

Exploring the benefits of information and communication technologies (ICT) and gamification in strengthening reading skills: a systematic review



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Abstract The aim of this study is to explore the potential benefits of utilizing Information and Communication Technologies (ICT) and gamification strategies to enhance the reading skills of students. The research employs a systematic review approach based on the adapted methodology of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). Relevant literature on ICT, gamification, and literacy skills published from 2013 to 2023 was identified from various databases including Dialnet, Scielo, Redalyc, Latindex, and Jurn. The findings suggest that gamification methods have the potential to increase interest in reading, and the use of ICT mediums such as e-books and reading apps can offer valuable opportunities for student engagement in reading activities. However, the study also underscores the challenges of implementing ICT, including ensuring equitable access to technology and the establishment of guidelines that balance screen time with other activities. In conclusion, the research posits that the integration of ICT and gamification strategies into approaches aimed at improving literacy skills and fostering reading motivation among children and young adults holds promising potential.

Keywords: competence, digital tools, engagement, literacy, students

1. Introduction

Reading Competence (RC) is a fundamental skill for all students as it encompasses the ability to understand and interpret written materials. Its importance in the academic field cannot be overstated, as it is indispensable for intellectual development and academic success. It is crucial to acknowledge that text comprehension is a complex psychophysiological process intricately tied to cognitive activity and language development throughout its progression.

Elleman and Oslund (2019) posit that during the process of developing Reading Competence (RC), various facets of the reader's cognition are engaged. Understanding a written text is influenced by various factors such as perception, emotions, attention, memory, interests, and comprehension of the environment. Vocabulary, sentence structure, and text comprehension also play a crucial role.

According to Cervantes et al (2017), being competent in reading is a complex skill. It involves comprehending the substance of the text, reading accurately without omitting, modifying, transposing, replacing, or distorting letters. Additionally, intoning punctuation marks expressively aids in the comprehension of the text.

Reading Competence (RC) is not limited to academics but is a vital tool for personal and social growth. It helps in acquiring knowledge beyond textbooks. The importance of improving reading skills at the individual level and in social interaction is so significant that education researchers are constantly looking for mechanisms and strategies to strengthen students' skills in this area.

Based on the above points, we can affirm that reading comprehension skills are fundamental for the individual to adapt to society. According to Flores and Gallego (2017), the importance of these skills is such that people who have difficulties in reading comprehension can be considered socially "maladapted". Moreover, it is estimated that these individuals may face multiple challenges regarding socialization and adaptation to their environment.

From the above, it follows that students who fail to develop their RC skills adequately are limited in their ability to acquire knowledge, which hampers their understanding of the academic world around them and their integration into it.

Current difficulties in Reading Competence (RC) in students can partly be attributed to the decrease in the relevance and prevalence of reading in society, as it is not considered a "fashionable" activity. As a result, students are likely to lack interest in literature, not use their home library or participate in literary meetings, contributing to a lack of motivation to read.

To address these difficulties, initiatives have emerged to develop didactic strategies using Information and Communication Technologies (ICT) to make reading more attractive to students. According to Fernández et al (2021), these



initiatives aim to improve reading skills, increase students' motivation and interest in reading, and ultimately strengthen their comprehension skills.

Gamification is one tool that uses Information and Communication Technologies (ICT) to achieve objectives in the Reading Competence (RC) field. Gamification aims to increase motivation, engagement, and student learning outcomes by making the learning process more enjoyable and interactive.

This article details how ICT and gamification have become tools of great importance in the educational context, especially in strengthening specific skills like reading competence. In this regard, these two tools' importance and future trends in the academic framework for improving RC will be argued. According to the existing scientific literature, the following research question is posed: What are the impacts of Information and Communication Technologies (ICT) and gamification on strengthening reading competencies in the educational context between 2013 and 2023?

Considering the above, one research hypothesis is that the literature points to gamification as part of ICT, increasing the interest and motivation of students towards reading, thus strengthening their reading competencies.

2. Materials and Methods

The methodological development was established from the interpretive paradigm, utilizing a qualitative approach and the design of a systematic literature review. This aimed to understand the impact of Information and Communication Technologies (ICT) and gamification on strengthening reading skills in the educational context through an in-depth exploration of existing scientific literature. This is based on the adaptation of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) methodology (Figure 1) (Urrútia and Bonfill 2010). The following was formulated concerning the research question: What are the impact of Information and Communication Technologies (ICT) and gamification on strengthening reading skills in the educational context, according to the existing scientific literature, between 2013 and 2023?

Considering the above, the systematic review of scientific literature, following the guidelines of Lame (2019), is presented to synthesize scientific evidence transparently and reproducibly in response to a specific research question. This approach aims to include all published evidence on the subject and evaluate its quality.

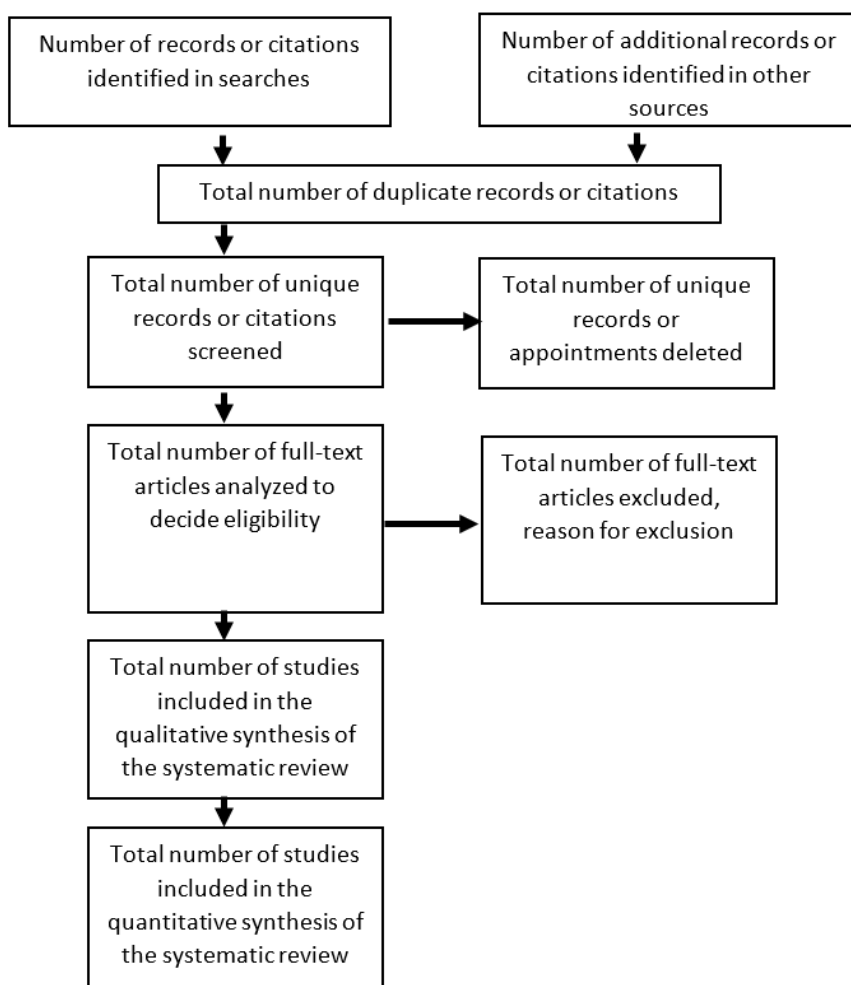


Figure 1 Information flow diagram through the different phases of the systemic review (Urrútia and Bonfill 2010)



In this regard, the systematic review of scientific literature (Lame 2019) is a transparent and reproducible method for synthesizing available evidence in response to a specific research question. This approach aims to include all published evidence on the subject and evaluate its quality.

In this sense, specialized databases such as Dialnet, Scielo, Redalyc, Latindex, and Jurn were selected due to their reputation and the variety of up-to-date scientific information. To determine the sample, a search criterion encompassed the period between 2013 and 2023, both internationally and nationally, and locally, and the inclusion of articles in English and Spanish was prioritized. Texts with a qualitative focus were chosen, which provided a detailed description of the relevant theoretical contributions, allowing for a comprehensive study on the importance of gamification and ICT in strengthening reading skills.

The collected information was systematized into a spreadsheet matrix consisting of ten columns as shown in a portion of this resource (Figure 2): Author(s) and Year of Publication, Title of the Study, Objective of the Study, Methodology, Sample Size and Participant Characteristics, ICT or Gamification Techniques Used, Measurement of Reading Competencies, Main Results, Study Limitations, and Observations/Comments.

	C	D	E	F	G	H	I	J
1	Objetivo del estudio	Metodología	Tamaño de la muestra y características de los participantes	TIC o técnicas de gamificación utilizadas	Medición de las competencias lectoras	Resultados principales	Limitaciones del estudio	Observaciones /Comentarios
2	Evaluar el impacto de la gamificación en las competencias lectoras de los estudiantes de secundaria	Experimento controlado	200 estudiantes de secundaria, edades 13-15	Juego de rol en línea diseñado para mejorar la comprensión lectora	Prueba estandarizada de competencia lectora	Los estudiantes que utilizaron el juego mejoraron significativamente en las pruebas de competencia lectora	Limitado a un solo juego, no se consideraron diferencias individuales de los estudiantes	Ninguno
3	Investigar el uso de TIC para mejorar las competencias lectoras en estudiantes universitarios	Estudio de caso	30 estudiantes universitarios, edades 18-22	Plataforma en línea de lectura y actividades de comprensión	Pruebas internas de competencia lectora y cuestionarios de autoevaluación	Los estudiantes informaron un aumento en la confianza lectora y mostraron mejoras en las pruebas de competencia lectora	Tamaño de la muestra pequeño, falta de grupo de control	Se sugiere investigación adicional con una muestra más grande y un diseño experimental

Figure 2 Database trimming for systematizing information for the literature review, adapted from Urrútia and Bonfill (2010).

3. Results and Discussion

To fulfill the established objective, which aims to explore the benefits derived from implementing Information and Communication Technologies (ICT) and gamification for strengthening reading competencies in students, this section begins with the presentation of descriptive information (Table 1). This presentation follows the recommended guidelines of the PRISMA method (Figure 1) and serves as an introduction to the subsequent stages of analysis and discussion.

Table 1 Descriptive information of the data systematization process.

Item	#
Additional records or citations identified in other sources	46
Record or citations identified in searches	67
Total of duplicate records or citations	38
Total of records or unique citations screened	48
Total unique records or appointments deleted	14
Total full-text articles excluded for not meeting the criteria	4
Total full-text articles analyzed to decide eligibility	32
Total studies included in the qualitative synthesis of the systematic review	30
Total studies included in the quantitative synthesis of the systematic review	30
Total studies reviewed	30

Source: based on the indications by Urrútia and Bonfill (2010) regarding the different phases of the systematic review.

Based on Table 1, the information enabled the organization of the identified aspects through structured topics using subtitles, and this is what is expanded and connected between results and discussion.



3.1. Relevance of reading skills in current education concerning ICT

To address the research question, it is crucial to highlight the relevance of reading skills in current education concerning ICT. According to the cited authors in this article, in an era of rapid technological evolution, reading skills (RS) remain as one of the most critical abilities that students must master. Competent reading has always been an essential skill in education; however, its significance is amplified in the context of ICT. As the world shifts towards digital media, literacy becomes more necessary than ever, making reading skills indispensable (Svensson et al 2021; Willems et al 2016).

3.2. Efficient navigation in the digital age and fundamentals of learning and critical thinking from RS

Based on the above, it can be argued that strengthening reading skills (RS) enables students to navigate efficiently through the vast amount of information available today. The internet, social media, and other ICT-based platforms provide immense data. However, without the ability to interpret and comprehend written texts, individuals can easily be misled by inaccurate or false information. Thus, possessing solid reading skills ensures that individuals can identify and evaluate reliable sources of information and make well-founded decisions.

Secondly, reading is a vital element of learning. Students heavily rely on written materials to acquire and understand new ideas, including digital resources, textbooks, curriculum manuals, and other study materials. Through RS, students can gain knowledge and develop critical thinking skills essential for lifelong learning (Alfonzo and Petro 2021; Calvo et al 2016). These skills are crucial for overall academic performance, and students with strong reading skills often outperform their peers who lack these abilities.

3.3. Fostering communication, creativity, and imagination through rs in the Digital Age

Furthermore, RS can enhance communication skills, especially in the digital era where communication is predominantly digital. Precise techniques of comprehension and interpretation enable students to understand instructions provided on various digital platforms, including emails, social media, blogs, and more (Catts et al 2015).

In this regard, reading skills can foster greater creativity and imagination. Through reading and ICT, students are exposed to a wide range of ideas, scenarios, and characters that allow them to develop different perspectives and modes of thinking. These creative skills lay the foundation for innovative problem-solving, enabling students to think critically and originally.

However, it is essential to emphasize that in the current context, reading skills are no longer sufficient as mere instruments for information dissemination. In today's highly digitalized world, where students primarily interact with digital media, the importance of reading skills has intensified. Developing specific reading skills for digital platforms and materials is crucial to ensure optimal understanding and assimilation of information.

Recognizing the role of Information and Communication Technologies (ICT) and gamification in strengthening reading skills, it is relevant to note that as society advances and becomes more technologically sophisticated, it is important to recognize the role that ICT and gamification can play in improving reading skills. This article explores the potential benefits these tools can provide to strengthen reading competencies.

A primary advantage of ICT in enhancing reading skills lies in its ability to provide a more appealing and dynamic learning environment. Multimedia elements such as audio, video, and gamification are often integrated into ICT-based platforms, serving to capture students' interest and render the learning experience more enjoyable.

In light of the perspectives offered by the reviewed authors, it can be asserted that gamification stands as an effective strategy for promoting reading. By introducing engaging elements, such as awarding points, badges, and leaderboards, gamification has the potential to elevate students' reading motivation. This approach is especially advantageous for reluctant readers or those who find traditional educational methodologies challenging.

Gamification is understood as a successful strategy to enhance specific reading skills. For example, games focusing on phonetics or frequently used words can help students rapidly identify and decode unfamiliar words. Games demanding participants make predictions or deductions can boost both reading comprehension and critical thinking abilities. However, it's vital to underscore that Information Technologies and gamification should not be seen as substitutes for traditional teaching methods or reading practice. Rather, it would be more beneficial to consider them as supplementary tools to enrich the learning experience and spur students' interest in reading.

However, the effectiveness of gamification in improving long-term learning and performance in reading skills has been a subject of debate. While some studies have reported improvements in reading skills, others have found minimal or no gains. Moreover, concerns have been raised that gamified interventions may undermine intrinsic motivation, as the provision of external rewards and incentives might diminish the inherent enjoyment and value of reading.

Upon reviewing the considered literature, it becomes evident that gaps exist in the research concerning the optimal design and implementation of gamified interventions to enhance reading skills. While some researchers have focused on developing specific games and platforms, others have explored using gamification principles in traditional reading instruction. Further research is needed to examine the effectiveness of different approaches and identify best practices for intervention design and implementation.

For example, ICT and gamification alone do not guarantee excellent reading skills. However, they are an ideal resource to promote such skills. The role of the teacher is crucial in planning objectives, content, methodology, activities, and materials evaluation (Jiménez 2018). Therefore, it is important to highlight that implementing technological resources in the classroom requires properly trained educational personnel. Hence, ICT and gamification are not the sole solution to students' problems but should be seen as strategic and educational tools, especially when used effectively.

3.4. *The importance of reading competencies in current education under ICT*

Possessing reading competencies is essential for success in education, professional career, and life in general (Willems et al 2016). As technology advances, these reading skills become crucial for acquiring knowledge and engaging in critical thinking. Therefore, the role of reading in contemporary education is irreplaceable. According to Svensson et al (2021), "a relatively high level of reading and writing is necessary to ensure competitive participation in society" (p.196).

In this context, reading is not limited to decoding words and sentences; it involves understanding, interpretation, and analysis. According to Catts et al (2015), students who develop strong reading competencies perform better in school, have higher self-esteem, and are more likely to succeed academically and professionally. Therefore, educators should prioritize teaching reading and supporting struggling readers to develop their skills.

In the current digital age, students are exposed to much information daily. Reading competencies are even more crucial to decipher internet content and distinguishing reliable information sources from deceptive ones. Capodiecì et al (2020) argue that reading competencies ensure students acquire information, process it critically, and participate in meaningful debates. In addition, reading contributes to developing skills in other subjects like science, technology, engineering, and mathematics.

The relevance of good command of reading competencies in students in today's education in the framework of ICT lies in that it promotes the development of vocabulary, a fundamental element of communication and understanding. According to Figueroa and Gallego (2021), a broad and varied vocabulary helps students understand complex texts, participate in deep discussions, and express their thoughts effectively. Thus, strong reading competence exposes students to diverse languages that help to broaden their vocabulary and, consequently, their knowledge (Canet et al 2013).

In various contexts, research like those conducted by González and Castro (2016) and Swart et al (2017) have examined the association between vocabulary and understanding. These studies have found that learners who experience difficulties in reading competencies have a more limited vocabulary than their counterparts with superior comprehension skills. It's important to highlight a reciprocal relationship between vocabulary and reading comprehension, which underscores that familiarity with word forms and meanings predicts the development of reading competencies, supporting the lexical quality hypothesis. Besides, it's been suggested that understanding is causally linked to word recognition and meaning processing (Perfetti and Stafura 2014).

Considering the contribution that reading competencies bring to modern education, it can be stated that technological advancements have significantly impacted the field of education in recent decades. Technology has now become an indispensable element of the teaching and learning process, as studies indicate that "ICT-infused learning experiences have proven to be highly motivating and effective for students" (Alfonzo and Petro 2021: 13). For instance, Calvo et al (2016) proposed "Lectonautas", a didactic reading strategy aimed at fostering reading competence in fourth and fifth-grade primary students. This initiative, which largely incorporates ICT tools, details how the use of technology in reading comprehension environments benefits students by enhancing their interaction, learning, idea generation, and creativity.

On the other hand, a study titled "Pedagogical strategy mediated by the use of ICT for the strengthening of reading comprehension in fifth-grade primary students", conducted by Ayala et al (2017) expanded the methodological spectrum by incorporating a virtual educational platform that facilitates access to resources for reading comprehension. This study was conducted to improve student's reading skills in different environments. The findings show a direct correlation between the use of technological tools and the improvement of reading skills. Therefore, it is imperative that students, as the central axis of the educational process, have innovative and flexible strategies to develop their reading skills with the support of ICT. These strategies should encourage them to learn and read in a different, attractive, and effective way, hence teachers face the challenge of creating a welcoming and supportive learning environment that fosters a love for reading.

Digital reading skills also allow students to navigate multiple online resources, evaluate their credibility, and distinguish between relevant and irrelevant information. Given the abundance of information available on the Internet, students must develop these skills to become informed and responsible digital citizens. Reading competencies are essential in developing communication skills, as they facilitate the effective articulation of thoughts and ideas. In addition, reading also enhances cognitive development by stimulating the brain and improving memory retention. Therefore, in the current digital age, reading competencies are not a luxury but a necessity for students to succeed in education and beyond.

3.5. *ICT and Gamification in Strengthening Reading Skills*

Due to the expansion of technology in various aspects of everyday life, understanding texts at school, at home during homework, and at work increasingly relies on various digital reading devices (computers, laptops, e-books, and tablets). In this

sense, Singer and Alexander (2017) argue that these can become essential support for improving traditional reading comprehension and learning skills.

Technology has had a significant impact on the way we learn and teach, particularly about reading. According to Yavuz et al (2020), in recent years, ICT and gamification have become powerful tools for enhancing students' reading skills. Various authors have studied the effectiveness of these tools, and some findings will be presented below.

A study by Castillo (2022) investigated the effect of gamification on reading skills. The researchers found that using games in reading instruction significantly improved students' reading skills. The study concluded that gamification could increase student engagement in reading-related activities and improve their overall performance.

Similarly, in his research on the development of reading skills in sixth-grade primary school children through a learning management system, Huacuja (2019) argues that the integration of Information and Communication Technologies (ICT) and gamification exercises within virtual workshops serve as a highly effective means to encourage student participation in class activities. From his findings, the author concludes that this approach facilitates a shift from a mechanistic and rudimentary interpretation of texts to a deeper engagement with the author's ideas, intentions, and themes, allowing students to use the texts for their purposes, such as participating in online forums and sharing comments with their peers, thus promoting lively discourse and collaborative learning.

On the other hand, Jiménez (2018) maintains that, when it comes to online educational tools, the teacher's role is essential to imbue them with educational meaning in the classroom. The teacher must possess technical, scientific, pedagogical, and humanistic knowledge and be able to utilize network resources adequately. In this context, the continuous training of educators and the improvement of their technological competence through computer materials adapted to students' learning needs to drive the objectives of this project.

In this regard, Area and González (2015) mention the challenges that education faces in the 21st century. They highlight the need to transform learning environments and teaching methods to adapt to the demands of the digital age. They point out the use of books or texts as mediators between the curriculum and teaching practice and propose a new approach to learning through gamification. This approach involves problem-solving situations with playful components and has implications for restructuring publishing industries and improving teaching-learning processes in schools. They also maintain that the use of ICT in educational environments and the development of meaningful experiences with the application of these technological tools benefit learning and the application of gamification in teaching-learning processes.

In this line of thought, Ansó (2017) emphasizes how incorporating digital games into the teaching-learning process is crucial for effective teaching practices in educational institutions and the successful implementation of technological tools. Additionally, he highlights the importance of continuous teacher training in effectively using and applying ICT. Therefore, it is necessary to consider this approach to enhance the development of teaching practices.

Similarly, Manzano et al (2021) explain how ICT tools and gamification can help engage students, improve their motivation for reading, and enhance their reading comprehension and vocabulary acquisition. The use of technology in teaching reading undoubtedly plays a crucial role in promoting literacy and empowering students in the coming years.

4. Final considerations

Effective Reading Competencies (RC) have become an indispensable part of contemporary education, significantly shaped by the proliferation of Information and Communication Technologies (ICT). These competencies facilitate students' navigation through the immense sea of online information and equip them with the necessary tools for critical interpretation and comprehension of data. This empowers them to discern the authenticity of the information, thereby avoiding deception. Furthermore, reading is inherently linked to learning, catalyzing effective communication, creativity, and critical thinking. Consequently, it is crucial that RCs, along with their digital counterparts, be persistently strengthened and refined within educational systems to adapt to the evolving digital landscape.

When reflecting upon the concepts and viewpoints of various scholars, the importance of reading skills in today's education—increasingly intertwined with ICT—becomes evident. The pivotal aspect lies in the undeniable potential benefits that ICT and gamification can bring to enhance reading skills. Integrating these innovative tools into the educational experience can significantly improve student engagement and motivation toward reading, address specific areas of improvement, and foster a more engaging and interactive learning journey. However, a balanced and cautious approach in employing these tools is essential to ensure they do not negatively impact other aspects of students' well-being and holistic development.

In the realm of modern education, RCs play an irreplaceable role. The digital age has brought about an exponential surge in the volume and diversity of information sources. Consequently, students must cultivate robust reading skills to critically process and analyze this information, enabling them to participate effectively in substantial discussions and debates. It is paramount that educators and educational institutions prioritize teaching reading, vocabulary development, and the establishment of support programs to ensure that students acquire the necessary skills for academic and professional success. As a society, our responsibility lies in acknowledging and promoting the critical role of reading in shaping informed, engaged, and productive citizens. Ultimately, the continuous enhancement of reading competencies within the context of ICT and gamification is crucial in equipping students to tackle the challenges of the 21st century.

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Ethical considerations

Not applicable.

Conflict of Interest

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References

- Alfonzo I and Petro E (2021) Aprendizaje invertido: herramienta TIC para el desarrollo de competencias lectoras en estudiantes de grado sexto. *Revista estudios en educación* 4:10-33.
- Ansó M (2017) Pedagogías lúdicas de innovación: buenas prácticas de enseñanza con juegos digitales. *Ciencias de la Educación*. Universidad de Extremadura. Available from: https://dehesa.unex.es/bitstream/10662/6319/1/TDUEX_2017_De_Anso-I.pdf
- Area M and González C (2015) De la enseñanza con libros de texto al aprendizaje en espacios online gamificados. *Education Siglo XXI* 33:15-38. DOI: 10.6018/j/240791
- Ayala M, Barón S, Romero A (2017) Estrategia pedagógica mediada por el uso de las TIC para el fortalecimiento de la comprensión lectora en estudiantes grado quinto de primaria de la Institución Educativa San Josemaría Escrivá de Balaguer sede Samaria. *Fundación Universitaria Los Libertadores, Facultad de Ciencias de la Educación*. Available from: <http://hdl.handle.net/11371/1575>
- Calvo L, Vargas V, Camperos M (2016) Lectoronautas. Una propuesta de la didáctica de la lectura desde la web. *Revista Logos; Ciencia & Tecnología* 7:14-27.
- Canet L, Burin D, Andrés M and Urquijo S (2013) Perfil cognitivo de niños con rendimientos bajos en comprensión lectora. *Anales de Psicología* 29:196-1005.
- Carrion E, Perez M, Gimenez (2021) E. ICT and gamification experiences with CLIL methodology as innovative resources for the development of competencies in compulsory secondary education. *Digital Education Review* 39:238-56.
- Catts H, Herrera S, Nielsen D, and Bridges M (2015) Early prediction of reading comprehension within the simple view framework. *Reading and Writing: An Interdisciplinary Journal* 28:1407-1425. DOI: 10.1007/s11145-015-9576-x
- Castillo L (2023) Using Genially Games for Enhancing EFL Reading and Writing Skills in Online Education. *International Journal of Learning, Teaching and Educational Research* 21:340-354.
- Cervantes R, Pérez J and Alanís M (2017) Niveles de comprensión lectora. Sistema Conalep: caso específico del plantel, de ciudad Victoria, Tamaulipas, en alumnos del quinto semestre. *Revista Internacional de Ciencias Sociales y Humanidades, Sociotam* 27:73-114.
- Capodiecì A, Cornoldi C, Doerr E, Bertolo L, Carretti B (2020) The Use of New Technologies for Improving Reading Comprehension. *Front Psychol* 11:751. DOI: 10.3389/fpsyg.2020.00751.
- Elleman AM and Oslund EL (2019) Reading Comprehension Research: Implications for Practice and Policy. *Policy Insights from the Behavioral and Brain Sciences* 6:3-11. DOI: 10.1177/2372732218816339
- Fernández JM, Montenegro M, Fernández J and Román P (2021) Impacto das TIC nas habilidades de escrita e leitura: uma revisão sistemática (2010-2020) *Texto Livre* e34055. DOI: 10.35699/1983-3652.2021.34055
- Figueroa S and Gallego J (2021) Relación entre vocabulario y comprensión lectora: Un estudio transversal en educación básica. *Revista Signo* 54:545- 375.
- Flores X, Gallego Y (2017) The impact of reading comprehension on socialization: a study. *J Educ Res*. 110:475-485.
- González K and Castro AM (2016) Factores cognitivos asociados a la comprensión lectora en niños cubanos de sexto grado. *Integración Académica en Psicología* 4:96-105.
- Huacuja C (2019) Adquisición de la competencia lectora a través de un Learning Management System en niños de sexto año de primaria. Puebla, México: Universidad Iberoamericana Puebla. Available from: <https://repositorio.iberopuebla.mx/bitstream/handle/20.500.11777/4244/Huacuja%20Rodr%c3%adguez%20Cesar.pdf?sequence=1&isAllowed=y>
- Lame G (2019) Revisiones sistemáticas de literatura: una introducción. *Actas de la Conferencia Internacional de Design Society sobre Diseño de Ingeniería* 1:1633-1642. DOI: 10.1017/dsi.2019.169
- Manzano A, Rodríguez J and Aguilar J (2021) Play and learn: Influence of gamification and game-based learning in the reading processes of secondary school students. *Revista de Psicodidáctica* 27:38-46. DOI: 10.1016/j.psicoe.2021.08.001

- Mejía J, Díaz A and Varela V (2022) Reflexiones sobre la noción de mediación en el contexto de la psicología y la comunicación: una mirada en clave de la complejidad. In: Meriño V, et al, editors. *Gestión del Conocimiento. Perspectiva Multidisciplinaria*. Santa Bárbara – Zulia – Venezuela: Fondo Editorial Universitario de la Universidad Nacional Experimental del Sur del Lago de Maracaibo Jesús María Semprum 44:243-258. DOI: 10.13140/RG.2.2.34957.20961
- Osorio Marín G, Díaz Téllez ÁS, Mejía Ríos J (2023) Escritura creativa para fomentar el aprendizaje significativo. Caso de la institución educativa Filadelfia (Caldas, Colombia), 2022. *Ciencia Latina Revista Científica Multidisciplinar* 7:5627-5654. DOI: 10.37811/cl_rcm.v7i1.4875
- Perfetti, C and Stafura J (2014) Word knowledge in a theory of reading comprehension. *Scientific Studies of Reading* 18:22-37.
- Singer, LM, and Alexander, PA (2017) Reading on Paper and Digitally: What the Past Decades of Empirical Research Reveal. *Review of Educational Research* 87:1007–1041. DOI: 10.3102/0034654317722961
- Swart N, Muijselaar M, Steenbeek E, Droop M, De Jong P and Verhoeven L (2017) Cognitive precursors of the developmental relation between lexical quality and reading comprehension in the intermediate elementary grades. *Learning and Individual Differences* 59:43-54.
- Svensson I, Nordström T, Lindeblad E, Gustafson S, Björn M, Sand C, Almgren/Bäck G and Staffan S (2021) Effects of assistive technology for students with reading and writing disabilities, *Disability and Rehabilitation: Assistive Technology* 16:196-208. DOI: 10.1080/17483107.2019.1646821
- Urrútia G and Bonfill X (2010) Declaración PRISMA: Una propuesta para mejorar la publicación de revisiones sistemáticas y meta-análisis. *Medicina Clínica* 135:507-511.
- Willems G, Jansma B, Blomert B and Vaessen A (2016) Cognitive and familial risk evidence converged: A data-driven identification of distinct and homogeneous subtypes within the heterogeneous sample of reading disabled children. *Research in Developmental Disabilities* 53:213-231. DOI: 10.1016/j.ridd.2015.12.018
- Yavuz F, Ozdemir E, and Celik O (2020) The effect of online gamification on EFL learners' writing anxiety levels: A process-based approach. *World Journal on Educational Technology: Current Issues* 12:62-70.