

VADEMECUM OF ARTIFICIAL INTELLIGENCE TOOLS
APPLIED TO THE TEACHING OF LANGUAGESBelén Mateos-Blanco¹ , Eva Álvarez-Ramos^{1*} , Leyre Alejaldre-Biel² ,
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Abstract

A qualitative documentary research of software and multimedia artificial intelligences was chosen to enable the ontological understanding of the object of study that aims to explore the potential for learning through Artificial Intelligence (AI). Besides, it is shown how AI, as a novel component within the digital education landscape, contributes to educational technological capital. In light of our research area, the focus is on determining how AI can be harnessed to enhance the development of communicative competence. This entails identifying and categorizing AI tools relevant to language didactics. The sample size for this study is 120 AI applications, sourcing and compiling data on AI tools from specialized websites. This sample serves as a paradigm justifying a mixed-method study capable of combining quantitative and qualitative data.

The variables supporting this study consider four characteristics related to the specific typify of the digital tool in the pedagogical context. The first aspect pertains to the classification of generative AI tools with potential educational use. AI tools enriches and enhances the dimensions of learning underscoring the urgent need for literacy in this technology. The second variable was linked to the Pedagogical Competences of Teachers and the areas. The category in language education pertains to educators' ability to create, adapt, and employ digital resources that enhance language teaching and learning. The third and fourth identify the skills related to language learning. In the context of learning environments with AI tools, it is essential to contemplate the role of linguistic competence as subordinate to communicative competence.

Keywords – Artificial intelligence, Education, Language, Communicative competence.

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1. Introduction

The appearance of ChatGPT in November 2022 marked a turning point in what was previously understood as artificial intelligence (AI). A concept known to society, but one that felt distant in some

areas, such as education. The Generative AI tool ChatGPT has reached the educational community, causing the foundations of the educational system to shake and finally question the need to implement a deep structural and transversal change in what is currently understood as teaching and learning. The inclusion of AI in Education would mean facing two challenges eminently: on the one hand, the use of AI would generate new teaching methods, which is already being implemented in classrooms at all levels; and, on the other hand, Zapata-Ros indicates that we are facing a much more radical challenge: the creation of a completely new educational system, as a consequence of the implementation of AI (Zapata-Ros, 2023). This restructuring and rethinking of both the theoretical and practical bases of education bring to the forefront the need to digitally literate society in formal educational contexts and abandon the idea of citizens' self-literacy (Alejaldre & Álvarez, 2019; Esteve, 2015).

Despite the fact that students are considered digital natives (Prensky, 2001; Oblinger & Oblinger, 2005; Pedró, 2006, 2011; Gisbert & Esteve, 2011; Esteve, 2015) it is a reality that they have not received a formal education in digital literacy; in fact, they have learned to use certain digital devices and their functionalities without specific training, sometimes through trial-and-error and sometimes with the help of peers or video tutorials. As Alejaldre and Álvarez (2019) point out, the paradox arises when we place ourselves in another context, frequent in many classrooms, such as the presence of students who have learned to read on their own before starting formal education. However, in these cases, the idea of not continuing with the literacy plan in reading and writing that school curricula mark in their programs is not conceivable, so we should ask ourselves why digital literacy has not found its place in contemporary curricular plans. In addition, this perception of teachers' digital competence is not aligned with reality, since several authors agree that students do not necessarily arrive at university with an optimal (or at least minimally necessary) level of digital competence and, therefore, it will be essential to design and develop training and accreditation processes that allow us to demonstrate the level of this competence (Gisbert, Espuny & González, 2011; Gisbert & Esteve, 2011; González, Espuny & Gisbert, 2010).

With the irruption of Generative AI, it is even more urgent to provide the educational community with digital literacy training that, among other skills, equips the user with a series of tools that allow them to use Generative AI tools in the teaching and learning process in a way that promotes real learning experiences and that is not used for the opposite: to make an algorithm complete the student's work. Here arises the great dilemma that occupies many of the current discussions about the use or not of Gen AI in education, Jimenez, López, Martín, Romero & Serrano (2023) highlight that “the debate about the possible less appropriate uses of ChatGPT in university teaching has not been long in coming, especially with regard to the writing of academic papers. Can ChatGPT be included as a reference for writing an academic paper? Is it permissible to use ChatGPT to write an essay for a university paper? Can ChatGPT be included as a co-author of an academic or research paper?” (Jimenez et al. 2023: page 114). The aim of this research is to provide a set of AI Gen tools and associate them with the different competency areas detailed in the teacher and citizen digital competency frameworks. It is not intended to provide an exhaustive list of these tools, for which there are already interesting resources that are frequently updated (Agarwal, Gans & Goldfarb, 2022; Ebrahimi, 2023) or directories of AI tools, such as Futurepedia (<https://www.futurepedia.io/>) or All Things AI (<https://allthingsai.com/>), that attempt to reflect this overflowing evolution.

1.1. AI and Education

Many institutions and researchers are trying to envision a guide to integrate AI into education in a coherent way and without it being considered a threat, but just another tool. The Beijing Consensus document on Artificial Intelligence (UNESCO, 2019) aims to respond to the opportunities and challenges presented by AI in relation to education, putting forward 44 recommendations, grouped into different aspects that can help to understand the magnitude of the task: AI planning in education policy; AI for education management and delivery; AI to support teaching and teachers; AI for learning and learning assessment; developing values and competences for life and work in the AI era; AI to provide lifelong learning opportunities for all; promoting equitable and inclusive use of AI in education; gender-equitable

AI and AI for gender equality; and ensuring ethical, transparent and verifiable use of educational data and algorithms. These aspects are covered in more detail in *Artificial Intelligence and Education: A guide for policy makers* (UNESCO, 2021). As can be seen, the relationship between AI and education is complex and multifaceted.

The literature review reveals several recurring concerns regarding the inclusion of Generative AI in the formal educational framework, and, specifically in the language classroom. On one hand, studies that argue that an excessive use would imply the decrease of human traits in the teaching-learning process, such as “self-regulation, metacognition, goal orientation, planning, creative brainstorming and a variety of skills that could be negatively affected by automation or machine takeover” (Zapata-Ros, 2023: page 4) and lose control over the authorship of academic texts. On the other hand, the observation made by Jiménez et al. (2023) is quite intriguing as it points out that “if we do not integrate these tools in the classroom, we will be implicitly recognizing only their illicit uses and subtly favoring that students access them to misuse them” (Jiménez et al., 2023: page 120).

1.2. Communicative Competence and Digital Competence

The processes of teaching and learning aim to achieve communicative competence, which, as asserted by Hymes, teaches us “when to speak, when not to, and as to what to talk about with whom, when, where, in what manner” (Hymes, 1972: page 277). Communicative competence encompasses various interrelated competences, of which we have selected three for this study: linguistic, sociolinguistic, and pragmatic. In language teaching, the goal is not only to attain the target language; the process also aims to communicate effectively, reflect on language use and communication mechanisms, and ultimately understand the impact of culture and its references on language and communication (Dolz, Gagnon & Mosquera, 2009).

On the other hand, digital competence should be understood as “the critical and secure use of Information Society Technologies for work, leisure, and communication. Relying on basic ICT skills: the use of computers to retrieve, assess, store, produce, present, and exchange information, and to communicate and participate in collaboration networks via the Internet” (Rec. 2006/962 of the Parliament and the Commission, December 18) (Diario Oficial de la Unión Europea, 2006: page 16). The role of educators leads them to develop their digital competence beyond what is necessary for life. As facilitators of learning, they must acquire “specific digital competences of educators that allow them to use digital technologies effectively for teaching” (Redecker & Punie, 2017: page 15).

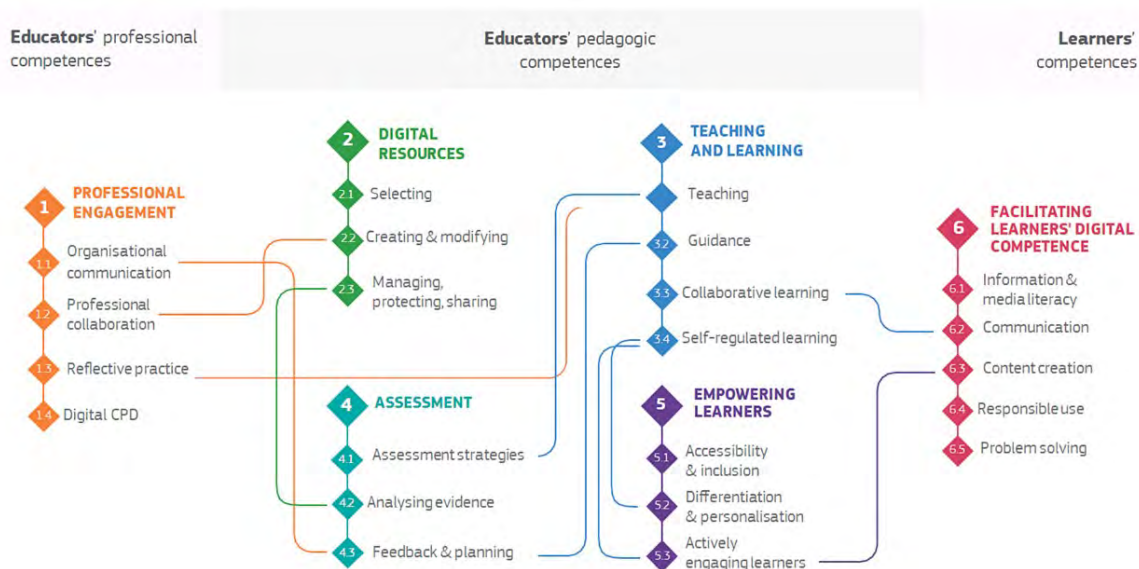


Figure 1. The DigCompEdu Competencies and Their Connections (Redecker & Punie, 2017: page 16)

DigCompEdu describes 22 competences organized into six areas, four focused on the development of educators' pedagogical competences: Digital Resources, Teaching and Learning, Assessment, and Empowering Learners. Thus, educators must be equipped to search for information and exchange digital content, as well as create them. It is also essential to have the ability to manage and organize the use of technology in teaching and learning processes. Similarly, technology provides digital strategies that can help improve assessment, not forgetting its use as a tool to facilitate the inclusion and engagement of students in their own learning (Redecker & Punie, 2017).

2. Methodology

2.1. Objectives

The objectives of this study align with the research framework established by Wang and Cheng (2021) and seek to further develop and specify them within the domain of specific didactics, in accordance with the recommendations outlined by UNESCO in its document 'Artificial Intelligence and Education: A Guide for Policymakers' (UNESCO, 2021). Consequently, this paper explores the potential for learning through Artificial Intelligence (AI) and how AI, as a novel component within the digital education landscape, contributes to educational technological capital (Casillas, Ramírez & Ortiz, 2014). In light of our research area, our focus is on determining how AI can be harnessed to enhance the development of communicative competence. This entails identifying and categorizing AI tools relevant to language didactics.

2.2. Theoretical Framework

A qualitative documentary research of software and multimedia artificial intelligences has been chosen to enable the ontological understanding of the object of study. Although all documentary research is a complicated process, at present, due to the vertiginous ebullition of technology and its constant updating, as well as the plurality of studies on the subject (García-Peñalbo, Llorens-Largo & Vidal, 2024), which requires sufficient knowledge to be able to discriminate the valuable information from the residual (Martínez-Corona & Palacios-Almón, 2019), the chosen typology of analysis is the most relevant to the proposed objectives.

Its approach is understood through the double aspect indicated by Barraza (2018) for any documentary study: an initial one that collects, selects, taxonomizes and relates the data extracted from different sources and a later one that aims to give a systematic and evaluative vision of the results obtained. The identification of AI applications that are or may be susceptible to use in education contains information relevant to the topic of study and, although it is understood as an investigation in itself when approaching the object studied (Manheim & Rich, 1998; Cardona, 2002; Boote & Beile, 2005), we go one step further by qualitatively analyzing the results obtained. We are facing a functional review (Colás & Buendía, 1998) that brings us closer to the state of the problem and its object of study in an evaluative way.

2.3. Procedure

For the documentary analysis process, the phases dictated by various researchers have been taken into account (Tobón, Guzmán, Silvano-Hernández & Cardona, 2015; Martínez-Corona & Palacios-Almón, 2019; Román-Acosta, Aniceto-Vargas, & Román-Julián, 2021): 1. Identification of articles and books in scientific databases. 2. Selection of essential and complementary words. 3. Establishment of selection criteria based on chronology and relevance and 4. Classification of information into analysis categories.

First, we conducted a comprehensive review of the current state of the art by examining scientific literature and publications within the institutional framework. Subsequently, we sourced and compiled data on AI tools from specialized websites, such as <https://www.futurepedia.io/> and <https://allthingsai.com/>. Additionally, we consulted reports from the Stanford Institute for Human-Centered Artificial Intelligence (HAI) to identify key players in AI development, extending beyond industry giants like Google, Amazon, and Microsoft.

After a meticulous and rigorous data cleaning and clarification process, we were able to incorporate a substantial number of tools into our corpus. In parallel, an examination of profiles and specialized social network pages yielded valuable insights into the practical applications of AI in educational contexts.

In any case, the selection criteria mentioned by Extremerño and Moscoso (1998) have been respected in favor of quality control in the indexing of documents in any database: consistency, relevance and exhaustiveness. To this initial triad we found it appropriate to add a fourth criterion due to the digital nature of the object of study: current events (Rodríguez, 2013).

2.4. Research Tools

Collected data has been organized into a file that, in addition to serving as a comprehensive library of AI applications, validates its utility as a resource for education. Furthermore, the file establishes competency categories that influence and hold both participants in the teaching and learning process accountable within the parameters defined by variables implicit in language didactics. The list of AI can be found in the table below.

Tools	Tool Category	Pedagogical competencies of educators	Competence	Associated AI Capabilities
ActiveCampaign	Text Generation	Digital Content	Linguistic	Read, understand and produce texts
Adobe Firefly	Image Generation	Digital Content	Linguistic	Read, understand and produce texts
Adrenaline	Source Code Generation	Evaluation and Feedback	Linguistic	Read, understand and produce texts
AICommand	Generation of 3D Objets	Digital Content	Pragmatic	Read, understand and produce texts
AI Text Classifier	AI Generated Text Detection	Evaluation and Feedback	Linguistic	Read, understand and produce texts
Amazon CodeWhisper	Source Code Generation	Evaluation and Feedback	Linguistic	Read, understand and produce texts
Answer the public	Text Generation	Teaching and Learning	Pragmatic	Rhetorical impact
Anthropic	Text Generation	Teaching and Learning	Linguistic	Initiating, maintaining, and concluding conversations
AudioLM	Audio Generation	Teaching and Learning	Sociolinguistic	Ability to understand spoken messages
Bard	Text Generation	Teaching and Learning	Linguistic	Initiating, maintaining, and concluding conversations
Bardeen	Text Generation	Digital Content	Linguistic	Read, understand and produce texts
Bing Image Creator	Image Generation	Digital Content	Linguistic	Read, understand and produce texts
Book creator	Text Generation	Digital Content	Linguistic	Read, understand and produce texts
Bradwatch	Text Generation	Digital Content	Sociolinguistic	Emotion analysis
Brainly	Text Generation	Teaching and Learning	Linguistic	Read, understand and produce texts
ChatBA	Image Generation	Teaching and Learning	Pragmatic	Read, understand and produce texts
ChatGPT	Text Generation	Teaching and Learning	Linguistic	Initiating, maintaining, and concluding conversations
ChatPDF	Text Generation	Digital Content	Pragmatic	Read, understand and produce texts

Tools	Tool Category	Pedagogical competencies of educators	Competence	Associated AI Capabilities
ChatPDF	Text Generation	Teaching and Learning	Sociolinguistic	Read, understand and produce texts
ChatSonic	Text Generation	Teaching and Learning	Linguistic	Initiating, maintaining, and concluding conversations
Claude	Text Generation	Teaching and Learning	Linguistic	Initiating, maintaining, and concluding conversations
ClosersCopy	Text Generation	Digital Content	Sociolinguistic	Initiating, maintaining, and concluding conversations
Code GPT	Source Code Generation	Evaluation and Feedback	Linguistic	Read, understand and produce texts
Codeium	Source Code Generation	Evaluation and Feedback	Linguistic	Read, understand and produce texts
Colossyan	Video Generation	Teaching and Learning	Sociolinguistic	Real-Time Translation
Conker	Text Generation	Evaluation and Feedback	Linguistic	Read, understand and produce texts
Consensus	Text Generation	Teaching and Learning	Sociolinguistic	Read, understand and produce texts
Copilot	Text Generation	Teaching and Learning	Sociolinguistic	Read, understand and produce texts
Copy.ai	Text Generation	Digital Content	Linguistic	Read, understand and produce texts
Copyleaks	AI Generated Text Detection	Evaluation and Feedback	Linguistic	Initiating, maintaining, and concluding conversations
CopySmith	Text Generation	Digital Content	Linguistic	Initiating, maintaining, and concluding conversations
Coqui	Audio Generation	Digital Content	Sociolinguistic	Emotion analysis
Cortex	Text Generation	Digital Content	Sociolinguistic	Emotion analysis
Craiyon	Image Generation	Digital Content	Linguistic	Read, understand and produce texts
DALL-E 2	Image Generation	Digital Content	Linguistic	Read, understand and produce texts
Decktopus	Image Generation	Teaching and Learning	Pragmatic	Read, understand and produce texts
Deep Dream generator	Image Generation	Digital Content	Sociolinguistic	Cultural Awareness Translation
Deepmind	Text Generation	Student Empowerment	Pragmatic	Initiating, maintaining, and concluding conversations
Dream by Wombo	Image Generation	Digital Content	Linguistic	Read, understand and produce texts
DreamFusion	Generation of 3D Objects	Digital Content	Linguistic	Speech-to-text
EdPuzzle	Text Generation	Digital Content	Pragmatic	Speech-to-text
Elicit	Text Generation	Teaching and Learning	Linguistic	Read, understand and produce texts
Fliki	Video Generation	Teaching and Learning	Sociolinguistic	Speech-to-text
Frase	Text Generation	Digital Content	Linguistic	Initiating, maintaining, and concluding conversations
Gencraft	Video Generation	Digital Content	Linguistic	Speech-to-text
GET3D	Generation of 3D Objects	Digital Content	Sociolinguistic	Speech-to-text
GetResponse	Text Generation	Digital Content	Linguistic	Read, understand and produce texts

Tools	Tool Category	Pedagogical competencies of educators	Competence	Associated AI Capabilities
Ghostwriter	Source Code Generation	Evaluation and Feedback	Linguistic	Read, understand and produce texts
Github copilot	Source Code Generation	Evaluation and Feedback	Linguistic	Read, understand and produce texts
Glasp	Source Code Generation	Evaluation and Feedback	Pragmatic	Read, understand and produce texts
Google Workspace	Text Generation	Teaching and Learning	Pragmatic	Read, understand and produce texts
GPT for Slides	Image Generation	Teaching and Learning	Pragmatic	Read, understand and produce texts
GPTZero	AI Generated Text Detection	Evaluation and Feedback	Linguistic	Initiating, maintaining, and concluding conversations
HeyGen	Video Generation	Teaching and Learning	Sociolinguistic	Read, understand and produce texts
Hour one	Video Generation	Digital Content	Linguistic	Speech-to-text
HubSpot	Text Generation	Digital Content	Linguistic	Read, understand and produce texts
Hugging face	Text Generation	Teaching and Learning	Linguistic	Initiating, maintaining, and concluding conversations
Humata	Text Generation	Teaching and Learning	Linguistic	Read, understand and produce texts
Imagen video	Video Generation	Digital Content	Linguistic	Speech-to-text
Imagine 3D	Generation of 3D Objets	Digital Content	Linguistic	Read, understand and produce texts
Jasper	Text Generation	Digital Content	Linguistic	Initiating, maintaining, and concluding conversations
Leap	Image Generation	Digital Content	Linguistic	Read, understand and produce texts
Lexalytics	Text Generation	Student Empowerment	Pragmatic	Emotion analysis
Listnr	Audio Generation	Teaching and Learning	Sociolinguistic	Speech-to-text
Lovo	Audio Generation	Digital Content	Sociolinguistic	Speech-to-text
MailChimp	Text Generation	Digital Content	Linguistic	Rhetorical impact
Make a video	Video Generation	Digital Content	Linguistic	Speech-to-text
Microsoft 365 Copilot	Text Generation	Digital Content	Pragmatic	Read, understand and produce texts
Microsoft Bing	Text Generation	Teaching and Learning	Pragmatic	Read, understand and produce texts
Midjourney	Image Generation	Digital Content	Linguistic	Read, understand and produce texts
Monic	Text Generation	Teaching and Learning	Linguistic	Initiating, maintaining, and concluding conversations
MonkeyLearn	Text Generation	Digital Content	Pragmatic	Personalized Messages
Murf.ai	Audio Generation	Teaching and Learning	Sociolinguistic	Speech-to-text
Netbase Quid	Text Generation	Digital Content	Sociolinguistic	Emotion analysis
NightCafe	Image Generation	Digital Content	Sociolinguistic	Read, understand and produce texts
Notion	Text Generation	Teaching and Learning	Linguistic	Read, understand and produce texts
Openai	Text Generation	Teaching and Learning	Linguistic	Initiating, maintaining, and concluding conversations
Otter	Audio Generation	Teaching and Learning	Sociolinguistic	Speech-to-text

Tools	Tool Category	Pedagogical competencies of educators	Competence	Associated AI Capabilities
Peppertype.ai	Text Generation	Digital Content	Pragmatic	Personalized Messages
Perplexity	Text Generation	Teaching and Learning	Pragmatic	Read, understand and produce texts
Play.ht	Audio Generation	Digital Content	Sociolinguistic	Speech-to-text
Podcastle	Audio Generation	Digital Content	Linguistic	Ability to understand spoken messages
Quillbot	Text Generation	Teaching and Learning	Linguistic	Grammar and spelling
Replika	Audio Generation	Teaching and Learning	Sociolinguistic	Rhetorical impact
Resume Builder	Text Generation	Teaching and Learning	Linguistic	Read, understand and produce texts
Rytr	Text Generation	Digital Content	Linguistic	Read, understand and produce texts
SciSpace	Text Generation	Teaching and Learning	Linguistic	Read, understand and produce texts
Scite Assistant	Text Generation	Teaching and Learning	Sociolinguistic	Read, understand and produce texts
Simplified	Text Generation	Digital Content	Linguistic	Read, understand and produce texts
SlidesAI	Image Generation	Teaching and Learning	Pragmatic	Read, understand and produce texts
Smart Compose	Text Generation	Teaching and Learning	Pragmatic	Rhetorical impact
Socialbakers	Text Generation	Digital Content	Pragmatic	Read, understand and produce texts
Sprinklr	Text Generation	Teaching and Learning	Pragmatic	Ability to understand spoken messages
Stability.ai	Text Generation	Student Empowerment	Sociolinguistic	Ability to understand spoken messages
Stable Diffusion Online	Image Generation	Digital Content	Linguistic	Read, understand and produce texts
Starryai	Image Generation	Digital Content	Linguistic	Read, understand and produce texts
Stockimg	Image Generation	Digital Content	Linguistic	Read, understand and produce texts
Surfer SEO	Text Generation	Digital Content	Linguistic	Read, understand and produce texts
Synthesia	Video Generation	Digital Content	Sociolinguistic	Personalized Messages
Tactiq	Text Generation	Teaching and Learning	Linguistic	Speech-to-text
Talkwalker	Text Generation	Teaching and Learning	Sociolinguistic	Rhetorical impact
Tavus	Video Generation	Digital Content	Sociolinguistic	Personalized Messages
Text2SQL	Source Code Generation	Evaluation and Feedback	Linguistic	Read, understand and produce texts
TextCortex	Text Generation	Teaching and Learning	Sociolinguistic	Initiating, maintaining, and concluding conversations
TinyWow	Text Generation	Digital Content	Linguistic	Read, understand and produce texts
Tome.ai	Image Generation	Digital Content	Linguistic	Read, understand and produce texts
Transkriptor	Audio Generation	Teaching and Learning	Sociolinguistic	Speech-to-text
Trinka	Text Generation	Teaching and Learning	Linguistic	Grammar and spelling
Turnitin	AI Generated Text Detection	Evaluation and Feedback	Linguistic	Read, understand and produce texts

Tools	Tool Category	Pedagogical competencies of educators	Competence	Associated AI Capabilities
Twee	Text Generation	Teaching and Learning	Sociolinguistic	Read, understand and produce texts
Visual ChatGPT	Image Generation	Digital Content	Linguistic	Initiating, maintaining, and concluding conversations
Voicemaker	Audio Generation	Digital Content	Sociolinguistic	Speech-to-text
Voicemod	Audio Generation	Digital Content	Sociolinguistic	Real-Time Translation
Voicera	Audio Generation	Teaching and Learning	Sociolinguistic	Online Dictionary
Wellsaid	Audio Generation	Teaching and Learning	Sociolinguistic	Speech-to-text
Wordtune	Text Generation	Teaching and Learning	Linguistic	Grammar and spelling
Writesonic	Text Generation	Digital Content	Linguistic	Read, understand and produce texts
Writesonic	Text Generation	Digital Content	Sociolinguistic	Speech-to-text
You	Text Generation	Teaching and Learning	Pragmatic	Initiating, maintaining, and concluding conversations
YouTubeDigest	Video Generation	Teaching and Learning	Linguistic	Speech-to-text

Table 1. Research Data

2.5. Variables

The variables underpinning this study consider four aspects related to the specific characterization of the digital tool in the pedagogical context. The first aspect pertains to the classification of generative AI tools with potential educational use as proposed by Morales-Chan (2023), which distinguishes between text generation, image, video, 3D object generation, audio, source code generation, and tools designed for the detection of AI-generated text. Furthermore, the assessed resources have been linked and categorized within the Digital Teaching Framework (Redecker & Punie, 2017), specifically with the Pedagogical Competences of Teachers and the areas defining digital content (2), teaching and learning (3), assessment and feedback (4), and student empowerment (5). The last two categories identify the skills related to language learning. On one hand, those specified in the Common European Framework of Reference for Languages (Consejo de Europa, 2002), such as linguistic, sociolinguistic, and pragmatic competences – i.e., communicative competence. On the other hand, they encompass the skills associated with key language competences and AI capabilities as defined by Tuomi (2018): reading, understanding, and producing texts; speech-to-text; initiating, maintaining, and concluding conversations; emotion analysis; rhetorical impact; personalized messaging; oral message comprehension; grammar and spelling; real-time translation; automatic translation with cultural awareness; and online dictionaries.

3. Results

Initially, the analysis aimed to categorize the 120 AI tools within the corpus based on the framework proposed by García-Peñalvo et al. (2024), serving as a paradigm justifying a mixed-method study capable of combining quantitative and qualitative data. Before proceeding with the examination of the references, it is pertinent to clarify that, in all variables open to analysis, the value and prevalence of certain items have been scrutinized against others to achieve precise conclusions. The educational ecosystem, recognizing the functional and reciprocal nature of AI-based tools, enriches and enhances the dimensions of learning (Gubareva & Lopes, 2020; Gašević, Dawson & Siemens, 2015; Gašević, Siemens & Sadiq 2023), underscoring the urgent need for literacy in this technology.

3.1. AI Tools

The most common tools are those related to text generation (62 cases), followed by those used to create images (18), audio (14) and video (10). Artificial intelligence tools that promote Source Code Generation or Generated Text Detection are in the minority (8 and 4 cases, respectively).

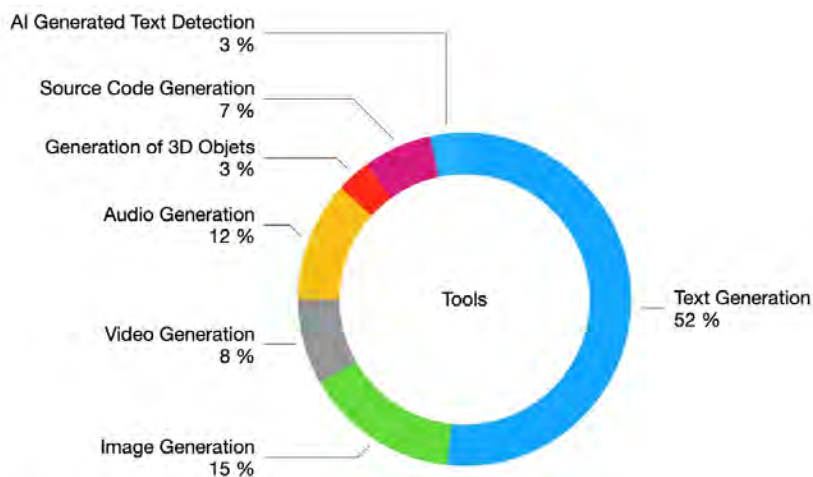


Figure 2. AI tools

Special mention deserves the supremacy of textual generation over the rest of the tools. Its quasi-tyrannical positioning surpasses the midpoint. Timidly follows image generation with 15% of tools focused on its production. In any case, word and image tools are the most offered by AI, although with a considerable difference in weight.

3.2. Communicative Competences

When looking at the communicative competences of the language described in the Common European Framework of Reference for Languages: linguistics, pragmatics and sociolinguistics, the development of linguistics prevails with 54.2% of the cases obtained. Sociolinguistic competence is at a lower level, with almost 29%. Examples of AI focused on the development of pragmatic competence represent only 17.5% of the total. Below, it's presented the specific number of cases that fall within each of the communicative competences outlined by the Common European Framework. As depicted in the graph, instances of tools related to grammatical or linguistic competence double those of sociolinguistic competence and triple those of pragmatic competence.

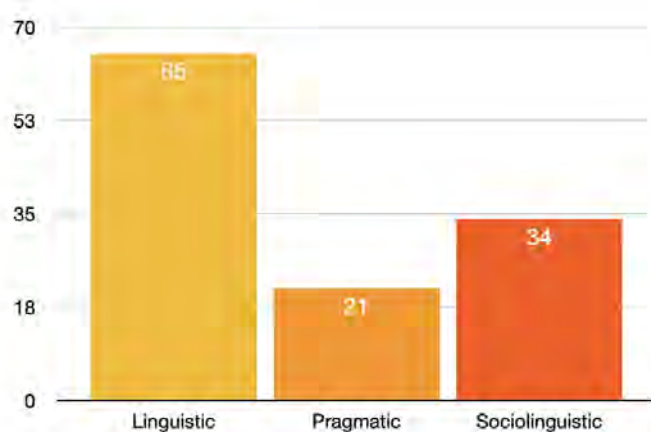


Figure 3. Linguistic, sociolinguistic and pragmatic competences

3.3. Associated AI Capabilities

The results regarding the skills associated with IAs show an extreme supremacy of reading, comprehension and text production (57%). Close to 20% is the ability to Initiate, Hold, and Conclude Conversations. The presence of the rest is merely testimonial.

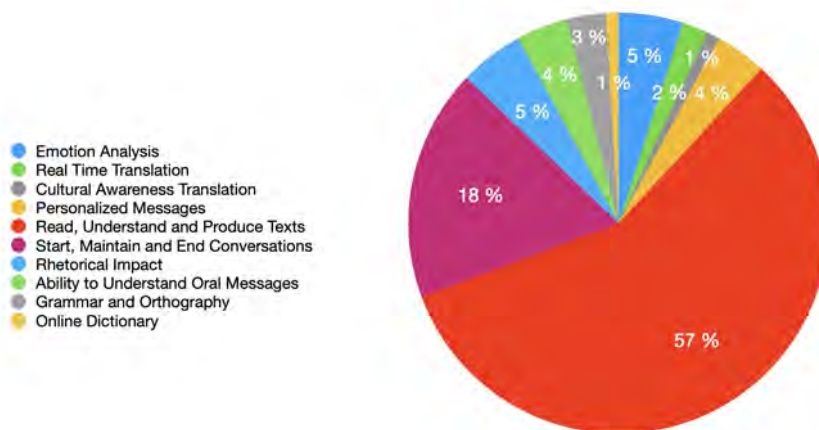


Figure 4. Associated AI Capabilities

In the extracted data, written skills prevail over oral skills, perhaps stemming from the historical belief derived from a grammatical approach that written language truly manifests linguistic knowledge. The characteristics of written expression, in contrast to orality, require a higher level of language proficiency and a more precise use of language. Unlike the fluidity of oral language, which allows for immediate correction and informal speech realizations, a preference for simplicity emerges, acknowledging spontaneity that permits errors or hesitations as communication unfolds in real-time. In contrast, written language demands greater correctness, enabling a more sophisticated register due to its non-immediate nature. It employs a more refined syntax, specialized vocabulary, and logically structured and organized language. These intrinsic characteristics of oral and written registers have led to a greater emphasis on written skills over spoken ones.

3.4. Educators’ Pedagogical Competences

On the other hand, this study aims to diagnose and establish the connection between the use of AI and the development of Educators’ Pedagogical Competences (Redecker & Punie, 2017). These competences include proficiency in digital content (2), teaching and learning (3), assessment and feedback (4), and, lastly, empowerment of students (5). With 56 cases, the first contextualized category in language education pertains to educators’ ability to create, adapt, and employ digital resources that enhance language teaching and learning (Alejaldre & Álvarez, 2019; Juan-Lázaro & Alejaldre, 2020).

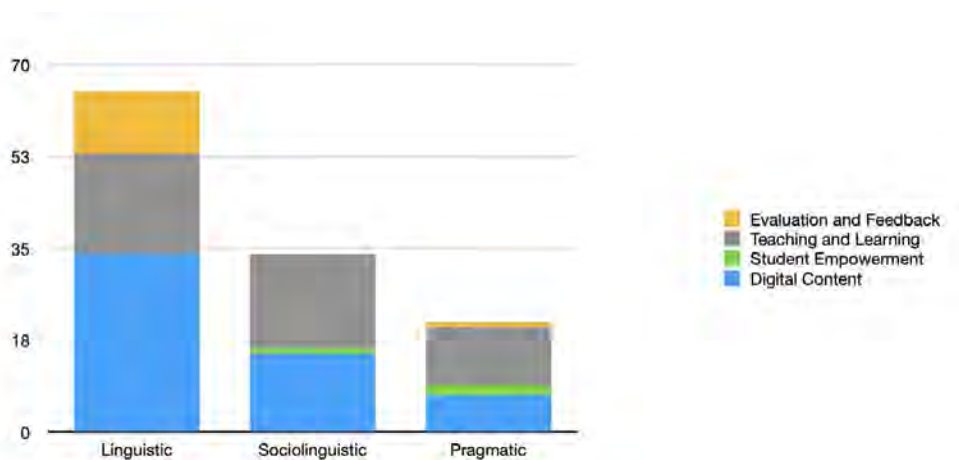


Figure 5. Educators Pedagogical Competences (DigCompEdu) and Student Competences (CEFRL)

The pedagogical competencies required of educators (Redecker & Punie, 2017) are proportionally distributed among the communicative competencies outlined by the Common European Framework (Consejo de Europa, 2002) in the context of digital content and of teaching and learning. However, this distribution is not mirrored in the domains of assessment, feedback, and student empowerment.

3.5. IA Tools and Key Language Competences

The item 'reading, understanding, and producing texts (images)' is the most numerous, accumulating 58 cases. It represents a significant set of skills related to reading, comprehending, and producing texts and images. These skills encompass the ability to analyze, interpret, and create written and visual content effectively, utilizing text generation tools (29), image tools (16), video (1), 3D objects (2), source code (8), and AI-generated text detection (2). The second category, 'voice to text (images)', totals 19 cases and underscores the importance of transcribing spoken content into a text-visual format, potentially associated with information accessibility through AI applied to text and image generation (3), video (6), 3D objects (2), and audio (8). The next skill pertains to personal interaction, involving the ability to initiate, maintain, and conclude conversations. In the 18 listed cases, oral or written communicative exchanges occur where both the sender and receiver—student-to-student, student-to-AI—practice dialogical skills through text generation (15), image tools (1), and AI-generated text detection (2).

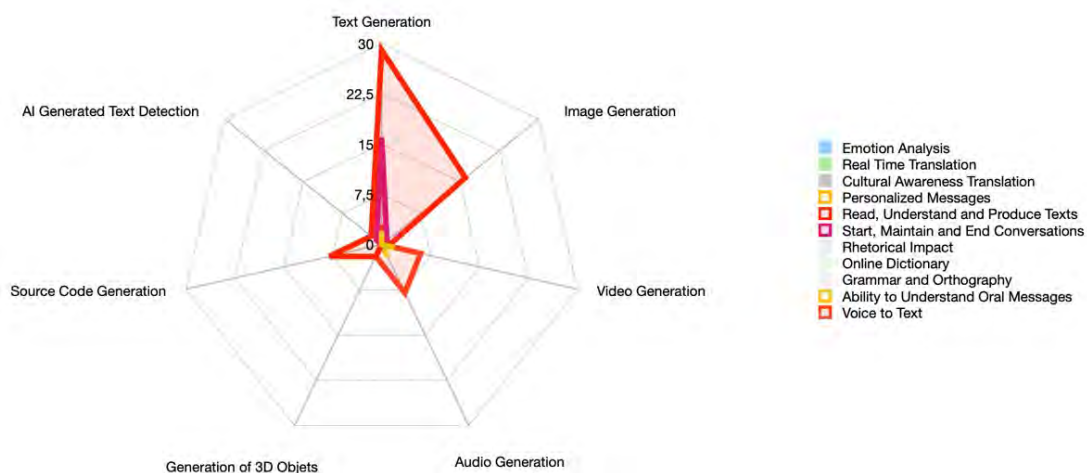


Figure 6. Pedagogical Competences of educators (DigCompEdu) and Student Competences (CEFRL)

4. Discussion and Conclusions

Subsequently, these tools are presented along with the number of cases or examples corresponding to each category, including text generation, images, video, 3D objects, audio, source code, and those designed for AI-generated text detection. In the realm related to text generation, specifically 62 cases, we have observed that tasks integrated into the teaching and learning process materialize as grammar exercises, oral practice dialogues, vocabulary lessons, and authentic texts in the target language. This empowers educators to personalize and sequence content, providing students with a wide array of learning resources, thus optimizing the teaching process. Focusing on the 18 cases involving image production and how to transfer their utility to language didactics, the response is a profusion and diversity of resource offerings. These resources encompass the creation of visual cards, illustrations of communicative situations – such as Dream by Wombo, Leap, or Midjourney – and graphic material for teaching words and phrases, all of which involve a creative process and constitute a new shared space for both educators and learners, including tools like Decktopus, GPT for Slides, or SlidesAI.

Audio content generation encompasses 14 diverse examples across various functions. The most significant options within this category facilitate the creation of pronunciation standards recordings,

practice dialogues, narrations, and listening exercises. Such tools educate and stimulate listening skills, thereby contributing to the production of the target language's oral proficiency. The next tier combines the advantages of imagery with the extensive possibilities of sound, focusing on audiovisual material (10 cases). Explanatory videos demonstrating authentic dialogues and communicative exchanges serve as a catalyst for acquiring sociocultural and pragmatic competences. Expanding the scope of AI, we encounter four applications capable of recreating 3D objects—AICommand, DreamFusion, GET3D, and Imagine 3D Que. In the context of our study, these applications primarily serve the simulation of language immersion situations that expose learners to realistic scenarios. The last two categories, source code generation and AI-generated text detection, encompass 8 and 4 cases, respectively. AI-driven source code generation involves intricate systems and processes capable of shaping learning platforms in any discipline. Advanced digital literacy would enable students to practice coding and learn the language in a contextual manner. Lastly, the tools designed to evaluate the originality of language learning-related written texts – such as Turnitin, AI Text Classifier, Copyleaks, and GPTZero – also serve other functions, including verifying the authenticity of online learning resources and preventing plagiarism.

Variables that allow the use of artificial intelligence related to the development of Educators' Pedagogical Competences (Redecker & Punie, 2017) have also been assessed. Educators are responsible for critically selecting and evaluating digital resources to determine their alignment with learning objectives and the needs of their students (Álvarez, Alejaldre & Mateos, 2021). This necessarily involves the creation of digital materials, such as interactive exercises, instructional videos, and online learning platforms, all aimed at promoting the acquisition of the various components that constitute communicative competence.

Area 3, responsible for teaching and learning, encompasses 48 cases. In the context of our study, this competency centers on educators' capacity to design and facilitate effective and motivating learning experiences in digital environments. Language instructors must proficiently integrate digital tools to develop communication skills in the target language, encourage autonomous practice, and create opportunities for authentic online interaction (Méndez & Pano, 2019), all while incorporating pedagogical strategies that promote active learning and the development of communicative competence (Marta-Lazo & Gabelas, 2016).

The focus on assessment and feedback includes 13 cases distributed between only two categories of AI tools: source code generators and those designed for AI-generated text detection. This particularity is not trivial, as even though the variables are not limited to the same catalog, both descriptors serve an identical purpose. This competency involves educators' ability to assess students' progress in their language skills and provide effective feedback in digital environments (Román-Mendoza, 2018). Additionally, the creation of authentic assessments measuring communicative competence and the use of technological tools for managing and analyzing assessment data have become a top priority in learning environments. Similarly, providing personalized feedback that contributes to cultural competence is an essential aspect.

The competency related to student empowerment (3 cases) focuses on educating and raising awareness of responsible and autonomous digital users (Sánchez & Mestre, 2016). In this regard, tools such as Lexalytics, Deepmind, and Stability incorporate digital skills such as media and digital literacy within the context of a foreign language, as well as online safety and critical thinking regarding language sources and content. Additionally, these tools promote active student engagement and encourage a sense of belonging and connection to a virtual community, fostering autonomy in their learning and the development of a responsible digital identity (Castells, 2015).

As for competences that, integrated into the communicative sphere, compartmentalize the skills inherent to the knowledge and practice of a language (Consejo de Europa, 2002), linguistic competence stands out with 65 cases. It focuses on the normative understanding of grammar, phonology, morphology, and syntax of a language. Secondly, with 34 cases, the category refers to sociolinguistic competences, such as an understanding of the social and contextual uses of language and linguistic variations as reflections and indicators of cultural and social aspects, as well as other factors like age and gender. Thirdly, with 21 cases,

pragmatic competence addresses the interpretation of meaning in communicative situations and the social implications of language, particularly those related to effective communication and intentional discourse responses.

The prevalence of linguistic competence, as outlined by the Common European Framework of Reference for Languages, deserves attention within the communicative competencies emphasized by AI tools. Pragmatic and sociolinguistic competencies take secondary roles compared to the development and exploitation of grammatical competence. The latter, as defined by the *Diccionario de Términos Clave de ELE* (Dictionary of Key Terms in Spanish as a Foreign Language), is “the ability of a person to produce grammatical statements in a language, that is, statements that respect the grammar rules of that language at all levels (vocabulary, word and sentence formation, pronunciation, and semantics)” (Martín-Peris, Atienza-Cerezo, Cortés-Moreno, González-Arguello, López-Ferrero & Torner-Castells, 2008).

In the context of learning environments with artificial intelligence (AI) tools, it is crucial to contemplate the role of linguistic competence as subordinate to communicative competence. While linguistic competence remains a fundamental component to ensure grammatical correctness in communication, AI tools refresh the paradigm by offering new opportunities to dynamically and effectively develop and enhance communicative competence. Within these environments, linguistic competence can be fortified through the utilization of natural language processing (NLP) algorithms, which provide instant feedback on grammatical and vocabulary aspects. Communicative competence and AI-enhanced learning environments form a mutually beneficial partnership in the development of listening comprehension skills, intention interpretation, adaptation to various contexts, and effective language use in real-life situations. The success of this symbiosis lies in the creative capacity of generative AI tools to offer interactive exercises simulating authentic conversations. In these exercises, students must consider not only the social and cultural norms but also attend to conversational pragmatics to facilitate effective communication.

Furthermore, AI tools broaden the scope of communicative competence by assessing students’ ability to comprehend emotional nuances, interpret context, and adapt their discourse to the audience. This provides educators with insights to customize instruction and offer specific, functional guidance to each student based on their individual needs. Ultimately, the implementation and utilization of AI tools in language didactics contexts equip learners with the ability to understand and use language effectively in a digitally connected and global communication-driven world (García-Peñalvo, 2023).

The supremacy of AIs focused on the development of micro skills in written proficiency far exceeds that of other applications. This data only highlights the traditional grammatical instruction that has long governed language teaching and learning processes. However, oral skills continue to be considered less important or given less value in learning, perhaps due to the spontaneity and immediacy of spoken discourse.

Finally, it is necessary to perform a quantitative cross-analysis of the variables that characterize this study with the aim of resolving the procedure and concluding the systematization of results. To achieve this, two types of data are described and linked: those pertaining to the functional characterization of the tool (Morales-Chan, 2023), and those providing a detailed perspective on the skills required in this specific context, with a focus on reading, understanding, and text production, as well as voice-to-text conversion and interpersonal communication skills (Tuomi, 2018). However, it is essential to emphasize that the design of this research requires expanding, adapting, and updating the traditional conception of a reader to that of a text-visual reader (Mora, 2012). This new identity underscores students’ inclination to blend ‘linguistic and digital competence to successfully address the challenges of the evolving narrative technology landscape’ (Mateos & Alejaldre, 2023).

Three skills account for 95 out of the 120 tools that enrich the target corpus of this research. Consequently, the remaining data represents a minority of results. In a less significant proportion, there

are AI tools centered on the analysis of emotions expressed through language (5 cases). However, dealing with emotional connections remains a major challenge for this technology, as it possesses the ability to recognize, identify, and mimic emotions but lacks the capacity for empathy. The skill of using persuasive and rhetorical strategies to influence communication effectively, defined as 'rhetorical impact,' is distributed among 5 cases, with 4 related to text generation and 1 to audio. Under the category of 'personalized messages' (4 cases), the importance of tailoring communication to meet individual recipient needs is emphasized, mediated through generative text AI (2) and video (2). The catalog includes only 4 cases for the descriptor 'understand oral messages,' with 2 related to text generation and 2 to audio. This denotes that the practice of active listening and auditory comprehension is not prominent in communicative interactions. There are three AI tools developed for text generation under the category of 'grammar and spelling,' while those focused on translation, either in real-time (2) or with cultural awareness (1), are reduced to one video application, one audio, and one image, similar to the dedicated online dictionaries with a single audio entry.

The prolixity of the applications generated under the development of AI demonstrates the wide panorama that opens for both students and teachers. This entails specific training that enables the healthy use of AIs, which should not be demonized. In the same way, the educational precepts must be modified in favor of a teaching more adapted to the times that contributes to an optimal use of the tools shown. It has been demonstrated that they allow the development of the basic skills and competences of teachers and students.

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