potential. Since ancient times, they have sought to understand how children think and how they can be helped to excel in the tasks entrusted to them, always with the guidance of a teacher who contributes to their experience. Behaviorism shifted its perspective, emphasizing that the teacher guides and influences their students, inculcating attitudes, and they, in turn, respond to the stimuli as planned by the teacher. However, this approach also lacks a critical spirit and does not allow students to reflect.

Constructivism takes a giant step forward in the construction of knowledge because the actors in education are in total harmony; the teacher accompanies them, and they develop a critical conscience, allowing them to discuss their ideas in class with everyone.

If constructivism is understood as a theory that offers explanations for the formation of knowledge, it is necessary to delve into the ideas that marked the path of its development. As an expression of the human mind, it is deeply rooted in the history of philosophical ideas, which reveal conceptions of man and knowledge.[6]

This stage is closely tied to the use of digital tools in educational environments. In addition to learning from the teacher, digital tools facilitate self-directed training; the student has the facility to self-prepare, create content, and become a co-author of their education, and will never stop learning because it is linked to new environments.

Behaviorism, cognitivism, and constructivism are the three primary learning theories most commonly employed in the design of instructional environments. These theories, however, were developed at a time when technology had not yet significantly impacted learning. Over the last twenty years, technology has revolutionized the way we live, communicate, and learn. Learning needs and the theories that describe the principles and processes of learning must reflect the underlying social environments in which they occur.[7]

Literacy

In today's societies, reading and writing are considered essential skills for acquiring knowledge and participating in various aspects of cultural life. Literacy is the compilation of practices articulated in multiple types of texts, including books, newspapers, magazines, social networks, and advertising.[8]

It is considered one of the most important. In general, both hemispheres of the brain are used, and it is the one that characterizes writers. The extensive use of language has been a crucial component in the development of this type of intelligence[9]

Reading and writing are skills that extend beyond individual capacities, enabling the construction of meaning that is reflected in society through people's ability to develop and negotiate meaning in their daily lives.[10]

Google for Education, interactive applications, and educational videos will attract the attention of students and serve as a channel to achieve the objectives set at the beginning of the school year. This educational model is applied according to the environment and is at the forefront of academic institutions nationwide.

Reflective thinking involves the active, persistent, and careful consideration of any belief or practice, taking into account the reasons that sustain it and the consequences it may have in the future. However, it has been considered that reflection is the cornerstone for modifying educational practice.[11]

Vygotsky emphasizes the significance of language in cognitive development, where the child, possessing prior knowledge, can construct concepts more efficiently. From Ausubel's position, he states that the learner's learning depends on the cognitive structure related to the new information acquired.[12]

As García[1] mentions, it is essential to enhance students' abilities, strengthening both the written and oral

components, to achieve the objectives established by the governing body of education.

Education for all faces a significant challenge, as it is not only about guaranteeing access and permanence in the education system but also about enhancing the quality of education. Hence, it is essential to have a line of research focused on literacy with at-risk populations.

Precursors or predictors of reading are variables related to the child or their environment that are directly linked to the acquisition of reading.[13] The constructivist theory contributes with various models or learning structures which consist of acquiring all kinds of knowledge autonomously; also by the tutor or responsible teacher who will provide guidelines, the student will have to strengthen their self-learning through the practice of reading with texts according to their age and personal tastes, in the same way it should be done with writing to avoid ingrained shortcomings from their early school years and to develop language skills.[14]

The importance of being able to write correctly in academic education

It is natural to learn the mother tongue from the first years of life, and with time, it is expressed through features, strokes, and learning to write. This educational practice has been developed to enrich the intellect and capabilities of students; however, over time, a particular issue has been observed: a significant percentage of students struggle with writing or reading any text.

Empirical experiences in various sub-levels and levels of education in the national public system in which it has been possible to work and evidence multiple failures produced presumably by the high use of mobile devices and little reading practice, incoherence in writing, and numerous spelling errors, among others.

A pandemic that posed two crucial problems for traditional education, as Careaga-Butter, Badilla-Quintana, and Fuentes-Henríquez (2020) expose, since, firstly, neither the education system in general, nor educational institutions, nor teachers and students, were sufficiently prepared to face this abrupt and challenging change. Secondly, the dynamics of the crisis revealed the existence of significant digital gaps in terms of access to equipment, connectivity, and the skills needed to innovate in teaching and learning.[1]

This has a direct impact on the cognitive development of children and young people. Given this problem identified in classrooms, it has been decided to work with the sample of the eighth year of general basic education of the Monseñor Juan Wiesneth Educational Unit. Given the problem identified in the classrooms, it was decided to work with a sample of eighth-grade general basic education students from the Monsignor Juan Wiesneth Educational Unit, seeking a tangible solution through a current pedagogical proposal that applies ubiquitous U-learning. This approach involves evolving and maturing the knowledge developed using ICT as a training strategy.

Because students nowadays spend a lot of time with their mobile devices, we start with something basic, such as installing a spell checker. As they write a text, it should present a well-written option. If this is the case, the new study methodologies applying readings that attract the attention of the young reader should always ask questions about what they have read; in this way, the student analyses what they have read and use it to develop their cognitive abilities further, This exercise will be carried out online and with a group of students who will be given sheets of paper, and the same evaluation method will be applied. The applications, programs, web pages, and virtual environments will also be used to strengthen these processes; the internet is a great tool that provides good results in other countries, where students are more linked to it and have new educational models of learning, linking this proposal in the country to give equality to the children of this academic unit in a rural sector of the province of Guayas, Naranjito canton, El Rosario precinct.

Public education and new educational methodologies EDTEC

It has been a significant step forward for humanity to evolve in all aspects, particularly in education. This research aims to demonstrate how the traditional banking model has evolved into a more collaborative educational approach. There are numerous resources available nowadays to consolidate learning in students, all of which are designed to do so in an entertaining manner.

The human being is always at the forefront and shows how to improve educational processes. Establishing a purpose that fulfills a need and the nature of humanity as a whole, for which culture as a whole, for which each particularity makes sense because of its linkage and interdependence with the others and with the whole.[15]

Educational technology has reached new environments since the beginning of the new millennium, progressively becoming part of our classrooms, but making a difference by being a resource in the planning of teachers; it should be noted that technology in our country is expensive, and therefore many educational institutions do not have resources or allocation to equip their classrooms and provide quality education according to international standards.

The changes in education took a giant step forward at the beginning of the year 2020; the world and national authorities raised the global alarm and sent us to confinement as a result of a pandemic caused by the Sars Cov-2 Coronavirus (COVID-19) after suffering disastrous results, multiple investigations were carried out by laboratories or multinationals with international scientists, Several vaccines were found a year after the pandemic began, the virus is not as lethal for people who have been vaccinated against this malignant

virus, the importance of hygiene has been reinforced in communication channels to avoid further contagion, educational establishments closed their doors because there should not be crowds in closed places such as classrooms where different subjects are taught.

The pandemic allowed the use of digital platforms at a global and national level; this produced a resounding change in education as classrooms moved to computers, homework to educational platforms, the search for information did not stop, tutorials, YouTuber teachers, social networks were used to teach, students generated multimedia content for the benefit of their education, this was a reflection of what was observed on television and internet in the pandemic, education did not remain static, it advanced and reached remote places.

One of the most significant changes was the adaptation of educational levels that had previously not considered online teaching, such as early childhood education, primary education, and compulsory secondary education. Overnight, they were forced to transition to 100 % online teaching, which required them to involve students' families, often causing major conflicts due to a lack of resources or training. Therefore, changing the entire methodology, including the way of teaching content, the ways of relating to other colleagues and teachers, etc., was a significant challenge for all educational agents.[16]

In addition to providing emotional support during the 2020-2021 school year, a variety of pedagogical activities were developed through interdisciplinary projects, utilizing educational platforms, mobile phone applications, and video games, among others. This is the case of students who are not contacted or who do not have access to the internet because they are of low income; it was here where they managed to contact relatives, and they were proposed to deliver printed material and give a guide on how to develop the activities sent by their teachers of different subjects, this resource called interdisciplinary card was delivered to the home or educational institution so that the student continues with their academic process.[17] When the classes were implemented in the national education system, many teachers bought blackboards and set up classrooms in their homes, thinking in the traditional way of teaching a class; they did not innovate their knowledge or educate themselves about the new educational methodologies, which in many cases was conflictive for teachers with many years in the teaching profession.

Innovation in the classroom goes hand in hand with digital platforms or applications for mobile devices and computers that support the educator when it comes to imparting some knowledge; among the most used tools were Microsoft Teams, Google Classroom, e-learning platforms or LMS, Moodle, Chamilo, Claroline, WhatsApp, Zoom, Facebook, Prezi, cambas, educaplay, centimeter, and many more that make knowledge fun and are user-friendly platforms.

The classroom innovation models most consistent with those of curricular innovation are socio-communicative and collaborative, aimed at improving the classroom climate and the teaching-learning process and developing a relevant culture to advance the mastery of training competencies.[18]

Educational technology is understood as a scientific approach based on systems theory that provides educators with planning and development tools through technological resources, aiming to improve teaching and learning processes, maximize the achievement of educational objectives, and promote learning effectiveness.[19]

It is necessary to emphasize that the teacher must know the educational model; the more knowledge they have about it, the more they will be able to create a didactic planning and use of tools and techniques according to meet objectives that will have a favorable impact on the education of students.[20]

The valuable contribution of ICT has been significant throughout the school year as education has migrated, and it has been possible to meet the objectives set at the beginning of the year. In the educational context, the actions taken to ensure that teachers acquired or mastered new ways of teaching and did not harm their students' learning were multiplying. The process of adaptability was easy for many due to their link with technology or new methodologies, but it was also stormy for another group. Implementing a change or educational model has multiple characteristics that differ from traditional education.

It is possible to link basic processes for school performance differently, for example, teaching geography, natural sciences, and anatomy using technologies where maps of cities, types of plants, and human body system, among other subjects, are discovered visually with the help of technologies so that knowledge is more entertaining and enriching for students, the new digital tools are to contribute to the learning of the whole world. They are only a click away between us and the web 5.0.[21]

Educational innovation is closely linked to the motivation, training, and evaluation of teachers, who are the decisive actors in generating changes in educational processes and innovations, both pedagogical and technological.[22]

Part of a good educational model is the teaching staff, who must have a vocation to impart specialized knowledge to students, laying the foundations through expertise and guiding the development of knowledge and techniques.[23]

Blended learning, also known as blended learning, is an adjustable approach that highlights the development of cognitive skills, improved understanding and application of acquired knowledge, decision-making, appropriation of ICT management, time flexibility, accessibility to information, speed of communication, and

the development and updating of content.[24]

The virtual learning model implemented in several educational institutions nationwide is related to EVA. This virtual environment platform transports students from their usual school to a friendly web-based environment.

It is adjustable in both educational environments, highlighting the development of cognitive skills, improving understanding and application of acquired knowledge, facing future problems, decision-making, appropriation of ICT management, time flexibility, accessibility to information, speed of communication, and development and updating of content.[25]

The pandemic and education

Over the last two years, the world has suffered a major health emergency caused by COVID-19 and its variants, which also had repercussions in the field of education. Educational centers of all kinds have migrated towards digital platforms, and teachers have transitioned from face-to-face activities to developing their teaching activities in virtual education classrooms.

This COVID-19 virus surprised the world, but it did not hold education back; it only took it out of the school from its physical spaces and managed to direct it in another direction, the homes of the students, nor did it manage to take away the hope of better days in grey days where confinement stalked the cloister of families. The school at home gave the impression that everything remained the same and the children were not affected; this valuable contribution provided emotional support at times when anguish knocked on the door of a neighborhood, city, or country.[26]

It is essential to share knowledge, anecdotes, and results on how we adapt to the new educational reality, the mechanisms and process, and transformation of the latest educational methodologies that at the beginning were little known to achieve teaching and learning, highlighting those examples that have had a significant impact, with equity in access to education and from a globalized vision promoting inclusive education and global citizenship.[27]

Teachers have reacted to the new emergency posed by COVID-19 by learning about telematic tools and virtual spaces, their teaching effectiveness and usability, as well as the impact on learning, is of great relevance to obtain an overview of best practices, in favor of a correct transformation of universities, institutions, and educational centers to virtual teaching.[28]

All educators at different sub-levels and levels of education must inexcusably incorporate new pedagogical and didactic tools into their planning. This implied going beyond the use of technology or installing a program on their computers. The tone was repeated, and the lack of preparation was evident; the pandemic forced them to leave behind paper, blackboards, evidence, and other formative and summative assessment tools as they transitioned to virtual education platforms.[29] The academy should consider incorporating an adaptation for future teachers into their pedagogical curricula, enabling them to master technological tools and thus incorporate collaborative learning practices, such as project-based learning, which allow flexibility in curricular processes, including transversality in learning objectives.[30]

All educational institutions closed due to the pandemic caused by the coronavirus, which resulted in the cancellation of their creative aspects, thereby closing off their liberating potentialities. The school as a virtual and familiar space is entirely new.[31]

The 'Great Confinement' and the globality of this disease, combined with the conditions of planetary interconnectivity (through social networks and various technological media), have brought to light a series of elements that perhaps had not been reflected upon in depth. Among them, we can point to the glaring evidence of the socio-economic inequalities and uncertainties of the world we live in, as well as the likelihood that the presence of highly contagious diseases (such as COVID-19) will change the way we carry out and understand aspects of everyday life that we thought were established and constant, such as public transport, work, communications, commerce, entertainment, and education.

COVID-19 Education Plan

Once MINEDUC launched a highly successful campaign in the 2020-2021 school year, many changes were made to traditional education due to the pandemic. The authorities planned new strategies to reach students, teachers, and the broader educational community, as well as to provide pedagogical tools.

More than 1,3 billion students worldwide who are part of the educational process have been affected by the COVID-19 pandemic. Global and Ecuadorian education faces several challenges, as the entire academic environment has undergone a complete transformation in a short period.

New study methodologies and practices in psycho-emotional and psychosocial knowledge were well imparted during these challenging times, marked by the numerous human losses of family members, friends, and acquaintances, to promote and strengthen the construction of an adaptable and contextualized educational model.[9]

Education in Ecuador faces multiple technological challenges, and with them, we must acknowledge that changes have arrived, and we must adapt.

In many cases, this model was adapted to meet the study center's needs; however, we cannot compare a school in the historical center of Quito with a rural school, which has more deficiencies in terms of access to communication channels. In this way, the right to education was guaranteed to the children in the crisis.[4]

Emotions are the connection that enables human beings to learn. By using digital tools such as videoconferencing, an approach is achieved in the cold virtual environment, transmitting content with warmth, motivation, and affection to give continuity to the educational process.

Many Ecuadorian teachers and students assumed that they would receive classes differently or traditionally; however, tele-education was a strategy that caused difficulties. Additionally, students were required to develop activities, and space was allocated to promote and empower students and teachers to utilize technological media as a result of the isolation caused by the pandemic.

COVID-19 is seen as an ad hoc scenario for evaluating educational policies implemented at the national and international levels in terms of achievements, limitations, and challenges for educational systems in extraordinary contexts, such as the current one.[10]

The health emergency caused a commotion in the national context, and the authorities on duty implemented new regulations that regulate, empower, and provide for the actions of educational actors at the country's higher, basic, and baccalaureate levels in their various specializations.

Article 2.- The forms of implementation of Open Education: a) Virtual: It is mainly based on the tools of new information technologies, especially the Internet. b) Online: It is carried out synchronously and asynchronously.

Let us learn together from home a MINEDUC program to tackle the pandemic. In the coastal and Galapagos regime, work was carried out in phase one called 'Let us learn together at home,' which served as a pedagogical instrument in all sub-levels and levels of general basic education and baccalaureate. The micro-curricular plans for the two semesters can be downloaded, showing general objectives, the name of the project, essential concepts, skills, indicators, and other relevant details.

Source: Taken from the website Educational Plan "Let's Learn Together at Home" - Ministry of Education (Education.gob.ec).

Figure 1. Let's Learn Together at Home Education Plan

In public educational institutions, some teachers have had to be hastily trained in the use of ICTs, as well as to use their resources. The Ministry of Education has offered a series of emerging training courses for teachers.

In this way, the school year was planned, and many teachers and students collaborated with various digital platforms to deliver a quality class within the parameters established by the national education authorities.

Virtuality is a global educational trend. Therefore, it has been implemented effectively in first-world countries; however, a similar experience has not been observed in Latin American countries, where these educational methodologies have been gradually increasing.[15]

Consequently, numerous resources were implemented from the website provided by the Ministry, which included more than 800 resources to support teachers and students. What caught the attention of this sector of professionals was the development of an educational contingency plan, together in Casa Regimen Costa Galapagos, prioritized curriculum for the emergency, English foreign language, toolbox for diagnostic reinforcement, guidelines for Baccalaureate, pedagogical support guide for the educational community during the period of suspension of school activities due to the Covid-19 health emergency.

During this time, teachers have faced technological challenges and understood that technological platforms or resources are not the change but rather the pedagogical approach and the interaction that must be created between teacher and student.[16]

Based on pedagogical currents, didactics have been responsible for facilitating student learning. That is, it seeks to create a direct connection between educational theory and practice through the application of appropriate strategies to promote an education aligned with the student's social reality.

This section provides guidelines for preparing the institutional plan for educational continuity, the primary objective of which is to gradually utilize educational facilities that were previously abandoned due to the

pandemic. Additionally, guidelines were sent to educational institutions so that they could develop their PICE and subsequently register it. These activities helped the progressive use of the facilities and were developed by the entire educational community. This plan ensures the permanence of students in the educational system; once the PICE has been completed, the corresponding permission is sought from the COE (Special Operations Committee) to guarantee the safe return of students, teachers, and others.[3]

It should be emphasized that not all educational actors were required to return, only the representatives who decided that their representatives should attend the school. All of this was carried out by the guidelines of the Risk Management Committee, the Ministry of Health, the Education District, and the Education Zone, all of which were linked to facilitate a return to the classrooms. All these plans were implemented through ministerial agreements.

Confinement opens the possibility of reuniting children with their parents in the field of values education and the development of socio-emotional skills that are as relevant as academic content.

The education system benefits pupils' development

This educational system is evolving, and proof of this is the link with new study methodologies such as:

Project-based learning, cooperative learning, gamification, problem-based learning, design thinking, and thinking-based learning are all methodologies used in this new era due to the significant contributions evidenced in studies of first-world schools.[8]

These new teaching methodologies are implemented through the combination of educational environments or needs visualized in the classroom, providing an advantage over traditional or banking education that seeks to teach students to memorize information; on the contrary, applying these new techniques enhances the intellect and makes it a co-author of education.

The country has developed changes in private schools, and education in the fiscal area has not had much emphasis on the application of LMS or digital platforms; this is the result of the low purchasing power of the representatives who, in many cases, share a mobile phone to have access to connectivity for several of their children, it is unusual to observe a student on a computer developing their teaching activities.

There is no point of comparison between students in a city with 5G internet quality and the internet provided by companies in the rural sector, as there is always a deficiency and poor signal for many students at the time of connectivity. Therefore, the activities or new methodologies linked to the technological aspect of technological resources are not fully developed.

The research aims to highlight the reality of education in Ecuador following the COVID-19 health emergency and subsequent confinement. This has revealed that 44 % of the student population cannot access virtual education due to a lack of economic resources, a situation that is more prevalent in the rural sector.[22]

To achieve competency-based learning, it is necessary to integrate content into curricular structures. In this way, the learner can internalize that the content to be learned is part of the curriculum.

That the content to be learned is part of their professional actions. The national curriculum in the area of Language and Literature contributes to several specific objectives in the education of students at the upper basic sub-level.

Language and culture. Through the reading and production of texts, students at this sub-level will understand writing as part of culture. They will recognize the written heritage of other cultures, their languages, and the written preservation of the oral tradition. The skills and content of this block provide the opportunity to reflect on the country's native languages and identify their importance in constructing identity and socio-cultural diversity. This curriculum fosters knowledge and appreciation of linguistic diversity to cultivate an intercultural and plurinational society, which will be reflected in the exit profile of the Ecuadorian Baccalaureate.[13]

Oral communication. Students will develop oral communication skills that enable them to function efficiently. They will recognize the central ideas they want to convey and argue them. To produce oral texts (conversation, dialogue, narration, discussion, interview, exposition, presentation), they will apply the appropriate knowledge of lexical order (adequacy of vocabulary) and syntactic order (correct construction of sentences) for the communicative situation in which they find themselves.

They will understand the importance of tolerance when engaging in discussions and will recognize the need to listen to, value, and interpret the arguments of others. In this way, they will contribute to the efficient development of the general objectives of this area.

Reading. Analyzing the explicit relationships between two or more texts, identifying the differences between various types of text, and making basic inferences enables students at this sub-level to acquire the ability to understand the basic structure and aims of the selected texts.[9]

Students need to choose a variety of texts, according to specific criteria, to meet their reading interests and needs. The skills planned for this sub-level will enable students to achieve autonomy in the use of cognitive strategies, develop self-regulation of comprehension, and, in addition, fulfill the reading purpose they have set for themselves. They will acquire the ability to select judgment, platforms, and sources of information.

They will be able to identify valid and reliable information, gradually becoming effective readers. They will know how to manage and organize the institutional library and other libraries.

Writing. The production of different texts on various platforms enables students to demonstrate logically ordered structures, which are essential when producing a text. Likewise, the simulation of communicative situations provides a guideline for recognizing these structures. Students, together with the teacher, will develop the ability to reflect on language and the skills of producing oral and written texts, thus contributing to the general objectives of the area.

At this sub-level, students will understand and construct meaningful textual units, deepening their comprehension of text structure to produce logical and organized writing. In addition, the use of narrative structures in different types of texts will enable them to develop their style when writing their texts.[2]

Literature. Through interaction with oral and written literary texts, students will develop their interpretations, criticisms, and evaluations of the explicit contents. In addition, they will make their first inferences about the implicit intentions of the author and the text based on their understanding and mastery of literary figures, which they will apply in the production of their literary texts as they seek their creative style.

Cognitive awakening and its impact on students' education are fundamental tasks for all teachers. Developing techniques to improve cognitive abilities in students has been a significant effort by many psychologists, pedagogues, and educators committed to the laudable work of teaching. To enhance these capabilities, the student's brain must be exercised.

These capacities are interpenetrated in how the student thinks concerning their chronological age, place of development, or academic training. What they have been able to learn with the skills developed is gradually consolidated in the areas of language or other sciences that present difficulty.

When developing an activity, it is essential to assess whether the group has mastered the subject or whether new strategies should be adopted to strengthen the development in each of the sub-levels or levels of education. Some activities promote knowledge in various subjects to be applied in the final class activities, serving as a formative evaluation. This allows the pupils to consolidate what they have learned.

Developing cognitive skills is not only the responsibility of the school but it is also an obligation of the school representative. Establishing different strategies for resolving tasks or schedules will help in solving problems in more complex subjects. Relating knowledge from different tasks can also aid in self-preparation with digital tools or platforms. Learning is always within reach, just a click away on a computer or other smart device.

The new methodologies and educational models related to challenge-based learning, project-based learning, and virtual learning environments help improve the different sub-levels and levels of education in public schools across the country, developing qualities such as analysis, reflection, collaborative work, planning, communication, and decision-making, among others.[25]

According to a study each individual possesses certain tendencies that act as forces, which can be leveraged to improve their thinking habits. Curiosity, in particular, serves as a force for the development of thought.

Project-based learning

This type of learning emerges so that students can develop the conglomerate of acquired knowledge and improve skills when presented with projects throughout their lives; it is implemented in first-world countries, obtaining excellent results; the PBL is an active methodology that enhances the work of the student is also associated with collaborative work, planning, progress and completion of activity have constructivist principles, developing countries have implemented for several years this new methodology with a steady pace and with the help of different communities of study.

Project-mediated learning is a pedagogical strategy that enables the construction of knowledge through hands-on learning and research. The big difference between a classical methodology and an active one lies in the fact that students will seek answers through the development of activities or projects; in the development of the same, several processes lead to the final work, and the teacher becomes more of a coach because he/she guides in the development of a project and seeks that the objectives set out are achieved in their entirety.[11]

The research developed in PBL is not a scientific process but a didactic one: its function is to give students a sense of authenticity, enabling them to discover the basic principles of a discipline.

Project-based learning (PBL) is an alternative approach that enables students to learn by doing, drawing on the social reality in which they are immersed. One of the public policies in education occurred in October 2012 when the Ministry of Education sought to implement a methodology using open television channels; the purpose was to bring knowledge to the homes of children and adolescents developing soft skills that are only a miscellany of social skills, which provide cultural development and solve strengthens shortcomings or skills not acquired, this methodology is also known as the ABP.[14]

This methodology is also known as Problem-Based Learning (PBL) or Project Based Learning (PBL). Educational innovations facilitate the development of students and teachers when planning and developing their classes; however, it is essential that everyone has access to the necessary information. Otherwise, it would generate a process of exclusion.

To mitigate the distances in terms of access to educational content for students in the Mexican context, class sessions have been implemented through open television channels to minimize lag, dropout, and the risks of exclusion in Basic Education.

Project-based learning is a pedagogical method that falls under active methodologies, and more specifically, within the teaching strategy known as Learning by Discovery and Construction, which contrasts with the expository or magisterial strategy.

Learning through cooperative work is linked to the promotion of socio-emotional skills in students.[6]

In this way, knowledge will be imparted more willingly in all sub-levels and levels of education that emphasize good performance in the areas of language and literature, as well as related fields.

ICTs in the Ecuadorian public education system

This text is part of several research studies conducted in various parts of the world on the impact of ICTs on education, aiming to enhance the joy of learning by developing intellectual, reasoning, cognitive, psychosocial, emotional, and other skills.

Video, computing, and telecommunications are the basis of cutting-edge technologies in our environment. ICT has significantly strengthened this market, facilitating information, communication, education, and business, thereby enhancing the intellect of human beings in all environments.

The rapid advancement of information and communication technologies is transforming the way knowledge is produced, acquired, and transmitted. A new world opens up the possibilities of linking technology with the classroom, providing many more opportunities to reach remote places or places far from the school; digital platforms are spaces for educational development that help to organize better the material or resources to be used in the virtual or face-to-face classroom, we manage to disseminate content synchronously and asynchronously without losing the interest of students at all levels.[7]

In the field of education, technologies augur the progressive disappearance of space and time restrictions in teaching and the adoption of a more student-centered learning model.

At the same time, they favor the commercialization and globalization of higher education, as well as a new model of organizational management Learning environments, in many cases, pose a significant challenge for those who do not master information technologies and aim to impart practical knowledge, similar to the traditional school approach; in many cases, the interest and the effective use of the tool are lost.

On the other hand, it is an advantage for those who master the use of technology and are always in constant self-training or attend academies to continue their studies and improve as teachers of the new millennium.[18]

Linking ICTs to education does not mean removing the teacher from their workplace and programming a computer to serve as a communication channel for a distant period. However, instead, it empowers him or her with greater pedagogical competencies and exalts him or her because he or she is the one who has to take the reins of the planned curriculum, marking a significant gap in the old functions where the student was only a mere spectator; now he or she is a co-author of knowledge and professional development.

One of the benefits offered by ICT within the educational process is that information and knowledge of any kind imaginable can be sent, received, stored, and subsequently retrieved without any geographical limitation.

Multichannel strategies were employed in online classes and contributed to the knowledge of children in every sense. The use of research work and educational experiences by the teacher was also effective. Similarly, WhatsApp groups served as a platform for interaction between teachers and students, aligning with other research findings.[1]

Technological resources facilitate interaction between human beings and their daily lives. However, in small cities, technology is not accessible to everyone. Social networks, such as WhatsApp and Facebook, are used for educational purposes due to their low costs. Many students utilize these platforms on mobile devices, Tablets, and iPads.

The e-learning boom seen in the last decade has companies, organizations, and especially training institutions rethinking their educational strategy; some, generally with traditional educational models, have been isolated from the dynamics that this global trend has awakened and are only now beginning to inform, others are just testing a learning management system or learning management system LMS in which they can organize and distribute course materials, develop discussion forums, tutorials, monitoring and evaluation of students.[4]

In developed cities or cities with a high purchasing power, educational platforms are the best option, as they can be used to develop the contents of the classes, linking them to the delivery of assignments, either by email, online forms, digital books, educational videos, or to the Internet, digital books, educational videos, or applications that can be used for education and training in user-friendly educational environments.

The Ministry of Education of the Republic of Ecuador considered initiating activities virtually. The research was systematized using analytical-synthetic and inductive-deductive methods. The results show that the transition from face-to-face to virtual education revealed shortcomings and differences in the use of technological resources, a change that affects students and legal representatives from rural areas in particular, as well as the poorest class of the country.

The constitution of the Republic of Ecuador, approved in 2008 in articles 26, 27, 28, and 29 of the fifth section related to education, states the following:

Art. 26.- Education is a right of people throughout their lives and an inescapable and inexcusable duty of the State. It is a priority area of public policy and state investment, a guarantee of equality and social inclusion, and an indispensable condition for a good life. Individuals, families, and society have the right and responsibility to participate in the educational process.

Art. 27.- Education shall be centered on human beings and guarantee their holistic development within the framework of respect for human rights, the sustainable environment, and democracy; it shall be participatory, compulsory, intercultural, democratic, inclusive, and diverse, of quality and warmth; it shall promote gender equity, justice, solidarity, and peace; it shall stimulate a critical sense, art and physical culture, individual and community initiative, and the development of competencies and capacities to create and work. Education is indispensable for acquiring knowledge, exercising rights, and building a sovereign nation, and it constitutes a strategic axis for national development.

Art. 28.- Education shall respond to the public interest and shall not be at the service of individual and corporate interests. Universal access, permanence, mobility, and graduation shall be guaranteed without discrimination of any kind, and education shall be compulsory at the initial, basic, and baccalaureate levels or its equivalent.

It is the right of every person and community to interact between cultures and to participate in a learning society. The State shall promote intercultural dialogue in its multiple dimensions. Learning shall take place in both formal and non-formal education. Public education shall be universal and secular at all levels and free up to and including the third level of higher education.[21]

Art. 29.-The State shall guarantee freedom of teaching, academic freedom in higher education, and the right of individuals to learn in their own language and cultural environment. Mothers and fathers, or their representatives, shall have the freedom to choose for their children an education based on their principles, beliefs, and pedagogical options.

In the same way, the Organic Law of Intercultural Education LOEI in its articles 5 and 6, paragraph g, of the obligations of the state concerning the right to education, states the following:

Art. 5.- Education as an obligation of the State. - The State has the unavoidable and inexcusable obligation to guarantee the right to education to the inhabitants of the Ecuadorian territory and its universal access throughout life, for which it will generate the conditions that guarantee equal opportunities to access, remain in, move around, and graduate from educational services. The State exercises its steering role over the Education System through the National Education Authority, as mandated by the Constitution of the Republic and relevant laws. The State shall guarantee quality, free, and secular public education.

Art. 6.- Obligations. - The primary obligation of the State is the complete, permanent, and progressive fulfillment of the constitutional rights and guarantees in the field of education and of the principles and purposes established in this Law. The State has the following additional obligations:

(g) To guarantee the compulsory application of a national curriculum, both in public, municipal, private, and fiscommissioned institutions, at its various levels: initial, basic, and Baccalaureate; and modalities: classroom, blended, and distance. Regarding cultural and linguistic diversity, it will be applied in the official languages of Ecuador's various nationalities. The curriculum design will always consider the vision of a plurinational and intercultural State. The curriculum is complemented according to the cultural specificities and peculiarities of the various institutions.

Education in Finland is an example of innovative learning environments and approaches to learning for its population. Finland is one of the best countries in the world for providing quality education. Since several years is in the highest place worldwide in the PISA tests, the success of their education surprises many developing countries also the great powers due to multiple cultural and academic factors that enhance the intellect of children and young people in this system of public and free education in this country private education does not exist.[29]

Secondary schools typically have one counselor for every 200 students, allowing them to be available to all students who come to them for guidance on their studies. Even if the student does not need to, he/she must visit his/her counselor at least twice a year.

Education in Finland is personalized and, at the same time, collaborative in learning; children associate and promote collaboration in the classroom, which is not the case in other countries, where the trend in the West is to see children competing with each other, and this is very harmful to education, Public school teachers are important and respected in education, many consider them to be the best asset, they are praised because most or all of them are specialists in education with third, fourth level studies, diplomas, doctorates etc.

"In Finland, we consider the quality of education to be essential, one of the most important values of our country. It is important that all pupils, regardless of their social class, can have the possibility to develop their talents."

In this country, the teaching profession is highly valued, and the whole population has much confidence in their teachers. Something remarkable about this education system is that teachers enjoy considerable freedom. There are no barriers to teaching or a specific methodology to be used for all students. Classes are developed as the teacher wishes, and they are not tied to a set form. The common goal is good school management.

According to the Government of Education, the basis of Finland's success in the PISA test can be concentrated on nine points:[24]

1. Equal opportunities: finland's education system provides equal opportunities to all, regardless of residence, gender, economic status, or cultural or linguistic background.
2. Completeness of education: Basic education covers nine years, from age 7 to 16. Schools do not choose their pupils, but all pupils can choose a school in their school district.
3. Competent teachers: all teachers are highly qualified and highly dedicated.
4. School guidance and education of students with special educational support needs: There are many resources available for individual learning and the integration of students.
5. Evaluation: the evaluation of learning achievement in schools and among students is encouraged and supported.
6. The importance of education in society: finnish society highly values education and values education very highly, and the population has a high level of education about international standards.
7. A flexible system based on empowerment: the education system is flexible, and the education administration sets general standards and provides support for its development.
8. Cooperation among all levels: education authorities collaborate with teachers' organizations, professional associations, and school management.
9. An active and student-oriented learning concept: the organization of school work and education is based on a learning concept that is focused on the activities of the students.

Something that is striking in schools and colleges in this country is that the teacher is only called by name; there is no prejudice as to who is more in the classroom, unlike a teacher in Latin America who is called by his or her academic title, there is a different atmosphere where trust prevails between the educational actors and the love of teaching and learning from the best is reflected.

In addition to all the above, the school day begins at 9:00 a.m. I think it is a time when every child has been able to rest and recover enough energy for a new academic day, which is not the case in Ecuador, as children are taken to school at seven in the morning feeling sleepy and sometimes without breakfast, which affects their performance in the classroom, One of the strategies of the European teachers is to dictate their class and make breaks every forty-five minutes to be able to play fifteen and usually continue their day until the break, it is another national reality why it is necessary to have near one hundred and eighty minutes to the student receiving classes without breaks in many of the cases and it is there where the child or young person is fatigued of being seated for a long time.[11]

Education systems continually improve based on successful models, and soon, a new reform will emerge that significantly enhances the education of thousands of children and young people in the national public system, thereby reducing the educational inequality gap.

Neurodidactics, also known as neuroeducation, is a new approach to teaching students

Many authors emphasize the importance of neuroeducation in education, not only for children and young people but also for adults. Neuroeducation integrates various branches, including neurology, education, and educational psychology, which currently play a crucial role in the classroom. To effectively develop the class, we must understand what is happening in the student's brain.[15]

Neuroeducation is a framework that situates knowledge of the brain and its influence on a person's interaction with their environment within the context of specific aspects of teaching and learning.

While it is true that this type of analysis in education is costly because different artifacts must be used to measure the student's behavior during an activity. The educational world has evolved, and now it is easier to detect different types of educational disorders and neurological and psychological problems that may be caused by a deficit of attention when teaching a subject; for each branch, there are specialists, and we can say that the teacher moderator can direct the student to make some assessment and have a clearer picture about the understanding of activity, at the end of a class the teacher should continually assess to know the degree of attention of their students to build knowledge.[15]

All the abilities and capacities that the human being possesses are coordinated and organized by the brain, which is constantly learning and developing. In general, the student develops learning and knowledge through various activities.

As knowledge about the functioning of the human brain becomes more accessible to educators, the learning process will become more effective and meaningful for both educators and learners.

Neuroeducation enables the evaluation and improvement of teacher preparation, as well as collaboration in the learning process, recognizing that genetics is not a determining factor, unlike the environment, which can significantly influence learning.

A study carried out on students at Saint Lawrence University in New York found that there are cognitive found that there are cognitive advantages to studying and chewing gum.

To demonstrate this, they tested 224 students, divided into three groups: the first group took the exam after chewing gum for 5 minutes beforehand, the second group chewed gum during the exam, and the third group took the test without chewing gum. The first group was by far the most efficient, a phenomenon that one of the study's authors, Serge Onyper, justifies by saying that chewing increases blood flow to the brain. This results in an increase in memory capacity for 15-20 minutes.

The neuroeducator is prepared to develop new educational programs tailored to the needs of each educational center. If neuroeducation generates knowledge to design new intervention techniques capable of improving learning and the cognitive and emotional development of students, then it would be of great help in improving the teaching-learning process and human development itself.[26]

Virtual environments or educational platforms are an educational strategy that contributes to virtual education.

More than five years ago, this term began to make inroads in positive aspects of the learning of students worldwide, producing an effect on technology, business, and communities since the internet is the network that manages to connect everyone or people far from traditional educational centers linked in first instances in distance education, universities, public schools were those who invested first in these digital platforms that have improved or repotenciado throughout these years.[28]

The e-learning platforms are virtual environments that help teachers connect with their learning community, interacting synchronously and asynchronously through an interface that guides them in developing planned activities, such as lessons, chats, blogs, and other resources that can be designed to consolidate learning in students.

The LMS or digital platforms facilitate project-based learning by allowing students to interact through collaborative activities. These activities do not necessarily have to be connected at the same time, and that is where the tool works asynchronously. This approach develops students' sense of responsibility through tasks directed via email and discussion forums. On the other hand, synchronous learning attracts students' attention because it is carried out in real-time, and for this, various tools are available, such as expert presentations, videoconferences, participation roulette, electronic blackboards, and chats, among others.[7]

It is essential to consider that the key to eLearning platforms lies not only in the choice of platform but also in how it is utilized to maximize the full potential of all its functionalities for participation.

Among the platforms most chosen by educational entities to better manage their study time or school schedules are free or open-source LMSs: ATutor, Chamilo, Claroline, Dokeos, LRN, Moodle, and Sakai. There are also commercial LMSs or LMSs that you have to pay some money for licensing or use: Almagesto, Blackboard, Edu 2.0, E-ducativa, FirstClass, Nixty, Saba, WizlQ, Ecollege, WebCT, OSMedia, SidWeb.

We conclude with Cloud LMSs, which offer complete flexibility and are typically used online, relying on the internet for their primary support. They can be accessed 24 hours a day without restrictions: Canvas, Edmodo, Schoology, Udemy. Udacity, edX, Coursera.

Mobile devices at an early age

It is common to see an adult entertained with his or her mobile device for a good part of the day, but it is not advisable for a minor to have the same behavior or manipulation of these screens because multiple factors can affect their cognitive development or alter their lives without their parents realizing it until it is too late.

Human beings need to rest between six hours and no more than ten hours to recover from the previous day's work. The same applies to children and young people studying in schools or colleges, who often do not manage to rest adequately.

Lack of sleep due to various causes directly affects the school performance of a developing student. Children and adults are unable to sleep due to the excessive use of technological devices at night. The lack of responsibility and control is causing bad habits that are harmful to the health of students. There is evidence of a decline in the intellectual development of young people who excessively use mobile phones.[19]

All mobile devices, tablets, iPads, and consoles emit blue light, which affects melatonin levels in this segment of the population. This, in turn, impacts the academic performance of children and young people, as they are unable to recover their energy for a new day fully.

Behavior and concentration are not at their best. Additionally, engaging in outdoor activities is associated with a better quality of sleep and a lower likelihood of nighttime awakenings. Therefore, it is recommended that children should not have electronic devices in their bedrooms to avoid overexposure.

In teaching practice, the use of devices is every day, managing to link the new educational trends; it is evident in students when teaching a class, the skills of writing, reading, and attention favor the formation

and development of learning skills, channels that favor cognitive development are used and this is where the importance of ICT in education lies, as technology is related to education.

Motivated students improve their school performance; this important aspect falls on the teacher when teaching their classes. Being more empathetic, friendly, and respectful in this way favors the students in their learning.

This favors students in their daily learning, whether in a classroom in person or virtually through digital platforms.[1]

Mobile devices have a daily and continuous presence in people's lives. They have become the de facto technological complement par excellence, with which an increasing number of tasks are carried out and on which we spend a growing portion of our digital lives.

There must be a positive and not excessive use of mobile devices by ordinary users or students in schools or colleges. Now, it is part of our daily lives and has become a valuable resource in education, an important part of people's lives, which in turn causes saturation in home networks.

It was once thought that the classrooms of the future would be a reality, and now they are. Schools and universities have virtual campuses and access to multimedia platforms, and technology is an integral part of these communities through devices such as electronic tablets and computers. Students are an active part of these communities. Education is not static; it has evolved and will continue to take giant steps. We must keep up with it in order to provide an education with solid foundations and bases for future generations.

Ubiquitous learning in an Ecuadorian reality

When discussing this type of learning, which has already made inroads into the national education system while remaining relatively unknown due to its English terminology, U-learning explains its origins and strengths both inside and outside the classroom.

Ubiquitous education enables learning at any time and in any place, depending on the application environment, and is supported by digital tools that facilitate the inclusion of various actors within the training process.[6]

This type of learning can be linked to different areas of knowledge; there are worldwide researches that corroborate it as feasible in the development of students and as a pedagogical tool in educational processes.

The applications that are on the web for both iOS and Android systems are part of the different tools that can be implemented in the classroom, from basic areas to subjects with a higher degree of complexity, even learning different languages with current methods, listening to music in super light formats and being able to practice it by reading, the purpose of education will always be to empower students with new knowledge and even better is that they learn without realizing it.

ICTs have made learning ubiquitous, as we have already discussed. This learning can occur at school, at work, at home, or through mobility. New learning occurs anywhere, at any time.

For a decade, research and work have been conducted on the implementation of educational strategies, with the collaboration of various universities that aim to serve the common good of the educational community, encompassing both traditional and distance learning students.[14]

Within the characteristics mentioned for the implementation of ubiquitous education to support the learning process, technological aspects must be taken into account: on the one hand, the infrastructure, and on the other hand, the software. All the resources that we wish to implement derived from tics must first be subject to research or self-preparation in order to achieve the expected results, in the same way, whether they are resources or services that we find on web pages, blogs, etc. In this way, we ensure the effective operationalization of the working group; it is very encouraging for students to be connected to a mobile device, especially knowing that this device is an integral part of everyone's daily life. The creators of applications, programs, video games, and consoles, among others, are obligated to continue contributing to the educational field because technology is an integral part of everyday life for children, young people, and adults and can bring about changes that benefit cognitive, integral, social, personal, or human development.[15]

Digital natives are always associated with devices such as television, video games, mobile phones, internet, among others. From this social form in which students of the present time develop, it is necessary to know to what extent their intellectual functions and cognitive capacities favor study or academic activities that differ from the way their parents and grandparents studied. The brain has responded favorably to ubiquitous environments in education; its functionality works in parallel with the decision-making that is often associated with video games.

The studies carried out favor cognitive and reading development in children.

The author in the study carried out on the development of reading and writing: acquisition and linguistic domains states that there must be a conscious level of all the processes mentioned, such as cognitive, metacognitive, conceptual, in order for the student to feel fulfilled when developing an activity guided by their teacher.

For this purpose, a semi-longitudinal study was conducted with 30 first-year children in schools, comprising 17 boys and 13 girls, to promote processes of constructing a written language that favors reading and writing and to become a valuable object in the child's education.

The literary classifies the level of absolute mastery that is developed during the writing process, perfecting the acquisition of language in both reading and writing so that all types of texts can be understood more easily. This mastery enables reading and writing about what has been read with ease.[22]

A study the way of writing symbols and signs was crucial in the cultural development of children. After mastering this way of expressing themselves, they appropriated this system and exchanged knowledge inside and outside the classroom.

In his study on learning to read and write in Spanish in at-risk contexts. Describes, predicts, and explains the transformation and influence of literacy in the development of student's skills, also linked to the training of It describes, predicts, and explains the transformation and influence of literacy on the development of students' literacy skills and teacher training, aiming to make literacy learning a priority.

A study of 120 children in rural La Paz, Bolivia, showed that reading and writing require concentration to achieve satisfactory educational outcomes.

Satisfactorily achieve complex educational knowledge and cognitive awakening in each of the grades or courses where free public education is provided.

Among the basic cognitive skills necessary for acquiring reading and writing, it is essential to work with perception, attention, working memory, and IQ. In conclusion, students should be followed up so that they can master the educational knowledge or literacy skills that are detected as being weaker in their academic training.

CONCLUSIONS

Based on an in-depth analysis of the role that literacy plays in cognitive development, it can be affirmed that these processes are essential for the integral education of students, as they not only provide access to knowledge but also enhance critical, reflective, and communicative skills. The historical evolution of writing systems, from Sumerian pictograms to contemporary alphabets, reveals that the need to express oneself and convey ideas has been a constant across all cultures, underscoring the significance of language as a tool for development.

The influence of great pedagogues such as Socrates, Plato, Vygotsky, Piaget, Montessori, and Freinet has been decisive in transforming educational methods, shifting from traditional models based on memorization to active, collaborative, and student-centered approaches. These theories have allowed the teaching of literacy to be conceived today as a social process, contextualized and oriented towards strengthening higher cognitive functions.

The emergence of Information and Communication Technologies (ICT) in the field of education, particularly during the COVID-19 pandemic, has accelerated an unprecedented pedagogical transformation. The use of digital platforms, mobile applications, and interactive resources demonstrated that it is possible to implement ubiquitous learning that responds to the needs of the current context. However, it also highlighted the deep technological gaps that exist, especially in rural areas such as the educational institution in the Naranjito canton, where this research is contextualized.

Ultimately, it is concluded that the implementation of innovative methodologies, such as project-based learning, the strategic use of ICT, and the enhancement of reading and writing skills, are key tools for improving the academic and cognitive performance of students. The commitment of teachers, institutions, and families to accompany these processes is essential. A commitment to inclusive, critical, and contextualized education is the path toward a more equitable society that is prepared for the challenges of the present and the future.

BIBLIOGRAPHIC REFERENCES

1. García Canclini N. Lectoescritura juvenil en tiempos de narraciones transmedia. Comun Soc. 2015;645238:42.

2. Montealegre R, Forero LA. Desarrollo de la lectoescritura. Univ Nac Colombia. 2006;9(1):25–40.

3. Ramírez-Montoya MS, García-Peñalvo FJ. Presentación. La integración efectiva del dispositivo móvil en la educación y en el aprendizaje. RIED Rev Iberoam Educ Distancia. 2017;20(2):29. https://doi.org/10.5944/ried.20.2.18884

4. Rodríguez CN. Neuroeducación: solo se puede aprender lo que se ama. 2020;38:263–268.

5. Bernal R. La curiosidad en el desarrollo cognitivo: análisis teórico. 2013;116–128.

6. Restrepo Gómez B. Plan Educativo COVID-19 – Ministerio de Educación. Ministerio de Educación. 2020;7.
7. Pérez Gómez ÁI. Sinéctica. 1986;34(40).

8. Restrepo B. Plan Educativo COVID-19 – Ministerio de Educación. Ministerio de Educación; 2020. p. 7.

9. Trujillo M. Study of reading comprehension in Latin America: the need for a comprehension-oriented perspective. Innov Educ. 2014;14(64):47–56.

10. Giraldo C. La escritura en el aula como instrumento de aprendizaje. Estudio en universidades. Ánfora. 2015;22(38):39–59.

11. Cornejo E. Recursos didácticos virtuales en proyectos de ciencias naturales en período de confinamiento por COVID-19. Rev Electr Cienc Educ Humanid Art Bellas Art. 2019;3:188.

12. Robert J. La educación en Finlandia. 2006.

13. Bocchio M. Enseñanza remota de emergencia ante la pandemia Covid-19 en Educación Media Superior y Educación Superior. Propósitos Represent. 2020;8(SEP3).

14. Montoya M, Sánchez L. Pedagogía de lectoescritura en el aprendizaje constructivista: talleres interactivos. 2018;1–163.

15. Nicolás AMB, Ramos PR. Investigación-acción y aprendizaje basado en proyectos: una revisión bibliográfica. Perfiles Educativos. 2019;40(163):109–122.

16. Mora F. Neuroeducación. Madrid: Alianza Editorial; 2014. p. 148–162.

17. Romero L. 'Apps' educativas para rediseñar la educación del futuro. El País. 2020. Disponible en: https://elpais.com/economia/2020/09/23/actualidad/1600864548_666566.html

18. Dorio I, Sabariego M, Massot I. Características generales de la metodología cualitativa. En: Metodología de la investigación educativa. 2004.

19. Gervilla E. Buscando valores. El análisis de contenido axiológico. Perfiles Educativos. 2001;23(93):95–110.

20. Poza JJ, Pujol M, Ortega-Albás JJ, Romero O. Melatonin in sleep disorders. Neurología. 2018. Disponible en: https://doi.org/10.1016/j.nrl.2018.08.002

21. Ortiz J. Virtual campus: education beyond LMS. RUSC Univ Knowl Soc J. 2007;4(1). https://doi.org/10.7238/rusc.v4i1.291

22. Ministerio de Educación del Ecuador. Currículo de los Niveles de Educación Obligatoria Subnivel Superior. 2019;2:527.

23. Ramos R, Rhea P, A. Recursos didácticos virtuales en proyectos de ciencias naturales en período de confinamiento por COVID-19. Rev Electr Cienc Educ Humanid Art Bellas Art. 2017;3:1–19.

24. Gripenberg M, Lizarte R. El sistema educativo de Finlandia y su éxito en la prueba PISA. Jett. 2012;3(1):14–24.

25. Pérez B, Inés C, Beaufond C, Eduardo C. Una mirada a la educación ubicua. 2019.

26. Bricall J. Las TICs en los procesos de enseñanza y aprendizaje. Cienc Digit. 2020;3(2.6):422–439.

27. Gavilanes Sagñay MA, Yanza Chavez WG, Inca Falconi AF, Torres Guananga GP, Sánchez Chávez RF. Las TICs en los procesos de enseñanza y aprendizaje. Cienc Digit. 2019;3(2.6):422–439.

28. Ministerio de Educación del Ecuador. ACUERDO Nro. MINEDUC-MINEDUC-2020-00038-A. 2020. p. 1–15.

29. Rojas NDP. Lectoescritura juvenil en tiempos de narraciones transmedia. Comun Soc. 2018;645238:41–64.

30. UNESCO. Las TICs en los procesos de enseñanza y aprendizaje. Cienc Digit. 1998;3(2.6):422–439.

31. Estrada M, Estrada M. Recursos didácticos virtuales en proyectos de ciencias naturales en período de confinamiento por COVID-19. Rev Electr Cienc Educ Humanid Art Bellas Art. 2016;3:188.

FINANCING

None.

CONFLICT OF INTEREST

Authors declare that there is no conflict of interest.

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