Virtualidad: utilización de los recursos tecno pedagógicos en el fortalecimiento de la comprensión, la memoria funcional, la imaginación y el razonamiento con perspectiva en el aprendizaje significativo

Virtuality: use of technological pedagogical resources to strengthen understanding, working memory, imagination and reasoning with perspective in meaningful learning

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Resumen

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Introducción. La educación virtual contribuye al desarrollo del proceso de aprendizaje mediante la introducción de las tecnologías de la información y la comunicación (TIC) promueve en los estudiantes las habilidades y conocimientos a su propio ritmo, durante un período de tiempo predeterminado; al ser un sistema abierto controlado por el usuario facilita el intercambio de ideas y saberes a través de diversos espacios bajo la guía y el apoyo de los educadores (es decir, profesores que dirigen las actividades educativas). **Objetivo.** El propósito de este estudio fue fundamentar teóricamente las variables de estudio; diagnosticar el nivel de desarrollo de las habilidades lectoras; e identificar que recursos aplicados en la comprensión lectora. **Metodología.** Se adopta el enfoque cualitativo, y cuantitativo, el diseño fue no experimental, el nivel exploratorio y descriptivo, la muestra quedó conformada por 38 estudiantes, se empleó el diagnóstico de las dificultades en la comprensión lectora para identificar los recursos tecno pedagógicos que utilizan los maestros. **Resultados.** se obtuvo que el rendimiento es insuficiente (07,9), no fomenta la comunicación exteriorizando dificultades en el entendimiento del texto escrito (06,3), no efectúa inferencias (06,8). Mediante la revisión de literatura había una correlación entre los problemas en el uso de recursos didácticos tecnológicos y las habilidades lectoras habilidades lectoras. **Conclusión.** que el nivel de las habilidades lectoras plantea la necesidad de utilizar la tecnología sobre todo en estudiantes tienen dificultad para leer y comprender textos, de esta forma se aporta en el rendimiento académico, la expresividad, la interactividad, autonomía y creatividad. **Área de estudio general:** Pedagogía. **Área de estudio específica:** aprendizaje significativo, comprensión, recursos tecno pedagógicos, virtualidad. **Tipo de estudio:** Artículos originales.

Keywords:
meaningful learning, understanding, technological pedagogical resources, virtuality

Abstract

Introduction. Virtual education contributes to the development of the learning process through the introduction of information and communication technologies (ICT). It promotes students' skills and knowledge at their own pace, during a predetermined period; Being an open system controlled by the user, it facilitates the exchange of ideas and knowledge through various spaces under the guidance and support of educators (that is, teachers who direct educational activities). objective.The purpose of this study was to theoretically

substantiate the study variables; diagnose the level of development of reading skills; and identify what resources applied in reading comprehension. Methodology. The qualitative and quantitative approach is adopted, the design was non-experimental, the exploratory and descriptive level, the sample was made up of 38 students, the diagnosis of difficulties in reading comprehension was used to identify the technological resources used by teachers. Results. It was found that performance is insufficient (07.9), it does not encourage communication by externalizing difficulties in understanding the written text (06.3), and it does not make inferences (06.8). Through the literature review, there was a correlation between problems in the use of technological teaching resources and reading skills. Conclusion. That the level of reading skills raises the need to use technology, especially in students who have difficulty reading and understanding texts, in this way it contributes to academic performance, expressiveness, interactivity, autonomy and creativity. General study area: Pedagogy. Specific area of study: meaningful learning, understanding, technological pedagogical resources, virtuality. **Study type:**Original articles

Introduction

The investigative work using techno-pedagogical resources to improve reading skills in General Basic Education students of the Intercultural Bilingual Educational Unit "Huayna Cápac", takes on its relevance when considering that Information and Communication Technologies (ICT) have caused constant changes within the educational field, being necessary its incorporation for the development of students within the reading skills, a line of research of innovation and a sub line of learning focused on the first years of life of children who can capture, more easily than an adult; In addition, the Ministry of Education of Ecuador (MINEDUC, 2018), through the use of digital advances, seeks new reading strategies that motivate the student in the progress of their basic skills (attention, comprehension, language and thinking).

Currently, educational units must incorporate technological advances and their updates; the Huayna Capac Intercultural Bilingual Educational Unit is no exception, being an innovative subject the use of techno pedagogical resources that can be applied in all areas of study, although it is true that today's society is based on scientific and technological knowledge that produce large-scale changes. With this, it seeks to develop in students the

physical, intellectual and moral capacities to enable the acquisition of knowledge, in this way contributing to the integral development of students.

Techno-pedagogical resources are tools that allow the development of the reading process. These are called to carry out innovation within education, which allows interactive didactic activities that awaken the interest and attention of the student during the teaching and learning process, in this way contributing to the achievement of the curricular objectives related to reading and writing.

Years ago, these reading skills were considered as a decoding and memorization of texts, however, thanks to the use of resources, tools and interactive strategies, the capacities and skills that make up reading competence have been strengthened, an aspect that benefits the construction of meanings, language, the ability to communicate, process and interpret, possibly in the future new technological levels will be observed based on digital reading, being necessary to take advantage of the present and use digital tools to motivate the student to improve their reading fluency.

According to Romo(2019), reading competence includes the knowledge, skills and strategies that human beings develop during their life, being able to apply in different contexts; while reading comprehension is the capacity that human beings have for the application of cognitive and metacognitive thinking strategies, in this way, they constitute elements that favor the integral construction of a reader; in this regard, the school must strengthen the indicated components during classroom processes, in this way the awareness of the importance of reading in their training and its interaction with the context is developed in the students. From a dialectical perspective, theUnited Nations Educational, Scientific and Cultural Organization(UNESCO, 2020), states that it is important to take advantage of advances in information technologies in strengthening educational systems, the dissemination of knowledge, and access to information, to achieve effective learning; in reference to the use of technologies in education, it mentions that it contributes to the achievement of educational objectives for equity, with inclusive and equitable quality education (p. 4).

Within the framework of teacher competencies in ICT, UNESCO(2019)expresses that:

> In order to integrate technologies into teaching and learning, it is necessary to redefine the role of educators in the planning and application of virtual resources. The aim is to innovate and improve learning. For this reason, the educational system, through comprehensive national regulations, must incorporate the use of ICT in education into training plans as a priority element of pedagogical work.

Furthermore, the Code of Children and Adolescents, Title III, Rights, Guarantees and Duties, Chapter III, Rights related to development, in art. 37. Right to Education, Literal 4 mentions that:

"Ensure that children and adolescents have adequate teachers, teaching materials, laboratories, premises, facilities and resources and enjoy a favorable environment for learning" (National Congress of Ecuador, 2003,p. 7), finally, the Ecuador Digital Strategy 2.0 in coordination with the Ministry of Telecommunications (MINTEL), in policy 1, proposes: "to promote social, solidarity and inclusive development in rural, marginal urban sectors, communities and priority attention groups, through the intensive use of ICT" (National Congress of Ecuador, 2003,p. 15).

TheOrganic Law Reforming the Organic Law of Education, held in Quito and approved on April 19, 2021, in Art. 2.3. Principles of the National Education System, literal f:

Flexibility: Education will have a flexibility that allows it to adapt to local and global diversities and realities, preserving national identity and cultural diversity, to assume them and integrate them into the national educational concert, both in its concepts and in its content, scientific-technological basis and management models (p. 10). Likewise, Art. 6 Obligations, below, details the obligations of the state, literal m which mentions that: "Promote scientific and technological research and innovation......." (National Assembly of Ecuador, 2021,p. 17)

AdditionallyOrganic Law Reforming the Organic Law of Education, in literal kk and ll it is established:

Ensure the accessibility, availability, affordability and relevance of connectivity in all public education establishments in the country, through adequate coordination between the Ministry of Education and the Ministry of Telecommunications and the Information Society (National Assembly of Ecuador, 2021,p. 18).

Promote and encourage reading and research through the provision of free internet service in school libraries in public and private educational institutions (National Assembly of Ecuador, 2021,p. 19).

For Martínez et al. (2021), one of the main educational challenges faced by educational institutions worldwide is the use of technological resources, virtual tools and interactive strategies; unfortunately, the insufficient knowledge of educators has negatively influenced pedagogical practice, the teaching of content, and the process of understanding, thinking, production, reflection, research and interpretation.

In Latin America, confinement or quarantine measures were taken immediately and, in some cases, with an indeterminate perspective; for Anaya & Rojano (2020), in Argentina, face-to-face classes were suspended on March 14; in Chile, the quarantine forced a massive closure from March 16; in Colombia, continuing with the health emergency decree on March 12; in Cuba, access to educational institutions was indefinitely closed from March 25; in Peru, El Salvador, Uruguay and Venezuela approximately from March 12 onwards (p. 32).

However, students, teachers, and administrators adopted the use of technology and digital communication in different areas. Faced with this situation, Flores (2021) states that in Latin America, internet connectivity reaches 45%, which leaves many students in vulnerable conditions; in addition, as stated by Gómez et al.(2019)The lack of virtual assessment mechanisms, the lack of availability of information and communication technologies in homes, the lack of planning and training in the use of educational platforms, the scarce and insufficient design of interactive strategies are increasing; factors that have increased isolation, the decline in the level of research and the reduction of the budget have generated economic crises in training institutions, leading to the reduction of teachers (Economic Commission for Latin America and the Caribbean [ECLAC], 2020).

In Ecuador, educators express limitations in teaching through the use of technological digital resources, a factor that has harmed reading comprehension according to Anay (2021). Teachers' lack of knowledge in the use of technological teaching methods, combined with insufficient use of interactive tools, has led to memorization and repetition of content; therefore, the use of innovative means to promote virtual learning is essential to reduce difficulties in understanding, analysis, and reflection.

Finally, the lack of training in the use and application of digital tools has influenced the teacher's lack of knowledge in the design of virtual classrooms that benefit the development of text comprehension according to Velásquez.(2023), which makes it difficult to access information and complete tasks, resulting in poor academic performance, evidenced by low grades.

The research is carried out in the area of education in the subject of Language and Literature, which according to the function of the educational level is located in the line of innovation, includes the teaching process, learning and reading skills in the fifth year of General Basic Education of the Intercultural Bilingual Educational Unit "Huayna Cápac", integrates students from 9 to 11 years of age, immersed in the virtual environment, the use of interactive strategies, reading practices and textual content oriented to academic development.

The institution is located in the province of Tungurahua, in the canton of Ambato, in the parish of Santa Rosa. It has 600 students, 40% of whom are bilingual and 60% Spanish speakers. Its main function is to provide quality and equal education for all students. Unfortunately, the insufficient technological and pedagogical resources, the lack of space and the scarce training for educators are difficulties that have led to low academic performance.

Given the above, the main problem is the scarce application of technological pedagogical resources that affects reading skills in students of Basic General Education. The problem detected is compounded by the fact that the insufficient technological resources in the institution have limited access to connectivity, the use of online platforms, and digital resources.

Furthermore, the methodology focused on the repetition and memorization of curricular content has increased the difficulties in developing decoding skills and a lack of vocabulary, which prevents understanding the meaning of words when interpreting the text.

Finally, the lack of training in the use and application of digital tools has influenced the lack of knowledge of teachers in the design of virtual classrooms that benefit the development of text comprehension, harming academic performance and achievement.

Focusing on constructivism, literature review: information and communication technologies in comprehension, reading skills and meaningful learning

The research carried out in Cuba, at the "Marta Abreu" Central University of Las Villas, Carrillo et al.(2022)They carry out the study with the theme: Comprehension and construction of written texts through the use of technology; they propose a system of activities for the development of reading skills in the children's area. In the methodology they use the materialist-dialectical method, the level was theoretical, historical-logical, inductive-deductive, analytical-synthetic, systemic-structural; thus, it strengthened the reflection in reference to the main problems that primary education students face; in terms of the construction of texts, the mathematical and statistical mode was used to analyze the results obtained. In an active, reflective and regulated way, it is obtained that the students, in their majority, present difficulties in reading procedures. Among the contributions, it is necessary to use technological strategies based on the use of virtual resources that awaken creativity and imagination.

The research carried out byTejeraet al. (2021), at the University of Cartagena, with the topic: Use of the Educaplay digital tool as a pedagogical strategy in the development of reading processes, the purpose was to design a pedagogical strategy through the didactic sequence supported by virtual resources to improve reading and writing skills; In the

methodology, mixed research was applied, and Pedagogical Action (IAP), the quantitative and qualitative approaches, the data were collected based on theoretical and conceptual bases in a normative, theoretical field, with emphasis on didactic activities, reading skills and formal thinking; In the results it is obtained that it is essential to use technologies for knowledge, motivation, self-concept, and self-efficacy. It concludes that technology benefits in comprehension, fluency, speed, text decoding, dialogue, expression, understanding and decision making; its contribution stands out in the opportunities to reinforce mental concentration, the ability to interpret speaking and pronouncing skills.

The studies mentioned contribute to the present research by being related to the use of educational technologies, techno-pedagogical resources, interactive tools, reading comprehension and skills, an aspect that contributes to good practices by innovating the way of teaching through the use of virtual environments; its contribution stands out in the exploration of literary genres, the comparison and contrast of information; from this perspective, it increases vocabulary, analyzes the text and identifies images, elements that contribute to coexistence, prior knowledge and the invocation of knowledge.

The information society promotes global connectivity through the web; as a training component, it is included in the curricula of educational institutions at all levels, considering that through resources, tools and strategies it motivates students in the teaching and learning process.

For the above reasons, Information and Communication Technologies through virtual strategies improve reading skills; as stated by De la Cruz & Lara(2019), the use of games contributes to effective teaching, awakens interest and motivation in students, especially at the elementary level, by facilitating interaction, collaboration, peer learning and active learning. For Ortega & Zaravia (2018), it leads to positive results in the assimilation and application of acquired knowledge, and reinforces the ability to solve problems, while in pedagogical work it provides teachers with better tools to teach, direct and motivate students by creating a positive environment that improves their performance.

In accordance with the above, lInformation and Communication Technologies are sets of services, networks, software and devices that aim to improve the quality of life of people within an environment integrated into an interconnected and complementary system, which reorients the teaching - learning and evaluation process of the individual who learns through the use of services, networks, applications and devices offered by the digital age focused on improving the quality of training processes (Carvajal, 2020).

Technological educational resources

ForBuendia & Hogaldo (2022)In the school community, technological teaching resources improve pedagogical practices by reducing lectures based on theory, conceptual aspects and memorization, thus promoting critical thinking, argumentative capacity and comprehensive skills.

The use of technological pedagogical resources in the educational system includes roles that teachers must fulfill with an integrative approach that strengthens the structuring of the learning environment; thusTapia-Repettoet al. (2019) states that the combination of virtual tools with new pedagogy encourages interaction, cooperation, and collaborative work; the reinforcement of teaching skills that include the management and use of virtual tools is essential, an aspect that has impacted the teaching and learning process, the quality of life, and the development of the human being.

According to Ortega &Oyanedel (2022),Information and communication technologies (ICT) facilitate the use of technological and pedagogical resources; currently, it includes didactic processes that guide towards the improvement of learning, the development of capacities (intellectual, procedural and attitudinal), therefore, the role of the teacher is to train to contribute to comprehensive development.

Among word processors, the most widely used is Word, which allows for writing assignments, reviews, narratives, certifications, letters, among others. It includes a spell checker and also allows you to insert images, iconography, portraits, graphics, and sounds. On the other hand, it is a word processor that strengthens comprehension and writing skills (Verdezoto & Chávez, 2018).

Ramirez &Álvarez (2021), technological advancement has allowed evolution in all professional areas, education is no exception, since teachers have integrated technological teaching tools in their classes as new sources of contributions that benefit collaborative learning that integrates students and teachers. In a collaborative context, it contributes to the development of students' skills by promoting sociability, motivation, critical thinking, and self-esteem, factors that lead to self-confidence and self-regulation.

In agreement with what Jiménez et al. stated.(2020)mentions, the incorporation of technological teaching tools into teaching practices represents a pedagogical innovation that guides the fulfillment of teaching goals, by contributing to student learning activities, and forms of evaluation.

The progress of technologies has impacted the progress of society and education in particular, by guiding towards training processes that encompass teacher training, availability of technological teaching tools, the digital skills of students, and the skills of

teachers in adapting materials, resources and activities to meet learning objectives with pedagogical and methodological intentionality (González & Gértrudix, 2021).

It is worth mentioning that sometimes students handle applications better than a teacher, especially if the teacher has not innovated his or her knowledge in the use of technological devices. For the reasons stated by Chango(2023), deduces that through technological teaching tools, educators must strengthen their knowledge through continuous training to guide their students in interaction, participation, critical reading, communication; in addition, they reinforce the search and selection of information, developing skills and abilities for problem solving.

According to Pinto (2020), when talking about reading skills in basic education, reference is made to three aspects: comprehension, fluency and speed. Thus, reading comprehension is the ability to understand written language, from decoding the text to the dialogue between the writer's presentation and the reader's prior knowledge, creating knowledge through this exchange and inference and other reading strategies.

Reading skills contribute to the understanding of reading texts, which includes the reader of the text (person who acquires knowledge in a broad concept through their interaction with the reading, narration or story); while the text refers to the author's intention, the theoretical area, the content, the conceptualization or the written text; in addition, it includes the organization of the message; the context encompasses the conditions in which the reading is carried out, therefore, it observes the reader in their intentions, the interests in the text, the structure and the analysis.

Regarding the development of reading skills, Cano et al. (2022) mention that it is necessary to use methodological guidelines that benefit attention to diversity, through methods that encompass the rhythms and learning styles of students, with a holistic vision that promotes autonomous learning, teamwork, active participation, rational and critical thinking, individual and cooperative work, aspects that lead to the strengthening of reading and research.

According to the above, the educational system is geared towards the training of human beings to contribute to the development of reading skills, the understanding of the needs and potential of people in a democratic, equitable and inclusive environment; cultivating ethical values (generosity, integrity, coherence and integrity), with respect and responsibility towards the context and nature.

Methodology applied in the study of technological teaching resources

In research work with the topic: Use of resourcestechno pedagogicalto improve reading skills in students of General Basic Education of the Bilingual Intercultural Educational Unit "Huayna Cápac", due to the nature of the data and information concerns the mixed

approach because the researcher does not control, manipulate or alter the variables, it is based on interpretations to determine the conclusions, corresponds to the non-experimental design, with a transversal scope because the collection was carried out at a single timeMonkey(2023).

In the mixed-approach study, qualitative research delves into conceptualization, including theory, argumentation, and interpretation; while quantitative research from a systematic perspective using measurement tools, guides toward the evaluation and comparison of statistical and mathematical calculations (Gavilanes, 2023).

Qualitative approachIt was used because the use of technological pedagogical resources and reading skills integrates a reference framework that encompasses the theories and dimensions that are the object of analysis, from this context, it is oriented towards deepening the study in a flexible and reflective way to strengthen the experiences in a natural context.

Quantitative approach.It was applied in the research because from the empirical deductive logic it allowed the application of procedures, resources, methods and the use of data collection techniques such as the survey that through structured questionnaires

Bibliographic research.*It is used as the main source of information texts or other printed or recorded intellectual material; that is, through bibliographic research in books, scientific articles, the research work is based on the principles and theories of deepening knowledge regarding the independent variable techno-pedagogical resources and the dependent variable reading skills that support the research work, including specific opinions of the subject to bibliographic research promoted the selection of documents and written works published in search engines such as Google Scholar, Physics Online E-Books, to reduce the level of similarity, APA Standards were applied. 7th edition.*

Field research.The field study facilitated the collection of information from the real context.The research was carried out with a population consisting of 38 Upper Basic students (Sub-level 3).

Table 1 is presented below regarding the operationalization of the independent variable: virtuality, techno-pedagogical resources, which integrates in its dimensions virtual environments, technological tools, and interactivity; elements that foster creativity, promote collaboration in virtual work, and help students develop teamwork and communication skills.

Table 1

Operationalization of the independent variable: virtuality, techno-pedagogical resources

Conceptualization	Dimensions	Indicators	Basic items	Techniques and instruments
Techno-Pedagogical Resources They are materials prepared to facilitate the pedagogical and didactic work of teachers, through virtual environments and the use of technological tools that promote interactivity between the educator and the student with a focus	Environments virtual	Asynchronous communication	Through the videos used by the teacher, do you understand the language and communication content?	Technique: Survey InstrumentStructured questionnaire
		Synchronous communication	Do you think that the teacher, with real-time classes (via the Internet), reinforces your knowledge, reads fluently and understands the meaning of a text?	
	Technological tools	Virtual platforms	Through the interactive activities that the teacher carries out, through virtual platforms, do you improve reading comprehension, fluency and speed?	

Table 1

Operationalization of the independent variable: virtuality, techno-pedagogical resources (continued)

Conceptualization	Dimensions	Indicators	Basic items	Techniques and instruments
in the acquisition of skills, competencies, the formation of attitudes and the construction of new learning in a flexible and dynamic scenario (Fajardo et al., 2024; González & Gértrudix, 2021; León, 2021)		Virtual presentations	Do you think that, through virtual presentations, the language and literature teacher manages to capture the setting, the characters, the primary and secondary ideas of the text?	
	Interactivity	Diagrams or conceptual maps	Does the use of diagrams or concept maps improve decoding, vocabulary, participation and interaction with peers?	

Table 2 presents the operationalization of the dependent variable: reading comprehension and skills with a perspective on meaningful and collaborative learning, integrating the dimensions, the regulated process, analytical capacity and communication skills.

Table 2

Operationalization of the dependent variable: reading comprehension and skills with a perspective on meaningful and collaborative learning

Conceptualization	Dimensions	Indicators	Basic items	Techniques and instruments
Reader-regulated process to improve analytical skills, communication skills, and learning about relevant ideas in the text	Regulated process	Construction Interaction	In your language classes in the classroom, do you construct meanings that arise from the interaction between the text, the plot, and the reader?	Technique: Survey InstrumentStructured questionnaire
		Interpretation	Do you think that when you finish reading you gain personal experiences, draw conclusions and make meaningful statements?	

Table 2

Operationalization of the dependent variable: reading comprehension and skills with a perspective on meaningful and collaborative learning (continued)

Conceptualization	Dimensions	Indicators	Basic items	Techniques and instruments
	Analytical capacity	Virtual readings	Do the virtual readings used by the teacher facilitate active and collaborative learning?	
	Communication skills	Synthesis	Do the resources used by the teacher promote responsibility, communication and participation in the literature learning process?	
		Understand and summarize the text read	Through the technology used by the educator, have you improved your ability to understand, comprehend and dialogue?	

The following process was used to collect information on the use of technological pedagogical resources to improve reading skills in basic general education students at the "Huayna Cápac" Bilingual Intercultural Educational Unit.

- Research design
- Repair of instruments in case of failure
- Complete field work with data collection instruments.
- View and select instrument data
- Markers for each problem and question.
- Determine the frequency and percentages of information received.
- Create frequency and percentage tables to present information.
- Graph of received data.
- Analyze and interpret the results based on each individual question and point
- Draw conclusions and recommendations based on the objectives.

Validity and reliability of the instruments

Instrument focused on fifth grade students.

The questionnaire was applied to 38 students, it includes a total of 10 questions, concerning the independent and dependent variables; it includes the response options, their abbreviations and their values on a Likert scale, as shown in Table 3.

Table 3

Likert scale of the questionnaire applied to students

Alternative	Abbreviation	Frequency
Always	S	5
Almost always	CS	4
Sometimes	av	3
Seldom	RV	2
Never	N	1

In this section, the criterion set forth by researcher Garrido (2021) is adopted; Cronbach's Alpha values greater than 0.6 indicate that the instrument is reliable. The research worked with 38 cases (students) and 10 elements (questions), a Cronbach's Alpha of 0.903 was obtained through the application of the Microsoft Excel program and the SPSS Statistical Software, the results show a higher level of reliability with an acceptable value in the dimensions: writing, coherence, organization and understanding in its content, as shown in Table 4.

Table 4

Reliability statistics. Questionnaire applied to students

Cronbach's alpha	Cronbach's alpha based on standardized items	No. of items
,903	,901	10

Instrument applied to teachers in the area of language and literature

As Gonzalez mentions& Pazmiño (2015),Cronbach's alpha values greater than 0.6 indicate that the instrument is reliable; consequently, values less than 0.6 indicate that the material may contribute to inappropriate decisions and wrong conclusions.

Table 5

Reliability statistics.Instrument applied to teachers

Cronbach's alpha	Cronbach's alpha based on standardized items	No. of items
,924	,933	10

In the reliability index of the items applied to educators (Table 5), the reliability coefficient obtained is 0.924, a value close to unity, with a very satisfactory level of internal consistency. For this reason, the instrument is written with coherence, clarity and comprehension in its content.

In conclusion, it can be deduced that the two questionnaires achieved a Cronbach's Alpha based on standardized elements greater than 0.9 with excellent reliability.

Results

The results are obtained after applying a questionnaire that includes ten questions, five referring to the independent variable and five to the dependent variable, the purpose is to strengthen the use of technological teaching resources as a strategy to improve reading skills.

Interpretation of diagnostic tests applied to students

The research with a focus on virtuality, includes the variables of technological teaching resources and reading skills, and was carried out with a population consisting of 38 students of Upper Basic Education (Sub-level 3). To obtain information, the following variables are used:Questions related to the use ofresources (videos, real-time classes (via the Internet), virtual presentations, use of diagrams or conceptual maps, virtual readings), components that when used by the teacher influence the understanding of language and communication content, reinforce knowledge, reading fluency and speed, participation and interaction, guiding towards active and collaborative learning (Table 6).

Table 6

Interpretation of diagnostic tests applied to students

No.	Indicators	Analysis and conclusions of the interview
1	Understanding the content	The results of this test indicate an insufficient performance (07.9). In this regard, it was found that students have difficulties in understanding different ways of thinking, which affects the development of language skills and the interpretation of oral and written statements. Therefore, it is necessary to reinforce the reading process with activities that include their attitudes, experiences and prior knowledge.
2	Consolidation of knowledge	It shows that the result is insufficient (06.3), that is, it does not promote communication, causing difficulties in understanding the written text. Therefore, there is a need to improve the way we communicate with others using technological resources that promote dialogue, the exchange of thoughts, feelings and emotions, language, creativity, attitude, empathy, verbal perception and non-verbal signals.
3	Read fluently	The results indicate poor performance (06.8); it shows a lack of reasoning, which makes it difficult to acquire new knowledge and mental images, the externalization of thoughts, the coherence of sentences and the interaction with peers. relationship. Therefore, it is necessary to integrate strategies that benefit reading and cognitive skills from a specific vision in a sociocultural context to achieve the goals and objectives of readers, activate the use of reasoning processes.
4	Reading speed	The results obtained in the last test (shown in Appendix 3), which contain the average points, show that the performance was normal (11.6). Therefore, it is necessary to strengthen children's prior knowledge based on constructivist pedagogy, and therefore technological learning strategies, virtual resources and platforms facilitate the interpretation and understanding of the meaning.
5	Differences in grades on reading materials.	This section, linked to the analysis and conclusions of the interview with reference to the most relevant aspects, emphasizes its social and formative function, having the commitment to promote good behavior before society, having to educate its members under essential moral principles for socialization and consolidation of learning during the didactic process; elements that stimulate the capacity for expression, decision-making, reflection, exchange of points of view and confidence in their demand; components that favor learning opportunities.
6	Distinguish primary and secondary ideas	The performance was average (11.6). Therefore, the introduction of technological resources can stimulate the development of students' reading skills, and they will also participate in the training by actively engaging in the learning process, using and applying tools to achieve maximum professional performance and at the same time increase their skills.

Table 6

Interpretation of diagnostic tests applied to students (continued)

No.	Indicators	Analysis and conclusions of the interview
7	Separate primary ideas from secondary ideas.	It is believed that students have difficulty concentrating when reading, so activities that stimulate learning behavior, building relationships between facts and ideas, comprehension, language, and critical thinking should be used.
8	Order and pronounce the words.	The performance was weak (07.9). Therefore, it can be established that students have difficulties in oral communication, expression of thought, linguistic skills and text comprehension, aspects that hinder the interaction between the text and its readers, learning, assimilation and personalization of personal experience.
9	Active participation in reading.	Insufficient performance (07.4). In this sense, students' language skills are not strengthened, which negatively affects reading ability and motivation, requiring the use of learning strategies or technical materials that influence the selection of texts and create interest in learning.
10	Interaction between text, plot and readers.	Poor performance (08.4) means that students have difficulties in communication skills, comprehension and pronunciation; in this case, technical learning resources will be designed to facilitate narration, dialogue, description and reasoning.
11	Personal experience gained through reading.	This indicator concludes that most students have difficulties with communication, reading comprehension, understanding, conceptual relationships, the reading process, identifying the meaning of words, etc.

Note: *Diagnostic test applied to students*

The results obtained show that it is very important to promote the interpretation of texts, the pronunciation of a single word and the practice of reading through strategies that include the implementation of technological resources that improve the teaching and learning process.

In this context, it is necessary to use technology as a teaching strategy to improve the development of reading skills in primary school students, in order to prevent difficulties in understanding complex texts from a critical and argumentative position.

Continuing with the diagnosis, when talking about reading comprehension, it is highlighted that the linguistic skills of some children have not developed and educators do not use various techniques to improve comprehension, generating deficits in the reading process that can affect language, pronunciation, decoding, vocabulary, formation and reconstruction of knowledge.

Discussion

Based on the diagnosis carried out, the results show that it is important to promote the interpretation of texts, the pronunciation of words and the practice of reading through strategies, including the introduction of technological resources that improve the teaching and learning process.

In this context, it is necessary to use technology as a teaching strategy to improve the development of reading skills in primary school students, in order to prevent difficulties in understanding complex texts from a critical and argumentative position.

Continuing with the diagnosis, when speaking about reading comprehension, it is highlighted that the linguistic skills of some children have not been developed, as well as educators do not use various techniques to improve comprehension, so there is a deficit in reading comprehension. reading process, which can affect language, pronunciation, decoding, formation and reconstruction of vocabulary and knowledge.

Pedagogical and educational uses of technology include virtual materials and strategies that allow students to identify, interact with, and reconstruct information. Unfortunately, students' basic skills and abilities to engage with and properly use digital resources are not yet promoted, creating difficulties in the teaching and learning process in language and literature subjects.

The shortcomings of most fifth graders are: they are not tech-savvy and do not tend to use their devices for reading (they need to learn their specific access and controls to read apps or web pages). The above aspects lead to the following difficulties:

It does not facilitate communication, highlighting difficulties in understanding written words. It does not create new knowledge that corrupts mental representations. It shows limitations in emotional expression and learning new information. It is unable to describe, analyze, understand and connect words in texts and becomes a barrier to reasoning, meaning construction, vocabulary, memory, intonation, rhythm and reading. In the same context, students have not yet developed reading skills, word recognition skills and difficulties in following the rules that determine the reading tone.

Furthermore, they do not share information for specific purposes. Without strengthening the basic communication skills necessary for social life (speaking, listening, reading, writing), the aspects mentioned have a significant impact on productive and creative criticism, reducing the possibility of safe learning and following correct procedures.

Based on the above, it is proposed to test the hypotheses by presenting:

Null hypothesis:

H0:Virtuality: the use of technological pedagogical resources does not influence the strengthening of understanding, functional memory, imagination and reasoning with perspective in meaningful learning in Higher Basic Education students of the "Huayna Cápac" Bilingual Intercultural Educational Unit.

Alternative hypothesis:

H1: Virtuality: the use of technological pedagogical resources does influence the strengthening of understanding, functional memory, imagination and reasoning with perspective in meaningful learning.in the Higher Basic Education students of the "Huayna Cápac" Bilingual Intercultural Educational Unit.

Descriptive data

In this section focused on the statistical area, a pre-test and a post-test were used (Table 7).

Table 7

Descriptive (Explore) Pre test and Post test

Shapiro-Wilk W			Pretest	Posttest
PRETEST	Average		3,0500	4,9737
	Median		3.07	9.55
	95% confidence interval for	Lower limit	2.67	4,9204
	the mean	Upper limit	3.32	5,0270
	Average trimmed to 5%		3,0556	5,0000
	Median		3,1000	5,0000
	Variance		1,066	0.016
	Std. Deviation		1.03238	0.16222
	Minimum		1.00	4.00
	Maximum		5.00	5.00
	Range		4.00	1.00
	Interquartile range		1.32	0.00
	Statistical significance		0.00	0.00
	Shapiro-Wilk W		0.971	0.152

In this sense,Since the same population was used and measurements were taken at two different times, the Student T parametric test was applied for paired samples, having a confidence level of 99%, together with a margin of error of 5% (0.05). The results were as follows:

Being the selection of the t test for related samples, a comparison is established (pre test, post test) of two related measurements (level of reading skills before and after applying the strategy)

The hypothesisnull H0: mentions, there are no differences in the use of technological pedagogical resources and the strengthening of understanding, functional memory, imagination and reasoning with perspective in meaningful learning in Higher Basic Education students of the Intercultural Bilingual Educational Unit "Huayna Cápac" (X1 = X2).

T-test for means of two paired samples

In the statistical test t for related samples, the decision rule establishes: if $p \leq 0.05$ (less than or equal to) H0 is rejected; from the result obtained in the Student t test, with a p-value less than 0.05 (significance 0.000) (Table 8).

Table 8

Paired sample test

					95% confidence interval of the difference		t	gl	Next (bilateral)
		Paired differences							
		Average	Std. Deviation	Std. Average Error	Lower	Superior			
Pair 1	PRETEST - POSTEST	-1,924	1,094	,178	-2,283	-1,564	-10,836	37	,000

It is defined that there is a statistical difference between the pre-test and post-test; therefore, with the results obtained, the null hypothesis that indicates that there are no differences between the means of the tests is rejected.

In reference to the hypothesis raised in the study, hypothesis H1 Virtuality is accepted: The use of techno-pedagogical resources does influence the strengthening of understanding, functional memory, imagination and reasoning with perspective in meaningful learning in Higher Basic Education students of the Intercultural Bilingual Educational Unit "Huayna Cápac", finally, when calculating the Wilcoxon signed rank statistic for related samples, the result is the rejection of the null hypothesis, as shown in

Table 9.

Table 9

Hypothesis Testing Summary

	Null Hypothesis	Proof	Next.	Decision
1	The median of the differences the pre test and the post test is equal to 0	Testing ranges with Wilcoxon sign for samples related	.000between	Reject the null hypothesis

Note: Asymptotic significances are shown. The significance level is .05.

This section details:

Students have not yet developed literacy skills and global word recognition. In this sense, from the school's perspective, they have not acquired the reading and writing skills for learning, which creates barriers to literacy, thus creating the need to develop technological pedagogical resources that facilitate problem solving, explanation and discovery.

It is determined that students did not use their own language, organization, continuity and coherence to express the content of the text; it is necessary to strengthen paraphrasing to improve writing standards, strengthen reading skills, generate new knowledge and learning; therefore, applications are needed to help read the virtual resources of the process. Indicator 17. Participation in the learning process

Students have not yet developed the language skills to communicate effectively in different situations; it is necessary to strengthen the communication skills necessary for social coexistence; therefore, the use of technological pedagogical resources will facilitate the acquisition of prior knowledge, predictions, analysis and forms of expression.

Considering the main function of language as communication as a reference, this question determines the need to carry out an in-depth study of the grammatical components, observe the rules of expression of the language and generate argumentative essays from the axis of language, linguistic elements, pronouns, verbs and syntactic functions.

Therefore, there is a need to identify and infer facts or events to create an order that promotes understanding that will help students develop reasoning skills, listening skills, content analysis, and presentation skills.

Conclusions

- In reference to the theoretical foundation related to the importance of recreational activities with recyclable materials, a literature review was carried out in different repositories that integrate research papers, publications in indexed journals and other documents disseminated in digital repositories.

- It follows that students performed poorly, that is, they did not understand the information when reading, which is a factor that affects communication, reading comprehension and language. In turn, the use of technological pedagogical resources will benefit linguistic skills, reading experience, learning ideas and the practice of values.

- The use of reading materials that benefit communication practice, coexistence, intellectual development and the consolidation of knowledge is insufficient; for this reason, the use of technology that leads to conceptual construction is essential. In this regard, it can be concluded that it is not enough to use reading materials that promote communication practice, coexistence, intellectual development and the strengthening of knowledge; therefore, using technology to create concepts is essential.

Conflict of interest

The authors declare that there is no conflict of interest in relation to the article presented, especially in the conduct of research. Their participation is voluntary, maintains an academic order, with progression in their professional career.

Bibliographic References

Anay Ortega, MV (2021). Development and implementation of a manual of reading comprehension techniques and strategies for use by the teaching staff of the San Gaspar Mixed School in the municipality of Chajul, department of Quiché [Undergraduate thesis, Universidad Panamericana, Guatemala]. https://glifos.upana.edu.gt/library/images/2/29/TESIS_DE_MARIA_VIDALIA_ ANAY_ORTEGA.pdf

Anaya Herrera, N., & Rojano Tovar, C. (2020). Tensions and emotions of teaching practice in times of COVID 19 [Master's thesis, Universidad de la Costa CUC, Barranquilla, Colombia]. https://repositorio.cuc.edu.co/bitstream/handle/11323/7679/TENSIONES%20Y %20EMOCIONES%20DE%20LA%20PR%c3%81CTICA%20DOCENTE%20 EN%20TIEMPOS%20DEL%20COVID%2019.pdf?sequence=1&isAllowed=y

National Assembly of Ecuador. (2021, April 19). Organic Law Reforming the Organic Law of Education. Supplement No. 434. Official Registry.

https://educacion.gob.ec/wp-content/uploads/downloads/2021/05/Ley-Organica-Reformatoria-a-la-Ley-Organica-de-Educacion-Intercultural-Registro-Oficial.pdf

Buendia Barberà, M., & Holgado García, J. (2022). Application of digital technological resources to improve the level of reading comprehension in Catalan. A case study. Edutec, Electronic Journal of Educational Technology, (79), 253–271. https://doi.org/10.21556/edutec.2022.79.2065

Cano Delgado, M., Peña Peña, L., & Rondón, J. (2022). Design of a personal learning environment to enhance the development of reading skills in first grade primary school students at the José María Vélaz Educational Institution [Master's thesis, Minuto de Dios University Corporation]. https://repository.uniminuto.edu/bitstream/10656/14180/2/TM.ED_CanoMaria-Pe%c3%b1aLorena-RondonJania_2021

Carrillo Pérez, L., Veitia Arrieta, I., & Arena Degrasse, Y. (2022). Understanding and construction of written texts through the use of technology. Scientific Pedagogical Journal "Horizonte Pedagógico", 11(2), 42-51. http://www.horizontepedagogico.rimed.cu/index.php/hop/article/view/243/416

Carvajal López, J. (2020). Technological resources as a tool to improve the reading of fourth grade students at the José Celestino Mutis educational institution [Master's thesis, National University of Colombia,San José del Guaviare, Colombia]. https://repositorio.unal.edu.co/bitstream/handle/unal/78062/60262260_2020.pdf?sequence=1&isAllowed=y

Chango Masaquiza, WV (2023). Use of technological teaching resources to improve reading skills in fifth-year students of Basic General Education at the Huayna Cápac Bilingual Intercultural Educational Unit [Master's thesis, Indoamerica Technological University, Ambato, Ecuador]. https://repositorio.uti.edu.ec/bitstream/123456789/5857/1/CHANGO%20MASAQUIZA%20WILLIAM%20VINICIO.pdf

Economic Commission for Latin America and the Caribbean [ECLAC]. (2020, August). Education in times of the COVID-19 pandemic. https://www.cepal.org/en/publications/45904-education-in-times-of-the-covid-19-pandemic

De la Cruz Martínez, G., & Lara Chere, M. (2019). The playful method in meaningful learning in elementary school students [Undergraduate thesis, University of

Guayaquil, Guayaquil, Ecuador].
https://rraae.cedia.edu.ec/Record/UG_80f9b81be2067d2136f8a9e0d35806c1

Fajardo Sánchez, M.P., Cardona Giraldo, L.C., Parra Farfán, L.D., & Caballero
Espinosa, M. (2024). Development of technological skills for the production of
audiovisual material at the SENA Financial Services Center. Scientific Journal.
Engineering: Science, Technology and Innovation, 11(1), 193-207.
https://revistas.uss.edu.pe/index.php/ING/article/view/2802

Flores Huilcatoma, N. (2021). Use of new technologies in times of pandemic in the
training of nursing students at the Technical University of Ambato
[Undergraduate thesis, Technical University of Ambato, Ambato, Ecuador].
https://repositorio.uta.edu.ec/bitstream/123456789/32605/1/FLORES%20HUIL
CATOMA%20NATALY%20SILVANA.pdf

Garrido Castro, A. (2021). Reading strategies and reading comprehension in fifth cycle
students in a public educational institution-San Jerónimo Apurímac [Master's
thesis, César Vallejo University, Lima, Peru].
https://repositorio.ucv.edu.pe/bitstream/handle/20.500.12692/67779/Garrido_C
AL-SD.pdf?sequence=8&isAllowed=y

Gavilanes Cordones, V.F. (2023). Virtual classroom using technological tools for
learning mathematics in sixth-year students of Basic Education [Master's thesis,
Universidad Tecnològica Indoamèrica, Ambato, Ecuador]
https://repositorio.uti.edu.ec/bitstream/123456789/6676/1/GAVILANES%20CO
RDONES%20VERONICA%20FERNANDA.pdf

Gómez Vahos, LE, Muriel Muñoz, LE, Londoño-Vásquez, DA (2019). The role of the
teacher in achieving meaningful learning supported by ICT. Encuentros, 17(02),
118-131.
https://www.redalyc.org/journal/4766/476661510011/476661510011.pdf

González Alonso, J., & Pazmiño Santacruz, M. (2015). Calculation and interpretation of
Cronbach's Alpha for the case of validation of the internal consistency of a
questionnaire, with two possible Likert-type scales. Publicando Magazine, 2(2),
62 - 67. https://revistapublicando.org/revista/index.php/crv/article/view/22

Gonzalez Valencia, H., &GertrudixBarrio, F. (2021). Virtual environments in the school
environment for the development of scientific competence. Editorial
DYKINSON, SL
https://www.researchgate.net/publication/348735355_Entornos_virtuales_en_el
_ambiente_escolar_para_el_desarrollo_de_la_competencia_cientifica

Jiménez Alarcón, LO, López Pazmiño, MN, Freire Pazmiño, JC, & Cabrera López, JR (2020). Importance of teaching and methodological strategies in reading comprehension, language and communication difficulties. Digital Explorer, 4(3), 184-200. https://doi.org/10.33262/exploradordigital.v4i3.1322

León Chocho, S. (2021). Technological tools and reading comprehension of fifth grade students at the UE San Francisco de Quito [Master's thesis, César Vallejo University, Piura, Peru]. https://repositorio.ucv.edu.pe/handle/20.500.12692/76807

Martínez Rodríguez, D., Neiva Cuesta, A., & Sora Olaya, E. (2021). One click away: narratives of teachers and students about the curriculum and assessment in times of pandemic [Undergraduate thesis, National Pedagogical University, Bogota, Colombia]. http://repository.pedagogica.edu.co/bitstream/handle/20.500.12209/16718/A%20un%20golpe%20de%20clic%20narrativas%20de%20profesores%20y%20estudiantes.pdf?sequence=4&isAllowed=y

Ministry of Education of Ecuador [MINEDUC]. (2018). Regulatory Agenda for an Inclusive and Quality Education – MINEDUC 2018. https://educacion.gob.ec/wp-content/uploads/downloads/2018/06/Agenda-Regulatoria-Mineduc-2018.pdf

United Nations Educational, Scientific and Cultural Organization [UNESCO]. (2020). The Agenda for Sustainable Development. https://www.un.org/sustainabledevelopment/en/development-agenda/

United Nations Educational, Scientific and Cultural Organization [UNESCO]. (2019). Framework of ICT competencies for teachers. https://unesdoc.unesco.org/ark:/48223/pf0000371024.locale=en

Ortega Porras, JD, & Oyanedel Bernal, CC (2022). Teachers and information and communication technologies: the new role in times of the COVID-19 pandemic. Revista Educación, 46(1), 1-14.https://doi.org/10.15517/revedu.v46i1.47614

Ortega, J., & Zaravia, C. (2018). Digital educational resources in the teaching-learning process of the area of Science, Technology and Environment [Postgraduate thesis, National University of Huancavelica, Peru] https://apirepositorio.unh.edu.pe/server/api/core/bitstreams/d9ffdb4c-d9b1-429d-8baf-c724a24cd5c9/content

Pinto Díaz, C. (2020). Reading strategies for teaching reading skills to people with high-functioning ASD. MLS Educational Research (MLSER), 4(1), 57-72. https://doi.org/https://doi.org/10.29314/mlser.v4i1.299

Ramirez Vargas, A., & Álvarez Martínez, V. (2021). The impact of virtual meetings on learning in Chilean early childhood education children in a pandemic situation: a case study [Undergraduate thesis, Viña del Mar University, Chile]. https://repositorio.uvm.cl/server/api/core/bitstreams/b4d1634e-390e-4cc3-a18a-cea02e99a124/content

Romo, P. (2019). Reading comprehension and reading competence. Anales Magazine, 1(377), 163-179. https://revistadigital.uce.edu.ec/index.php/anales/article/view/2552

Tapia-Repetto, Gabriel, Gutiérrez, Carla, & Tremillo-Maldonado, Omar. (2019). New technologies in higher education. Study of students' perception about the use of WhatsApp and virtual learning environments (Moodle Platform). Odontoestomatology, 21(33), 37-43. https://doi.org/10.22592/ode2019n33a5

Tejera Acosta, K., Monsalve Menco, N., & García Monje, Y. (2021). Use of the digital tool Educaplay as a pedagogical strategy to develop the reading processes of 5th grade students at the Technical Agricultural Educational Institution of Guataca, rural area of Mompós [Master's thesis, University of Cartagena, Guataca, Mompós, Colombia]. https://repositorio.unicartagena.edu.co/bitstream/handle/11227/14584/TGF_Katherine%20Tejera_Nicolas%20Monsalve_Yolima%20Garcia.pdf?sequence=1&isAllowed=y

Velásquez Ixcotoyac, J. (2023). Relationship between disruptive behavior and academic performance in fourth grade students at the Official Urban School for Boys No. 28, Republic of El Salvador [Undergraduate thesis, University of San Carlos de Guatemala, Guatemala]. http://www.repositorio.usac.edu.gt/19372/1/13%20T%283532%29.pdf

Verdezoto Rodríguez, RH, & Chávez Vaca, VA (2018). Importance of learning tools and environments within the e-learning platform in Ecuadorian universities. Edutec, Electronic Journal of Educational Technology, (65), 68–92. https://doi.org/10.21556/edutec.2018.65.1067

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