



Use of ICT and its relationship to reading comprehension in the English language Uso de las TIC y su relación en la comprensión lectora del idioma inglés

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ABSTRACT

Information and Communication Technologies (ICT) have significantly transformed educational processes. The objective was to analyse the use of ICT and its relationship to reading comprehension in primary school students in Quito, Ecuador. Descriptive with correlational statistical support. The population consisted of 320 students. The results obtained in this study show a very high positive correlation (Spearman's $Rho = 0.944$) and statistically significant ($p = 0.000$) between the use of Information and Communication Technologies (ICT) and reading comprehension in English in basic education students in Quito, Ecuador, which confirms that the use of ICT has a direct and favourable impact on the development of reading skills in English.

Descriptors: competency based teaching; teacher effectiveness; academic achievement. (Source: UNESCO Thesaurus).

RESUMEN

Las Tecnologías de la Información y la Comunicación (TIC) han transformado significativamente los procesos educativos. Se tuvo por objetivo analizar el uso de las TIC y su relación en la comprensión lectora en estudiantes de EGB en Quito, Ecuador. De tipo descriptivo con apoyo estadístico correlacional. La población estuvo conformada por 320 estudiantes. Los resultados obtenidos en este estudio evidencian una correlación positiva muy alta (Rho de Spearman = 0,944) y estadísticamente significativa ($p = 0,000$) entre el uso de las Tecnologías de la Información y la Comunicación (TIC) y la comprensión lectora en inglés en estudiantes de educación básica de Quito, Ecuador, lo cual confirma que el uso de las TIC tiene un impacto directo y favorable en el desarrollo de habilidades lectoras en inglés.

Descriptorios: enseñanza centrada en el rendimiento; eficacia del docente; rendimiento escolar. (Fuente: Tesoro UNESCO).

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Research articles



INTRODUCTION

Information and Communication Technologies (ICT) have significantly transformed educational processes, offering innovative tools that enhance learning in various contexts. In particular, their application in the development of reading comprehension has aroused growing interest in the academic community, given that this skill is fundamental for academic and professional success. Reading comprehension does not only involve decoding words, but also the ability to interpret, analyse and reflect on texts, skills that can be strengthened through the appropriate use of ICT (Sánchez-Domínguez, Pérez-Hernández & Pérez-Padrón, 2020).

On the other hand, Mariaca-Garron et al. (2022) comment that ICT facilitates access to interactive and personalised resources, while Formichella & Alderete (2020) point out that these technologies can improve academic performance, especially in areas such as reading. However, challenges related to their implementation have also been identified, such as the need for teacher training and the digital divide (Gómez-Vahos, Muriel-Muñoz & Londoño-Vásquez, 2019).

In the context of the city of Quito, Ecuador, the use of ICT by students of Basic General Education (EGB) represents an opportunity to strengthen reading comprehension, especially in an environment where technological and educational inequalities still persist. According to Villagómez-Ruiz, Yugcha-Véliz & Zuñiga-Delgado (2023), ICT can play a fundamental role in the teaching-learning process, provided that appropriate pedagogical strategies are implemented.

Therefore, the objective of this research was to analyse the use of ICT and its relationship to reading comprehension in EGB students in Quito, Ecuador.



Theoretical framework

In the pedagogical sphere, the use of Information and Communication Technologies (ICT) has been strengthened as a tool for transforming teaching-learning processes, especially in the development of reading skills. Therefore, the following is presented:

Use of ICT as a pedagogical tool

From a pedagogical perspective, ICT not only represents a set of technological tools, but also a means of dynamising teaching and learning processes. In this sense, Mariaca-Garron et al. (2022), indicate that ICTs allow for the implementation of innovative teaching strategies that favour meaningful learning, by integrating interactive, multimedia and adaptive resources that respond to the individual needs of students, therefore, ICTs become mediators of learning, facilitating the active construction of knowledge.

The pedagogical approach to the use of ICT requires intentional planning that takes into account the principles of instructional design. Therefore, Gómez-Vahos et al. (2019) emphasise that the teacher must assume the role of facilitator, guiding students in the critical and reflective use of technological tools, which is in line with constructivist theories, which consider the importance of the interaction between the student, the content and the technological context to promote meaningful learning.

Likewise, the use of ICT in education must be inclusive and equitable, bearing in mind that Formichella & Alderete (2018) warn that digital divides can limit access to these tools, especially affecting students from vulnerable backgrounds. Therefore, it is essential that educational policies promote the democratisation of access to ICT, ensuring that all students can benefit from its pedagogical potential.



Reading comprehension as an educational skill

Reading comprehension is a cross-curricular skill that forms the basis for learning in all areas of knowledge. From a pedagogical perspective, this skill involves not only the decoding of texts, but also the ability to interpret, analyse, evaluate and reflect on the information they contain (Arteaga-Rolando & Carrión-Barco, 2022). In this sense, reading comprehension is a complex cognitive process that requires the activation linguistic, metacognitive and critical skills.

The development of reading comprehension in the educational context is enriched by the use of ICT, which offers interactive and adaptive resources that facilitate the personalisation of learning. According to Berral-Ortiz et al. (2024), digital platforms and educational applications allow students to interact with texts in a dynamic way, promoting the active construction of meaning, taking into account that digital reading tools can include functions such as integrated dictionaries, automatic summaries and comprehension activities, which support the development of specific reading skills.

METHOD

The research was generated from a quantitative approach, with a non-experimental, descriptive design with correlational statistical support. The population consisted of 320 students, selected through intentional non-probabilistic sampling, considering their access to and frequent use of technological tools in the educational environment.

Two instruments were used for data collection: a structured questionnaire to measure the level of ICT use and a standardised reading comprehension test in English. Both instruments were previously validated by 5 experts in the field of education and subjected to a pilot test to ensure their reliability and validity. The reliability of the questionnaire was evaluated using Cronbach's alpha coefficient, obtaining a value of 0.89, which indicates high internal consistency. The reading comprehension test, on the other hand, achieved a coefficient of 0.91, which also reflects high reliability.



The data obtained was analysed using Spearman's correlation coefficient, given that the variables did not present a normal distribution, which allowed us to determine the strength and direction of the relationship between the variables studied.

The statistical analysis was carried out using SPSS software, version 25, with a significance level of 1% ($p < 0.01$).

RESULTS

The results of the research are presented below, based on the data collected:

Table 1. Correlation of ICT use and its relationship to reading comprehension in English.

Use of ICT and reading comprehension		
Spearman's Rho	Correlation Coefficient	,944**
	Sig. (two-tailed)	,000
	N	320

Source: Prepared by the author.

The results of Spearman's correlation analysis presented in Table 1 show a very strong and significant relationship between the use of Information and Communication Technologies (ICT) and reading comprehension in English among general basic education students in the city of Quito, Ecuador. The correlation coefficient obtained is 0.944, which indicates a very high positive relationship between the two variables. This means that, as the use of ICT increases, students' reading comprehension in English also tends to improve.

The statistical significance value is 0.000, which confirms that this relationship is statistically significant at the 99% confidence level ($p < 0.01$).

Based on the above, the affirmative hypothesis H1 is accepted and the null hypothesis H0 is rejected.



Hypothesis test

H1: The use of ICT has a positive relationship with reading comprehension in English.

H0: The use of ICT does not have a positive relationship with reading comprehension in English.

DISCUSSION

In accordance with the results presented, Aguirre-Idrogo et al. (2021) state that ICT facilitates the comprehension of texts in English by offering interactive and dynamic resources that motivate students. Similarly, Formichella & Alderete (2020) argue that ICT not only improves academic performance, but also fosters autonomous learning, a key aspect in the acquisition of reading skills.

On the other hand, Ballestas-Camacho (2015) points out that ICT is especially useful in the early years of schooling, as it allows students to develop literacy skills more effectively, which is complemented by Arteaga-Cruz et al. (2023), who emphasise that, in times of virtuality, ICT has been fundamental for maintaining and improving reading comprehension, even in basic education contexts.

Consequently, Ulco-Simbaña & Baldeón-Egas (2020) emphasise that ICTs have a direct influence on the development of literacy skills, in that they allow students to interact with texts in a more dynamic and personalised way. This position reinforces the idea that ICTs are not only support tools, but also transform traditional pedagogical practices.

The impact of ICT on reading comprehension has also been compared with traditional pedagogical methods. In this sense, Pérez-Ruiz & La-Cruz-Zambrano (2014) emphasise that traditional reading and writing teaching strategies, although effective, can be enhanced through the use of technological tools. In this sense, Trimiño-Quiala & Zayas-Quesada (2016) propose teaching strategies that integrate ICT to encourage interest in reading, which coincides with the results of this study.

On the other hand, Arteaga-Rolando & Carrión-Barco (2022) present a literacy model based on conceptual pedagogy, which can be complemented with the use of ICT to address current challenges in the teaching of reading and writing. This



perspective allows teachers to combine traditional strategies with technological tools, thus maximising results in reading comprehension.

Likewise, Cárate-Ronquillo et al. (2024) qualify that the methodology of learning literacy must be adapted to current technological demands, insofar as these tools allow the teaching process to be personalised and the individual needs of students to be addressed. This view is supported by Villagómez-Ruiz et al. (2023), who conclude that ICT is essential for transforming the teaching-learning process in basic education.

The design of pedagogical strategies that integrate ICT is fundamental for improving reading comprehension. Therefore, Armijos-Uzho et al. (2023), in their review of studies in Latin America, highlight that ICT-based strategies not only improve reading skills, but also foster motivation and interest in students. This position coincides with the results of this study, which show a positive relationship between the use of ICT and reading comprehension in English.

Likewise, Parra-Bernal & Rengifo-Rodríguez (2021) emphasise that innovative pedagogical practices mediated by ICT are key to addressing difficulties in reading comprehension, especially in contexts where access to traditional resources is limited, in addition to Berral-Ortiz et al. (2024), who highlight that training programmes based on technological resources are effective in improving reading comprehension in primary education.

The use of ICT has not only proven effective in basic education, but also at higher levels, in response to which, Robles-Francia et al. (2020) analyse its impact on public higher education in Mexico, concluding that ICT significantly improves reading comprehension and fosters meaningful learning. Similarly, Núñez-Flores & Ramírez-Mercado (2022) emphasise that ICT is a key tool for developing reading skills in university students, especially in a globalised context that demands advanced foreign language skills.

On the other hand, Salmerón & Villafuerte (2019) point out that reading practices invigorated by ICT generate significant learning achievements, as they allow students to interact with texts in a more active and reflective way, highlighting the importance of integrating ICT at all educational levels. However, despite the



obvious benefits, the use of ICT in education faces certain challenges. Calvo (2013) points out that teacher training is a crucial factor in guaranteeing the success of ICT-based strategies. Teachers must be trained not only in the use of technological tools, but also in their pedagogical integration, a point reinforced by Gómez-Vahos et al. (2019), who highlight the role of the teacher in the creation of meaningful ICT-supported learning experiences.

On the other hand, Mariaca-Garron et al. (2022) identify that, although ICT offers multiple benefits, its effective implementation requires an adequate infrastructure and equitable access to technology. This proposal is particularly relevant in contexts of inequality, as pointed out by Caballeros-Ruiz et al. (2014) in their analysis of successful experiences in Guatemala. Likewise, Formichella & Alderete (2018) emphasise that the use of ICT in the home can complement its implementation in the classroom, especially in contexts where technological resources are limited, which allows students to develop reading skills both inside and outside the school environment.

On the other hand, regarding the analysis of trends in the use of ICT in education, such as that carried out by Sánchez-Domínguez et al. (2020), they suggest that these tools will continue to play a central role in improving reading comprehension. In view of this, Honorio-Meléndez et al. (2023) emphasise that ICT not only has an impact on meaningful learning, but also promotes pedagogical innovation, which opens up new opportunities for the design of educational strategies. Consequently, Salmerón & Villafuerte (2019; Berral-Ortiz et al. 2024), agree that reading practices enhanced by ICT and technological training programmes must be designed in such a way that they are adapted to the specific needs of students, thus guaranteeing their effectiveness.

CONCLUSION

The results obtained in this study show a very high positive correlation (Spearman's Rho = 0.944) and statistically significant ($p = 0.000$) between the use of Information and Communication Technologies (ICT) and reading comprehension in English in basic education students in Quito, Ecuador, which confirms that the use of ICT has a direct and favourable impact on the



development of reading skills in English, allowing us to accept the affirmative hypothesis (H1) and reject the null hypothesis (H0). The data supports the idea that ICT not only complements, but transforms traditional pedagogical practices, facilitating interactive, dynamic and personalised learning.

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CONFLICT OF INTEREST

There is no conflict of interest with people or institutions linked to the research.

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To students and their rights to an inclusive and quality education for meaningful learning.

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