ARTIFICIAL INTELLIGENCE CHATBOTS IN LANGUAGE LEARNING FOR DISADVANTAGED POPULATIONS (MIGRANTS AND ABORIGINAL). STATE OF THE ART AND CHALLENGE

LOS CHATBOTS DE INTELIGENCIA ARTIFICIAL EN EL APRENDIZAJE LINGÜÍSTICO DE POBLACIONES DESFAVORECIDAS (MIGRANTES Y ABORÍGENES). ESTADO DE LA CUESTIÓN Y RETOS

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Resumen: Los últimos informes de las Naciones Unidas revelan profundas disparidades globales en los resultados educativos y los impactos sociales derivados de la accesibilidad a Internet. En Australia y el Caribe, comunidades vinculadas con Naciones colonizadoras, son las más marginadas debido a los efectos duraderos del colonialismo, lo que genera una importante brecha digital. Por el contrario, en España –como es típico en muchas naciones europeas– es la población migrante la que enfrenta los mayores obstáculos para el acceso a la educación. Este estudio busca explorar el impacto de la disponibilidad de Internet y los chatbots en el aprendizaje de idiomas entre las poblaciones desfavorecidas que participan en la educación temprana y primaria de idiomas en estas tres regiones, ya que la educación es fundamental para fomentar la inclusión, promover la movilidad social y garantizar el florecimiento de estas comunidades. Se realizó una revisión sistemática de la literatura científica indexada en Web of Science, SCOPUS y DIALNET, centrándose en publicaciones relevantes para el estudio. La metodología de investigación implicó el uso de dos factores booleanos relacionados con el enfoque del estudio. Los hallazgos indican una escasez de investigaciones sobre chatbots en la educación de idiomas para poblaciones desfavorecidas, a pesar de su prevalencia en los estudios de educación general con chatbots o chatbots para el aprendizaje de idiomas. El estudio aboga por la integración de la IA y los chatbots como catalizador para mejorar las habilidades lingüísticas entre los estudiantes más jóvenes y vulnerables de la escuela. El objetivo es abordar un doble desafío: avanzar en la investigación sistemática en el campo del aprendizaje inclusivo de idiomas y crear conciencia sobre el potencial de los chatbots para lograr el Objetivo de Desarrollo Sostenible 4 de las Naciones Unidas descrito en la Agenda 2030 de las Naciones Unidas: educación equitativa y de calidad para todo.

Abstract: The length will be 250 to 300 words in English. The latest United Nations reports reveal profound global disparities in educational outcomes and societal impacts stemming from internet

accessibility. In Australia and the Caribbean, First Nations communities are the most marginalized due to the lasting effects of colonialism, leading to a significant digital divide. Conversely, in Spain—and typical of many European nations—it is the immigrant population that encounters the greatest obstacles to educational access. This study seeks to explore the impact of internet availability and chatbots on language learning among disadvantaged populations engaged in Early and Primary Language Education across these three regions since education is pivotal for fostering inclusion, promoting social mobility, and ensuring the flourishing of these communities. A systematic review of scientific literature indexed in Web of Science, SCOPUS, and DIALNET was undertaken, focusing on publications relevant to the study. The research methodology involved using two Boolean factors related to the focus of the study. Findings indicate a scarcity of research on chatbots in language education for disadvantaged populations, despite their prevalence in general education studies with chatbots or chatbot for languages learning. The study advocates for integrating AI and chatbots as a catalyst for enhancing language skills among vulnerable most young learners in the school. The goal is to address a two-fold challenge: to advance systematic research in the field of inclusive language learning and to raise awareness of chatbots' potential in achieving the UN's Sustainable Development Goal 4 outlined in the UN's 2030 Agenda: equitable and quality education for all.

Résumé: Les derniers rapports des Nations Unies révèlent de profondes disparités mondiales en matière de résultats scolaires et les impacts sociaux de l'accès à Internet. En Australie et dans les Caraïbes, les communautés liées aux pays colonisateurs sont les plus marginalisées en raison des effets durables du colonialisme, créant une fracture numérique importante. À l'inverse, en Espagne, comme dans de nombreux pays européens, ce sont les migrants qui rencontrent les plus grands obstacles à l'accès à l'éducation. Cette étude vise à explorer l'impact de l'accès à Internet et des chatbots sur l'apprentissage des langues parmi les populations défavorisées participant à l'éducation linguistique dès la petite enfance et au primaire dans ces trois régions, car l'éducation est essentielle pour favoriser l'inclusion, promouvoir la mobilité sociale et assurer l'épanouissement de ces communautés. Une revue systématique de la littérature scientifique indexée dans Web of Science, SCOPUS et DIALNET a été réalisée, en se concentrant sur les publications pertinentes pour l'étude. La méthodologie de recherche a fait appel à deux facteurs booléens liés à l'objet de l'étude. Les résultats indiquent une pénurie de recherches sur les chatbots dans l'enseignement des langues pour les populations défavorisées, malgré leur prévalence dans les études d'enseignement général portant sur les chatbots ou les chatbots pour l'apprentissage des langues. L'étude préconise l'intégration de l'IA et des chatbots comme catalyseurs pour améliorer les compétences linguistiques des élèves les plus jeunes et les plus vulnérables. L'objectif est de relever un double défi : faire progresser la recherche systématique dans le domaine de l'apprentissage inclusif des langues et sensibiliser au potentiel des chatbots pour atteindre l'Objectif de développement durable n° 4 des Nations Unies, défini dans l'Agenda 2030 : une éducation équitable et de qualité pour tous.

Palabras Clave: Inteligencia Artificial; Lenguaje infantil y calidad educativa; Educación Infantil y Primaria; Chatbot.

Key words: Artificial intelligence; Childhood language and quality education; Childhood and primary education; Chatbot.

Mots clés: Intelligence artificielle; Langage des enfants et qualité de l'éducation; Petite enfance et éducation primaire; Chatbot.

INTRODUCCIÓN

The study presented contributes to an ongoing research line developed within a University Teaching Research Network at the University of Alicante titled: "Integration of the sustainable development goals (SDGs) for the fulfilment of the 2030 Agenda. Didactics for inclusive education". Two foreign universities are also part of this work to contrast perspectives and experiences across regions with diverse idiosyncrasies. By gathering

comparable results, it sheds light on the current educational landscape in different geographical contexts.

The main focus of this work is to achieve the sustainable development and 4th Goal (SDG) of the UN's 2030 Agenda, which aims to ensure inclusive, equitable, and quality education for all, with a particular emphasis on analysing educational integration in populations at risk of social exclusion. The study aims to explore the role of chatbot Artificial Intelligence (AI) as a tool to address social inequalities in the educational context in relation with language learning. Therefore, it examines the impact of chatbots on students' linguistic training, considering it a crucial element of the communication and social interaction process.

The study, which is part of an ongoing broader research project, concentrates on the language development of students in Early Childhood and Primary Education, L1 and L2, targeting the demographic of children aged 3 to 12 years, with special focus on language learning for the most disadvantaged.

The research is twofold: on the one hand, it evaluates the impact of communicative and interactive teaching strategies for the learning/acquisition of first or additional languages in schools for student integration, native or foreingers. These strategies are founded on active and meaningful participation, crucial for students' academic and societal growth (Pauwels, 2000; Culberston et al., 2013; Alcívar, 2023; Pozuelo, 2023; Esquivel & Azahuanche, 2021). On the other hand, it explores the integration of Artificial Intelligence (AI) chatbot in language pedagogy, considering its effectiveness as a supportive mechanism in the students' language learning process (Muñoz-Basols et al., 2024; Hernández, 2021).

The chatbot in the classroom (Ait Baha et al. 2023; Alzate, 2023; Chiu et al., 2023; Clarizia et al., 2023; Sarrazola, 2023) has been selected to identify the value and viability of using cognitive language learning through autonomous management provided by these platforms (Almazán et al., 2023; Lindín, 2024). Culbertson et al. (2013) have already applied computational techniques to learning by developing a cognitive bias model to demonstrate the findings of artificial grammar experiments. It is important to note that while AI is of great interest in the educational field, it also raises concerns and distrust (García-Peñalvo, 2023). This justifies the need for studies to demonstrate the advantages and disadvantages of implementing such systems successfully particularly in the context of children's learning and the children in the risk of exclusion.

Educational situation in Australia, Barbados (Caribbean) and Spain
The study compares the educational situations in Australia, Barbados (Caribbean), and Spain, considering the unique characteristics of these countries, such as their attitudes and

social customs. It focuses on the educational systems in these countries and contrasts the experiences of the privileged population with those who face socioeconomic inequalities and have fewer educational opportunities, particularly indigenous or migrant populations who have the lowest literacy rates. The study emphasizes the importance of addressing these differences through sociocultural and linguistic inclusion within schools and through teacher training (del Olmo et al., 2023, 2023a). Understanding and comparing the educational realities of different countries can help in designing more effective educational policies that align with UNESCO's guidelines 2015.

Selecting Barbados (Caribbean) for the study holds considerable significance. The Arias et al. (2023) report, titled *El estado de la educación en América Latina y el Caribe 2023*, underscores the persistent hurdles in formulating a more effective educational strategy. The authors argue for increased investment to improve quality, reduce failure rates, and ultimately diminish school dropouts. The report further reveals that educational expenditures are misaligned, with up to 17% excess in educational acquisitions, 14% in salary expenses, and a loss amounting to 0.27% of the GDP across Latin American and Caribbean nations due to mismanagement and wastage of resources. This misallocation has led to a scenario where heightened spending fails to translate into tangible improvements. Consequently, there is an imperative to reallocate funds towards proven factors that enhance educational standards, such as the employment of well-trained teachers, the provision of adequate educational resources, and the elimination of obstacles impeding access to education (2023, p. 2). The issues concerning the proper use and transparency of educational funds are further corroborated by the Global Education Monitoring Report (2023, p. 136) and are a recurring theme in scholarly works (Quershi et al., 2021; Adelman & Lemos, 2021).

In the other hand, according to the Global Education Monitoring Report (2023), Australia is recognized as a developed nation with a robust technological infrastructure supporting its educational system. However, Hersh and Mouroutsou (2019) highlight a significant limitation: while these advancements are accessible to English-speaking students, they are not readily available for speakers of Aboriginal languages (2023, p.39). Furthermore, research by Vass (2012) delves into the contentious discussions surrounding policies aimed at 'bridging the gap' between indigenous and non-indigenous students' educational outcomes. The conversation centres on the myriads of challenges faced by Australia's First Peoples, including social, emotional, educational, and economic disparities, in stark contrast to their non-indigenous peers (Bodkin-Andrews & Carlson, 2016).

In Spain, the educational gap focuses on migrants, who, like the indigenous people of the Caribbean and Australia, are the most disadvantaged population in the socio-educational sector. The intense migratory flow, especially on the coasts, makes inequalities and problems of educational inclusion as concerning as in the two previous cases (Ríos et al., 2021; González & León, 2020; Frades and Ureña, 2020). Spain's migratory balance in 2022, according to the National Institute of Statistics (INE, 2022), was the highest in 10 years, with an increase of almost eight hundred thousand registered people, that is, with a rate of 245.9% annual variation.

The 2020 Spanish Education Law places special emphasis on developing computational thinking skills and solving problems from the earliest educational levels (Ministry of Education and Vocational Training of Spain, 2022). However, like Australia and the Caribbean, not all schools have access to technology. Sicilia and Simancas (2023) conducted a study that provides information on the efficiency and equity of education in Spain in terms of productive performance and technological improvement. The authors highlight significant challenges due to inadequate infrastructure, limited teacher training, and unequal access to technological devices (such as tablets, computers, or mobile phones) and Internet connectivity among students.

Computer education and Internet monitoring in these countries.

The Global Education Monitoring Report indicates that learning losses were minimal or insignificant in Australia and Spain, where over 90% of the population has access to the Internet (2023, p. 224). Nevertheless, this digital access is not equally distributed across populations. In the Caribbean, internet accessibility stood at 85.8% in 2023. It is observed that households with members holding tertiary education degrees tend to have more reliable and higher-quality internet connections. They also incur greater data costs compared to other segments of the population. This disparity is highlighted in the United Nations report titled "Internet access and use in Latin America and the Caribbean" (2022). Given that educational attainment is closely linked to economic capacity and digital disparities, research underscores the imperative of broadening internet access and a more equitable use of technologies. This strategy is pivotal for promoting educational equity and, as a result, enhancing the integration of economically disadvantaged individuals into the digital world.

The article under discussion draws upon published data to shed light on the digital divide affecting certain demographics within these three countries. It posits that providing widespread internet access is crucial for establishing equitable educational opportunities. Furthermore, it advocates for the adoption of generative AI in educational settings,

particularly for language learning, which is essential for effective communication and progress. Additionally, it emphasizes the role of internet access as a vital catalyst for the socio-economic inclusion of individuals with limited financial resources.

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To take concrete action, the first step and the principal object of this study is to know the state of the art on studies about AI chatbots for school integration and inclusion of children with language acquisition problems in the schools. This will be a good catalyst for show the social and educational resonance of this issue.

METHOD/DEVELOPMENT OF THE INNOVATION EXPERIENCE

The article adopts a theoretical-critical framework, employing a descriptive-narrative qualitative methodology (Navarrete, 2011; Aguirre y Jaramillo, 2015; Sánchez, 2015; Ocaña y Reyes, 2017; Espinoza Freire, 2020; Rodríguez Ortiz, 2020). The narrative-descriptive methodology, in relation to the bibliographic search, has focused on describing and analysing the information available in the scientific literature on three platforms with a wide collection of bibliographic databases of scientific publications (*Web of Science-WOS, Scopus* and *Dialnet*), without applying a quantitative or statistical approach.

The method is based on three general phases: (i)*Systematic description*: the object of this study has been systematically searched and catalogued; (ii)*Collection and Analysis*: The relevant data has been collected from the 3 mentioned bibliographic platforms, and has been analysed to obtain a complete understanding of the topic. No meta-analysis has been performed nor statistical techniques have been applied; (iii)*Purpose*: through the narrative-descriptive methodology, a general and contextual vision of the topic under study has been sought, identifying trends and relevant characteristics of the publications between 2018 and 2024. In summary, this approach has been useful to obtain an overview of the existing literature without going into statistical detail.

In summary, this procedure has been useful to obtain a broad overview of the existing literature without going into statistical detail. This approach has been instrumental in establishing a method for the systematic collection, organisation and analysis of

information obtained from the aforementioned platforms. It has helped to effectively compile existing data, identify key authors, track publication trends, articulate central research themes and predict emerging perspectives within the field, as demonstrated by Gómez-Luna et al. (2014).

The implementation of this inductive method has ultimately allowed us to draw general conclusions about the literature finding linked to the impact of AI chatbot in school-aged children's language learning environments. By combining description, narrative and interpretation, a standard of validity is established, avoiding the inclusion of unfounded opinions or ideas. The methodology employed also strategically reduces the potential for bias within the systematic review. The results of the study will allow to evaluate the effect of the use of AI chatbots for language learning of learners at risk of educational and social exclusion, to assess their transformative effect on education. These elements relate to the areas of language instruction, pedagogy, and the role of chatbots as innovative disruptors in the educational landscape of the 21st century.

The study uses academic articles that are accessible through open access. The research methodology employs a dual-tiered criterion system, which includes general criteria (relevance, representativeness, and feasibility) and specific criteria (inclusion/exclusion parameters and heterogeneity) to identify the most relevant elements of the study.

The systematic review carried out across three different search platforms follows a rigorous methodological framework. This framework is based on a set of predefined search parameters designed to facilitate a careful selection process. The objective has been to ensure the inclusion of studies that are most significant for the research theme (Table 1).

Tabla 1. Inclusion criteria. Source: Own elaboration.

CRITERIA	INCLUSION CONCEPTS
DOCUMENT TYPE	Journal Articles & Chapter books
TIMELINE	2018-2024
LANGUAGE	Spanish & English
SUBJECT AREA	Chatbot & ChatGPT & Education (not Technology area)
TOPIC	Chatbot for learning languages (Early and Primary Education), migrants and aboriginal

Based on the three phases described above as a procedure and the criteria (Table 1), the research is described specifically in different stage:

— The initial phase of the study involved defining the *Boolean* search parameters and selecting appropriate platforms for implementation. The search results were then refined based on predetermined inclusion criteria (Table 1).

— The second phase, involved a detailed analysis of the selected articles' content, leading to the extraction of the most critical insights. This process was complemented by creating tables that effectively display the collected data.

— In the third phase the analysis, it is expected to serve as a foundational framework to develop strategies that promote the integration of chatbots in the teaching of native and additional languages in Early Childhood and Primary Education, with emphasis on inclusivity and school integration.

RESULTADOS

Following the analysis of the United Nations reports, the study started with a search for current research on three main bibliographic access platforms: Web of Sciences (WOS), Scopus and Dialnet. Only scientific works published in books and journals have been considered, excluding these or other academic works.

The primary search terms used were: "language acquisition/language learning", "chatbot or chat GPT", "Early Childhood and Primary Education". The main search terms used were: 'language acquisition/language learning', 'chatbot or GPT chat', 'Early Childhood and Primary Education'. The research focuses on the search in Education (Social Sciences), in no case does the research extend to the areas of new technologies or any topic linked to this context as a search filter. For this reason, it is quite possible that the results obtained, which are very scarce, have not been as expected.

Web of Science (WOS) platform

On the WOS platform, the Boolean asterisk factor [*] was used to filter results containing all search terms, regardless of order and position. Twenty-eight generic entries were found, which excluded the terms *Primary and Early Childhood Education', because the first step was to focus on the search for chatbot research in Language Learning Acquisition. Of them, only 11 relate to language learning or language studies with chatbots (Table 2).

Table 2. WOS. Systematic review (Chatbot & Language Learning Acquisition). Source: Own elaboration

	AUTHORS CITATION	SUMMARY OF MAIN FINDINGS
1	Chien, Y. C. et al. (2022).	This study is intended to create an innovative contextual English learning environment making use of the widely used communication software, LINE Chatbot, based on the Artificial Intelligence Markup Language (AIML), to improve speaking and listening ability among learners.
2	Jeon, J. (2023).	This study investigated the effect of Chatbot-Assisted Dynamic Assessment (CA-DA) on vocabulary learning and provided insights into learner abilities drawn from its implementation. Using mediating chatbots, this study implemented DA to multiple learners simultaneously and provided each learner with human-like interaction. The chatbots were created using Google's Dialog flow.
3	Kim, I. & Kim, B. (2020).	The purpose of this study is to explore the current state of interactive AI chatbot development, focusing on ICT based new technology trends, and suggest ways of applying this chatbot technology to develop English education chatbots. First, this study explains the major principles of AI-based interactive chatbot development in recent years.
4	Kim, H. et al. (2022).	The purpose of this article is to set out the design principles and architecture of a second language (L2) learning voice chatbot. Building on L2 acquisition theories and chatbot research, in this article, we report on a South Korean government-funded longitudinal project in which we designed and developed a chatbot called "Ellie". Chatbot Ellie has three chat modes, "General Chat," "Task Chat," and "Skills".
5	Liu, Q. et al. (2020).	The results of study conclude that the chatbot can serve as an effective information retrieval tool in a specific domain. The perceived usability of the chatbot tends to be moderate and marginal and has positively affected the promotion of chatbot for mobile learning. This paper contributes to the educative application of chatbots in specific subject fields.
6	Punar Özçelik & Yangın Ekşi (2024).	This study about language aims to address this research gap by examining the impact of ChatGPT, an AI-powered chatbot, on the acquisition of register knowledge across various writing tasks.
7	Shin et al. (2024).	The study, demonstrated that customized chatbots could offer CF when students made non-target utterances and elicit learner uptake successfully. Based on the innovation, they provide directions for pedagogy on chatbot-based language learning.

8	Tu, J. (2020)	The current study proposing a language learning chatbot with which one can practice in a simulated setting. The chatbot is based on the deep neural network and is trained by MultiWOZ and personal Chat collected in previous works.
9	Wu, C. H. et al. (2023)	The study aims to develop an interactive self-learning and self-improvement approach to improve the motivation and effectiveness of non-native English speakers. A chatbot-assisted learning environment is designed and evaluated, using a variety of concepts such as informal learning, language learning, and educational mobile application.
10	Zhang & Huang (2024)	The study demonstrates that employing an LLM-based AI Chatbot significantly helps students acquire both receptive and productive vocabulary knowledge during their second language learning journey. In particular, Chatbots contribute to long-term retention of productive vocabulary and facilitate incidental vocabulary learning.
11	Zhai & Wibowo (2022)	This study found that three dimensions such as cultural, empathetic and humorous dimensions have a positive influence on the application of AI L2 chatbots for enhancing learners' learning outcomes. This study also found that the development of an AI chatbot in L2 education has plenty of room for improvement. Several recommendations are made for enhancing the use of AI L2 chatbots which include integrating cross-cultural empathetic responses in conversational L2 chatbots.

To complete the search in WOS, the search focused on Early Childhood and Primary Education. As there were no relevant findings, these three elements had to be replaced by the generic word (school), as otherwise the search did not return any results, not even with the terms 'children' or 'child'. In the end, only 6 matches were obtained (Table 3). However, there is no overlap with studies on this topic but for migrant or aboriginal/indigenous children.

Table 3. WOS. Systematic review (Chatbot & Language Learning Acquisition & School). **Source: Own elaboration**

	AUTHORS CITATION	SUMMARY OF MAIN FINDINGS
1	Jayasinghe et al. (2021)	The study presents the eLearning, mobile applications have been developed for teaching Lexis to children. The market of educational mobile apps, especially for English language learning, has been rapidly growing. Especially in a country like Sri Lanka, English is not the mother tongue, it is the second language.
2	Leng et al. (2024)	Proposes the use of AI for children to learn and express language through the observation of images. The aim is to address challenges in children's language acquisition, such as language development delay, limited vocabulary, and poor expressive skills.
3	Liu et al. (2022)	This study thus aimed to understand the affordances of a chatbot built with artificial intelligence techniques as a book talk companion, and to explore the role of the interaction in students' engagement and interest in reading. Adopting AI techniques, the chatbot in this study had basic understanding of 157 books.
4	Liyane et al. (2022)	The article explained the situation of children are using smartphones and other technology devices, to play games, watch cartoons, take photos and sometimes the chance is getting higher than we think that children access unnecessary contents due to lack of guidance and unawareness of parents. This interactive mobile application is used as an adaptive learning tool for the primary school students.
5	Ruan et al. (2019)	Ther research group presented BookBuddy, a scalable virtual reading companion that can turn any reading material into an interactive conversation-based English lesson. We piloted our virtual tutor with five 6-year-old native Chinese-speaking children currently learning English. Preliminary results suggest that children enjoyed speaking English with our virtual tutoring chatbot and were highly engaged during the interaction.
6	Yuan, Y. (2023)	This experimental research examined the effectiveness of using chatbots in English as a Foreign Language (EFL) classrooms at a Chinese elementary school. The study provides valuable insights for integrating chatbots into language classrooms and suggests opportunities for further chatbot enhancements.

Scopus

In Scopus, the search engine is based on the same terminology ("chatbot", "language", "learning", "acquisition") but the Boolean factor, in this case, is marked by the conjunction [AND]. Only 1 result were obtained, the article of Zhang, Z., & Huang, X. (2024), already presented in WOS.

When terminology related to "school", "Early Childhood and Primary Education" is added to the search, 54 results are obtained for "Social Sciences" of which only 3 are relevant to the research (Table 4).

Table 4. Scopus. Systematic review (Chatbot & Language Learning Acquisition & School). Source: Own elaboration

	AUTHORS CITATION	SUMMARY OF MAIN FINDINGS
1	Lurvink & Pitchford (2023)	This paper investigates how this EdTech intervention might address some the challenges faced with primary education in Sierra Leone, by examining policy, teacher, and community perspectives.
2	Rulyansah et al. (2023)	The researchers found that teachers' collaborative skills (whether collaborations within or between schools or networks with other teachers and key stakeholders) were crucial to the success of GBP implementation. The findings can be used to improve pre-service and in-service teacher education and training, as teachers' game-based learning skills will increasingly form an important part of their professional tools.
3	Sharapat et al. (2022)	The general aim of this study is to analyse innovative ways of promoting linguistic competencies of primary education school students through mobile-assisted language teaching and select appropriate technologies.
3	Waldmann & Sullivan (2019)	The article explores the use of an action research case study intervention; shows how the introduction of mobile video chats for children learning a mother tongue creates the material conditions for the emergence of linguistic engagement and a participatory practice that fosters mother tongue learning in additional contexts.

As we have seen, in Scopus, the same search yielded some entries, but only a few were directly related to the study presented and none on the child population under study.

Dialnet

Dialnet, a portal managed by the University of La Rioja, was consulted, as it collects and facilitates access to scientific content in Spanish and Portuguese not available on other platforms, in relation to migrants as a phenomenon of linguistic non-inclusion in Spain. For the same search and with the same search terms as for the previous platforms ('acquisition/learning', 'language', 'chatbot', ChatGPT), 4 results were obtained (Table 5). Adding the search term 'pre-school and primary education' did not return any results, nor did using terms such as 'school' and 'children'. Logically, no results were found for children from migrant populations or children from colonised countries, just one, written by Villarrubia Zúñiga (2023). As there are few results, they are presented in a single next table (Table 5).

Table 5. Dialnet. Literature review. **Source: Own elaboration**

	AUTHORS CITATION	SUMMARY OF MAIN FINDINGS
1	Alenizi et al. (2023)	The results revealed that participants held moderate attitudes, perceiving ChatGPT as moderately effective with moderate barriers. While no significant differences were found between male and female teachers in attitudes and effectiveness, significant gender differences emerged in the future use of ChatGPT.
2	Mendoza (2023)	This article examines the potential of ChatGPT for learning Spanish as a second language at levels A1-B1 in terms of its ability both to decode the input of learners at these levels and to generate responses that can be understood by learners.
3	Pérez et al. (2020).	The study analysed two conversations with Cleverbot, a chatbot which, although not designed for ASL, is representative of the latest technological advances. The language used is Spanish, so this research also falls within the field of Spanish as a foreign language (ELE).
4	Villarrubia Zúñiga (2023)	This work focuses on ChatGPT as a chatbot application of artificial intelligence (AI), recently developed artificial intelligence (AI) chatbot application, recently developed (2022) and specialised in dialogue for implementing supervised linguistic learning. The work focusses in Childhood and Primary Education.

Results indicate a scarcity of empirical research on the efficacy of chatbots in facilitating language acquisition for communicative and inclusive purposes within Early Childhood and Primary Education. Additionally, there is a lack of theoretical exploration into the important aspects of using chatbots to improve language skills that are crucial for integrating migrant and Indigenous populations into the education system.

DISCUSION AND CONCLUSION

This research aimed to explore the integration of Artificial Intelligence (AI) chatbots in the language education of school-age children vulnerable to social exclusion and poverty.

No findings focus specifically on the topic, only on education or language education with children, and still with very few results. This therefore suggests emerging potential for AI chatbots to revolutionize language acquisition, communication and information interaction among school-aged children. What is observed is a notable benefit of AI chatbots in this context is their ability to create personalized and immersive learning experiences. However, the most significant aspect is its accessibility through mobile electronic learning applications, or m-learning, which takes advantage of the ubiquity of smartphones and tablets. The fundamental question, raised by García-Bullé (2019), is whether this approach represents a viable educational strategy for the 21st century.

Generative AI chatbots use advanced computational techniques to assimilate and generate new data through machine learning. This capability allows the chatbot to tailor interactions to each student's individual preferences, needs and interests. By interpreting and responding to human language in a manner similar to that of a real teacher, these chatbots offer a personalised educational experience. While they cannot fully emulate the nuanced role of a traditional educator, chatbots are a valuable educational supplement. In the case of children at risk of exclusion, with difficult access to school, they may be the only way to have a trainer. Their aim, then, is to reinforce retention and comprehension in language learning and other subjects, thus tackling problems such as school dropout, illiteracy and functional illiteracy.

Although they lack the ability to provide emotional, tutorial, human support for motivation and sense of engagement (key emotional competencies), AI chatbots represent a viable educational alternative for students who would otherwise have minimal or no access to education, particularly in regions with low literacy rates. The literature reviewed indicates that AI chatbots show promise in helping the students who are the focus of this study, particularly immigrants and indigenous people who face significant economic and social disparities.

Numerous critiques have highlighted the ethical concerns and technical-functional limitations of these tools; however, they remain a viable option for certain educational settings as a form of fundamental support or training. However, the deployment of this technology must be based on adequate initial training of educators to ensure its effective and safe application in pedagogical methods through existing applications. This becomes a challenge when trying to engage immigrant or indigenous communities, whether in developing countries or among refugee populations.

The expectation is that with ongoing advancements in Information and Communication Technology (ICT), generative AI chatbots will surmount their current technical and functional constraints. The anticipated outcome is a favourable influence on educational practices. The academic community is hopeful that AI will fulfil its potential in future educational endeavours, as suggested by Latif et al. (2023), with instructional designs, curricula, and assessments that promote an all-encompassing utilization of chatbots.

In research, there is great interest in designing and developing chatbots. This interest is evidenced in preliminary studies that conduct critical reviews to identify future research opportunities and highlight existing gaps, as shown by Luo et al. (2022). Similarly, the review carried out in this study has also identified such gaps but in another sense. Therefore, research on chatbots for language learning should critically evaluate how practical existing chatbots are in language education, whether for learning a first language or additional languages, similar to the approach taken by some scholars in this article. It is evident that language students prefer chatbots due to their adaptability and the feeling of trust they provide (Haristiani et al., 2019), as they are not evaluated by a conventional teacher. However, for children at risk of poverty it is not a matter of preference.

The pressing need for educational interventions in underserved communities calls for more innovative solutions, such as the "Bookbuddy" chatbot model introduced by Ruan et al. (2019). This model transforms digital content into interactive foreign language lessons via a voice chatbot, specifically designed for children. Additionally, Liu et al. (2022) explored the potential of an AI-powered chatbot as an interactive reading companion. Their study investigates how such interactions can enhance student engagement and interest in reading, acknowledging the impracticality of personal teacher-student discussions about every book read.

Furthermore, and although it is not found in the databases consulted, authors such as Topsakal and Topsakal (2022) have proposed a development framework for a language learning application that integrates Augmented Reality (AR), Voicebots and ChatGPT (a

sophisticated AI that uses a large language model) to offer a distinctive educational product that facilitates the use of foreign languages. learning for young children.

In conclusion, the study shows that although there is work on AI chatbots for language learning, it is not enough. Many studies found are oriented towards literature review, the impact on education in general or study the impact of the chatbot as a language learning tool for adults or young learners and not so much for children, let alone for children who need school integration for social inclusion. In addition, it has been seen that Asian countries are producing more research on this topic than the rest of the world, a factor that should be considered in another study to explain the cause.

Moreover, as Fryer et al. (2020) suggest, chatbots, although designed to serve as communicators, have not yet fully developed their potential as collaborators in foreign language teaching. The ultimate goal, as proposed by Raskar et al. (2022), is to develop chatbot assistants that not only help children with everyday tasks and provide guidance on their health and growth, but also facilitate the acquisition of communicative language skills. These skills are essential to foster educational and social development and promote inclusion.

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