

**Exploring Artificial Intelligence in EFL Education in Colombia: A Documentary Analysis
of Research, Policy, and Pedagogical Practices**

Gabriela Meneses Beltrán

Thesis director:

Sergio Francisco Hernández Saavedra

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ABSTRACT

This study describes the current landscape of research production, policy development, and pedagogical practices regarding the integration of Artificial Intelligence on EFL teaching and learning in Colombia. Adopting a qualitative approach, documentary research design, twenty-two sources were analyzed-including undergraduate thesis, master's research, journal articles, and national policy documents from 2009 to 2025. The analysis and findings were organized around four categories: AI as a pedagogical tool, ethical and responsible use of AI, limitations and challenges in AI integration, and educational policy and institutional support.

Findings indicate that AI is recognized as a meaningful pedagogical source in Colombia EFL contexts. However, a persistent gap exists between growing policy intent and actual classroom practice. Ethical preparedness consistently falls behind technical adoption, and structural barriers continue to restrict equitable implementation. The study concludes that AI integration in Colombia EFL is developing but uneven. Progress in this domain demands not just technological adoption, but critical, contextualized, and policy-driving approaches that guarantee educational adoption are both equitable and meaningful.

Keywords: Artificial Intelligence, EFL teaching and learning, Colombia, educational policy, teacher training, ethical use of AI, pedagogical innovation.

CONTENT TABLE

CHAPTER I: Contextualization and Statement of the Problem	1
Statement of the Problem	5
Rationale:	9
Research Question:	12
Objectives:	13
CHAPTER II: Conceptual Context (Theoretical Framework)	13
Artificial Intelligence	14
Teaching of English as a Foreign Language (TEFL)	18
Educational Policies	21
Ethical Considerations in the Use of Artificial Intelligence in Education:	23
CHAPTER III: Methodological design	24
Data Collection Instruments	28
Rubrics:	28
Documents:	30
CHAPTER IV: State of the Art	32
CHAPTER V: Data Analysis and Findings	58
5.1 Artificial Intelligence as a Pedagogical Tool in EFL:	63
5.1.1 AI-driven adaptive learning:	63
5.1.2: Engagement and Motivation:	65
5.1.3. Language Skill Development:	67
5.1.4. Pedagogical Innovation and Educational Impact:	69
5.2. Ethical and Responsible Use of Artificial Intelligence in EFL:	71
5.2.1 Ethical Awareness Among Academic Population:	71
5.2.2. Regulation, Governance, and Data Protection in Artificial Intelligence Use:	73
5.2.3 Institutional Ethical Training Initiatives:	75
5.3 Limitations and Challenges in the Integration of AI in EFL:	76
5.3.1. Lack of Time and Limited Practice Opportunities:	77
5.3.2. Technological Limitations:	79
5.3.3. Risks to Critical Thinking and Academic Integrity:	81
5.3.4 Pedagogical and Institutional Gaps:	84
5.4. Artificial Intelligence Educational Policy and Institutional Support in EFL in Colombia:	86
5.4.1. National Artificial Intelligence Policies and Guidelines Development:	87
5.4.2. Infrastructure Development Initiatives:	89
5.4.3. Curriculum Integration of Artificial Intelligence and Reforms:	91
5.4.4. Institutional Adoption and Implementation:	93
CHAPTER VI:	96

Conclusions	96
Implications:	97
Limitations:	98
Further Research:	99
References:	101
Annexes:	109

CHAPTER I: Contextualization and Statement of the Problem

One moment everything was normal, then schools in Colombia blinked out of existence. The pandemic hit fast, leaving teachers fumbling through unfamiliar apps just to stay connected. Lessons popped up on screens instead of chalkboards and a shaky internet signal became a wall some could not cross. Voices came through crackling phone lines when video failed. Attendance thinned like mist under sun; some simply stopped answering. Out there, where roads split sharply between who gets what, Artificial Intelligence (AI) slipped into teaching English like a shadow trailing old crises. It showed up not polished or planned yet tangled in the mess of fixes meant to be temporary still dragging on.

Surprisingly, the pandemic pushed schools into using technology faster than ten years of policy ever did. Two weeks replaced a decade of slow progress. Sudden necessity drove change with no debates, no funds, no preparation. Tools arrived before teachers learned how to use them well. According to Phillips (n.d., cited in Universidad Sergio Arboleda, 2021), what was once a choice turned into a must for staying open. Still missing is any real proof that shifting online means better learning. That gap lingers. Improvement was not guaranteed by speed.

Likewise, schooling stood out as a visible sign of shifting patterns. When classrooms shut across nations, instruction shifted abruptly to digital spaces. Tools once treated as extras -remote learning systems, electronic evaluations- took center stage without warning. Teaching continued solely through screens, reshaping how knowledge moved. Computer science began linking widely with other subjects, spreading like threads through different areas. Such change hinted at deeper shifts forming in learning's structure (Phillips, n.d., as cited in Universidad Sergio Arboleda, 2021).

When the academia went through these hard times, artificial technology followed, with urgent results. A UNESCO report in 2020 found that crises had brought out the shortcomings of traditional systems and at the same time, showed how big of an asset technology is in times hard to manage such as these. In such a context, Artificial Intelligence has become a major participant. It is no longer something away from people's minds. It is here to help change the very nature of education. But classrooms were beginning to appear inoperable unless they evolved to incorporate digital resources and new approaches to expose students to information.

There was also a significant body of research at that time making a strong case that technology needs, or can be integrated into schools, and for finding new ways to share information and promote learning. Henríquez (2025) research identified, for instance, the promising benefits of technology's ability to change how people build meaning and comprehend new ideas. This shift towards technology was not just about technology itself, it was also about reinterpreting the way humans think about both, learning and teaching process. In this regard, using AI and digital resources appeared as a tool to help educators to develop better, more interesting, and more effective educational experiences for their students.

Later on, academic population showed that digital devices might help more people access lessons, stretching school beyond walls while quietly redefining classroom routines. After the pandemic, smarter software such as ChatGPT arrived, speeding up these changes without loud announcements. Life began shifting in subtle ways, revealing new thoughts about what teaching should do and where it could go. Sayings like "education will never be the same" carried weight far beyond talk of screens versus desks.

Likewise, learning started changing shape. A single step at a time, responses shaped to each person helped them adjust how they studied. Even when schedules and distance stopped being problems, another wall stayed up: words spoken differently across borders. Suddenly, meaning moved fast between tongues, letting thoughts cross into minds that once could not follow. This change started altering which people access which knowledge, unlocking doors formerly sealed by language only. Questions popped up less often because tech handled routine doubts, easing strain in class time. With this in mind, as software notices how learners act, processes adjust on their own and machines stand quietly nearby now, as part of daily guidance given by teachers (Tecnológico de Monterrey, 2023).

Having established this context, in the process of Teaching and Learning English as a Foreign Language (EFL), and inside classrooms touched by artificial intelligence, opportunities to talk, compose thoughts, receive responses stretched past borders. Machines driven by smart systems now hand back quick observations about vocabulary choices, pronunciation, and grammar patterns immediately. A setting emerged where bots step into chats like actual speakers, building lifelike turns into talk, made-up but useful moments together. (Hidalgo & Villán, 2024).

Nowadays, educators can shape lessons tailored to individual students, while interactive platforms respond directly to how each learner advances. Technology now does far more than supports old methods, it actively transforms how instruction is done across classrooms. Around the globe, English teaching slowly shifts under the influence of smart systems, marking quiet yet steady change. What we see today signals less a sudden break and more an evolving phase in educational practice.

Statement of the Problem

Though noted widely, the push for tech in schools during the pandemic began earlier in some Latin American nations. Not so in Colombia, where digital solutions exposed uneven access alongside promising uses. Comparisons with nearby countries offer insight, yet demand caution. While Chile, Brazil, and Argentina already worked on AI strategies pre-pandemic, Colombia did not finalize its initial National AI Policy (Comisión Económica para América Latina y el Caribe [CEPAL], 2024) until 2025, showing deeper systemic lags. Behind this timeline lies weak investment in educational tech research, as CEPAL reported last year. Moreover, is not just about unwillingness to do so, as key national factors must be taken into consideration as well: lack of internet access in remote and rural areas alongside minimal training for teachers around the country.

Although some policy changes have been made lately, AI implementation in schools is still a work in progress. In this sense, different challenges have to be also taken care of as unequal access to devices and internet as they represent a huge threat to the idea of implementing AI in classroom practices across the country. According to data from the National Administrative Department of Statistics (in Spanish Departamento Administrativo Nacional de Estadística or DANE, 2021), presented in the Statistical Report No. 1 on Education, Science, Technology, and Innovation, only around 85% of schools use technology for their teaching practices. Equally, in schools run by the state only two-thirds offer access to computers and devices to their students. These statistics highlight the inequality students suffer when trying to have modern technology to adapt to their learning process. Still, rural schools face the toughest challenges: missing equipment, consistent web access, or help fixing tech issues. Because of this gap, chances to

study new digital methods shrink, while unequal online conditions grow stronger, blocking student access to possible learning systems powered by AI.

In this line, despite early steps by Colombia to include AI in universities, efforts mostly favor tech-driven sectors instead of being also included in how other fields as foreign languages are taught and learned. Official records from the National Higher Education Information System (in Spanish Sistema Nacional de Información de la Educación Superior or SNIES), under the Government of Change initiative, show 865 live AI-related degree paths now available through 190 colleges across the nation. Core topics span computing, automated systems, information analysis, bioengineering, health-focused engineering, program design, management of digital assets, protection of networks, large-scale data handling, connected smart devices, tiny-machine technology, mechanical-electronic fusion, real-world math applications, robotic systems, plus several adjacent disciplines (Ministry of National Education, 2025). Although this growth shows a national commitment to advancing AI knowledge, most initiatives are focused on technological and engineering fields, leaving the educational sector, and particularly language learning and teaching, less explored in terms of this AI integration.

When addressing specifically the field of ELF in the country, current policies do not align with technological innovations as in other parts worldwide. For instance, The Basic Standards of Competence in Foreign Languages: English (Guide No. 22), by the MEN (2020), were designed to establish a framework in terms of what needs to be achieved when learning foreign languages. Despite its original purpose, these standards remain the same since their release, thus, they do not mention anything related to AI as part of the students' learning processes. As a consequence, most kids around the country do not have enough tools to understand how to use AI responsibly and the influence it has when learning a foreign language. Hence, as policies cannot keep up with

the world's current demands, teachers and students around the country continue focusing their teaching and learning process with unsuited methodologies and resources.

Similarly, a significant concern in Colombia relates to the minimal training of teachers regarding AI competences. Although intelligent technologies are becoming more prominent in educational settings, teachers' education courses rarely treat AI as essential content. A look at syllabi from language teaching degrees at several Bogotá institutions such as Universidad Pedagógica Nacional (2025), Universidad Distrital Francisco José de Caldas (2025), Universidad Antonio Nariño (2025), Universidad Libre (2025), and Pontificia Universidad Javeriana (2025) revealed nearly no emphasis on AI training for pre-service teachers. Actually, spread across roughly eight to ten terms, each program offers just a single class related to educational technology, if any, centering instead on basic digital tools rather than intelligent systems. Measured precisely, fewer than 2% of academic subjects across these degree courses cover technology-focused instruction with clear AI components, instead relying on traditional methods. Such low inclusion shows how teacher training still treats AI as peripheral rather than essential to modern teaching skills.

Progress so far reflects a wider pattern across the country. Although Colombian higher education institutions acknowledge that tech integration matters in language instruction, most stop at encouraging fundamental digital skills instead of building strong awareness around Artificial Intelligence. As a result, new English teachers graduate without adequate training to engage critically, responsibly, or innovatively with intelligent technologies in their teaching practice.

Most schools talk change while classroom routines stay frozen in place. Likewise, teachers must gain confidence working alongside AI, so learning can improve. Yet blind trust brings danger; someone should question whether these tools play fair inside school walls and take safety around personal data. Because those standards do not exist yet at all, protecting learners during AI use becomes a challenge. When this is not part of the big picture, decisions get made on the fly, often missing consistency. Taken together, these national conditions highlight the need to examine how research produced by pre-service teachers, policy developments of the country, and pedagogical practices related to AI in EFL are currently being approached in Colombia.

Rationale:

A recent report from the Latin American Artificial Intelligence Index reveals that Colombia has made significant progress in the adoption of artificial intelligence, scoring 52.64. This report, a collaboration between Chile's National Center for Artificial Intelligence and the Economic Commission for Latin America and the Caribbean (ECLAC), assessed the region's progress in this field. However, a particularly evident disparity was observed in English language teaching, where students in large cities have a clear advantage over their peers in rural areas.

While national indicators can offer an overview of a country's progress, they can sometimes overlook the unequal distribution of technological resources across different educational settings. By recognizing and addressing these diverse realities, Colombia could continue to make significant progress in artificial intelligence plans and policies, ensuring that everyone has access to the benefits this technology offers.

In the educational sphere, issues such as ethics, curricular changes, and classroom implications require a reformulation to guide educational processes now that new technologies are being introduced into classrooms. While intelligent tools can personalize activities for each student and address learning gaps, most institutions still lack the necessary resources to implement them, a reality highlighted by Defelipe Díaz (2025). Given that artificial intelligence could transform classroom operations, having robust supporting structures becomes crucial; without guidance, progress stagnates. Instead of implementing it without guidance, consistent support is needed to guide the integration of technology into teaching.

Therefore, the Colombian education system must embrace the challenge of integrating all students into the digital learning environment. In this context, especially when incorporating artificial intelligence into English as a Second Language (ESL) instruction, these decisions must be carefully considered. As Chicaiza et al. (2024) explain, AI-based tools can create personalized learning activities and assessments that can improve skills such as listening comprehension, conversational ability, text interpretation, and sentence construction. These strategies can have a positive impact on the quality of teaching.

Continuing with the overall picture of Colombia, it's important to highlight that there are days in the country when internet access is unavailable, making it difficult for teachers to seek support on online platforms. When this happens, completing daily tasks becomes a challenge. This indicates that as routines and realities change, there is also a certain resistance in the classroom, stemming from the real obstacles that teachers and students face daily.

Given this current situation, I believe it's necessary to delve deeper into how artificial intelligence is being used in language teaching in Colombia. Once teachers, students, and the academic community recognize what has been done, what is being done, and what can be improved, the country will also be able to better manage its technology. It's true that schools need time to prepare before introducing new devices in the classroom. But how we respond to general concerns surrounding new technologies will also guide our approach to using them.

Research Question:

What characterizes the current landscape of research production, policy development, and pedagogical practices regarding the integration of Artificial Intelligence in EFL teaching and learning in Colombia?

Objectives:

General Objective: To describe the current landscape of research production, policy development, and pedagogical practices regarding the integration of Artificial Intelligence in EFL teaching and learning in Colombia.

Specific objectives:

To examine the development of Colombia's national policies and strategic frameworks on Artificial Intelligence and their relevance and implications for EFL teaching and learning.

To identify the current challenges and gaps in the implementation of AI-based tools in EFL classrooms in Colombia.

To explore how the pedagogical, ethical, and technological dimensions of AI integration in EFL teaching and learning are addressed in academic studies produced by pre-service teachers, including thesis, monographs, literature reviews, and state-of-the-art reports.

CHAPTER II: Conceptual Context (Theoretical Framework)

Artificial Intelligence

Long before computers existed, thinkers pondered whether thinking could be mechanical. Around 400 B.C., some started viewing the mind not as mystical - but as something operating by rules. This shift opened doors to picture non-human minds following logic like people do. Russell and Norvig (2004) point out how these ancient views quietly shaped what we now call

AI. Over centuries, such reflections slowly turned into experiments linking thought and machinery.

Table 1: Definitions of Artificial Intelligence.

Author	Year	AI Definition
Haugeland	1985	“the new and exciting effort of making computers think—machines with minds, in the full and literal sense.”
Charniak & McDermott	1985	“the study of mental faculties through the use of computational models.”
Kurzweil	1990	“the art of creating machines capable of performing functions that, when done by people, require intelligence.”
Nilsson	1998	“intelligent behavior in artifacts.”

Note. Adapted from Russell and Norvig (2004).

Looking at Table 1, AI definitions have changed across decades. When taken as a group, these descriptions show shifts in thinking as more a layered than straightforward progress. At first, ideas centered on mimicking thought: Haugeland (1985) spoke of "machines with minds" later, Kurzweil (1990) measured success by how well machines performed tasks. Recently, bodies such as the European Commission describe AI through actions as pursuing goals without constant oversight (2019) highlighting utility instead of similarity.

In EFL teaching, this change carries weight; usefulness comes not from whether a system reasons like an educator, but from its ability to detect and address individual student weaknesses more precisely. Though built to mirror some thinking patterns, AI serves more as a support than a substitute. It helps people tackle complex choices where logic and judgment matter most. Instead of overtaking minds, it extends them quietly. With tools that learn and adapt, users gain clarity in moments requiring insight.

Additionally, following these perspectives, AI can be understood as “*the study and construction of rational agents, systems capable of perceiving their environment and acting in ways that maximize their chances of achieving their goals*” (Russell & Norvig, 2004, p. 33). In this sense, intelligence is linked to rational behavior, and AI emerges as the scientific field that looks for the creation of systems capable of acting intelligently within different environments.

According to the European Commission (2019), AI is a technology that acts intelligently while studying its context in order to give answers to specific goals. As it adjusts independently while pursuing outcomes, such behavior highlights independence and purpose as core aspects of what makes something seem smart. Rather than just following fixed rules, these systems react in ways shaped by feedback, shifting course without constant oversight. Seen this way - and building on earlier broad views - it becomes clear that AI is ultimately built by people to boost how we think, solve problems, or handle complex tasks. Though powered by code and data, its roots lie in extending what minds can do when supported by responsive machines.

Likewise, when machines learn to make sense of data on their own, they begin to act in ways shaped by circumstance. Because of this shift, technology starts reflecting how people think. Thus, these tools go beyond routine reactions. Instead, intelligence built into systems helps sharpen human judgment and with such support, tackling difficult problems becomes more accurate. In this sense, efficiency grows, flexibility improves and people adjust faster to different contexts when guided by responsive tech.

In the same way, the European Parliament (2021) defines AI as “the ability of a machine to display the same capabilities as humans, such as reasoning, learning, creativity, and planning” (p. 2). Seen this way, it becomes important to state that AI technologies should not be seen as

replacements for humans, instead, they are aimed at helping with activities that are difficult to carry out in a shorter period of time. Likewise, AI goals lay in offering better solutions and support in order to improve performance and abilities in contexts such as jobs, education, etc.

From an academic point of view, Artificial Intelligence is a term that Stanford University professor John McCarthy created in 1955 to describe “the science and engineering of creating intelligent machines” (Universidad Autónoma de Chile, 2025, p. 3). More recently, Baker & Smith (2019) also developed a perspective on the term from an historical and current point of view, in which they established a definition on AI to “those computers that perform cognitive tasks usually associated with the human mind, i.e. learning, problem-solving, etc.” (Universidad Autónoma de Chile, 2025, p. 7).

As noted above, from the different points of view analyzed, it is found that Artificial Intelligence is a human-centered discipline that deals with the goal of increasing human intelligence and the set of powers that distinguish humans from computers. These latter can perform many tasks but require humans to be a highly dynamic system in a state of constant change. In this sense, the AI systems are designed by engineers and researchers by incorporating human intelligence with the purpose of increasing and improving human intellect, supporting humans to handle new challenges associated with cognitive complexity. From this perspective, this technology has the unique benefit of helping people improve their intellectual capabilities to perform learning, problem-solving, analytical tasks, etc., using intelligent systems to support human cognition.

From a different point of view—particularly from the perspective of EFL—AI can be defined as the intersection of technology and pedagogy in the form of intelligent systems

designed to support adaptive personalized learning and feedback within educational environments. Within this context, AI can be thought of as an educational resource designed by humans to augment learning, using systems that track and respond to learners' performance data. Similarly, AI supports the development of critical thinking, a range of mental processes, and heightened language and metacognitive skills, including problem-solving, text comprehension, and self-assessment. Therefore, AI can work as a pedagogical tool that facilitates learning and teaching processes while also fosters cognitive competences in order to get similar outcomes.

Step by step, examining the previous conceptual contributions reveals a gradual shift in what is considered most important. From one perspective, the big question was whether computers could think like humans do. More recently, attention has turned toward how well tools work when given specific jobs to complete. The study here lines up with that newer way of thinking. In the educational field, particularly within EFL teaching, AI stands out as an element for pedagogical innovation, offering teachers with a set of tools that may enrich both their own teaching practice and learning experiences. For this reason, throughout this documentary research, AI is going to be understood as an interdisciplinary field that seeks to develop systems capable of understanding environments, processing information, and acting in consonance to achieve specific goals in EFL classrooms. All of this, while simultaneously serving as a transformative resource to widen human reasoning, communication, and problem-solving skills.

Teaching of English as a Foreign Language (TEFL)

The term English as a Foreign Language (EFL) refers to the study and teaching of English in contexts where the language is not the dominant way of communication. According to Nordquist (2020), this form of learning happens among those who speak another native tongue

and live in regions where English does not serve as the most important way for communication. Such an idea fits within Braj Kachru's Expanding Circle theory (as cited in Nordquist, 2020), which categorizes English as a native language in the inner circle (ENL), a second language in the outer circle (ESL), and a foreign language in the expanding circle (EFL). In these last areas, contact with English tends to happen inside school walls, not during daily life. Rather than being the tool for teaching math or science, it appears instead as a different course, limited mostly to textbooks and lesson time. At this moment, it becomes important to clarify the meaning of EFL before addressing the concept of Teaching English as a Foreign Language (TEFL), as this conceptual foundation allows to understand diverse authors' perspectives which will be presented to have a greater coherence.

Starting with Villacañas de Castro (2013), the term Teaching English as a Foreign Language (TEFL) describes instruction given to people learning English without regular exposure to it in daily life, an absence which brings particular teaching difficulties. As contact between teachers and students tends to be sparse, and because the language feels distant culturally, methods need extra precision. As TEFL is not apart from general education theory, it ought to follow common teaching frameworks, even though added layers of difficulty call for tighter lesson design. From this angle, effective practice includes helping learners question how English functions within worldwide economic structures. One outcome might be deeper personal engagement with the language through reflection.

In the same line, the teaching of a foreign language cannot be detached from the context in which it is used. With this in mind, learners must understand that English is not merely information or content but a tool that may benefit them in several spheres in their lives: familiar, academic, professional, among others. Moreover, The Suggested Curriculum Guidelines for

English as a Foreign Language stress the intercultural dimension of EFL learning (MEN, 2016). They describe how internal factors, such as learners' knowledge of their native language and culture, and external factors, such as exposure to other languages and cultures, affect the cognitive and affective dimensions of the communicative competence (Ministry of National Education of Colombia, n.d.-b). Getting closer to a new language sooner rather than later widens cultural understanding while sharpening how people engage with others.

In other words, TEFL covers the study and teaching of English in non-English-speaking societies such as Colombia, where it usually functions as an academic subject aimed at developing communicative and intercultural competence within a formal educational framework. Recognizing English as a foreign language within the Colombian educational system implies acknowledging the limited natural exposure learners have to the language and, consequently, what happens during lessons, the rules guiding teaching plans, and how teachers are trained suddenly matter much more than usual. Therefore, having this understanding of what TEFL means from a contextualized and intercultural point of view, is essential to explore how the integration of AI may contribute to the development of teaching and learning practices, and most importantly, how EFL can be configured across the country.

Educational Policies

From Colombia's legal standpoint, Act 115 of 1994 shapes how educational policy is understood. While no clear-cut definition appears within the law, it sets up core legal bases for education as a public duty. Its structure details objectives, guiding ideas, and areas of authority, pieces that together support policymaking across the system. These components serve to validate and direct how such policies take form nationally.

Education, according to Article 1, aims at ongoing personal, cultural, and social development grounded in a full understanding of human beings: their worth, responsibilities, and entitlements (Ley 115 de 1994, art. 1). Because of this view, learning becomes a basic entitlement; hence, rules guiding schools should ensure it reaches everyone. Following this idea, education should be understood as a fundamental right; therefore, educational policies must guarantee its effective achievement.

Similarly, Article 2 frames education service through legal rules, curriculum plans, and organized teaching stages meant to fulfill education's aims (Ley 115 de 1994, art. 2). Because of this, the school system rests on guidelines shaping how learning unfolds across levels. As society shifts over time, policy tools take form - not just reacting but adapting - to meet evolving public demands while upholding access to schooling. In this sense, structure enables response and this latter shapes equity.

This interpretation of the concept is consistent with wider institutional interpretations that enlarge on the nature of educational policy. In line with UNESCO's conceptualization, integrated into Colombian policy design guidelines, educational policy consists of the tools and instruments through which authorities generate changes in school systems, with the goals of improving students' learning opportunities and guaranteeing the Right to Education (as cited in Ley 115 de 1994). In this interpretation it is worth noting that educational policy is seen in a new light because it includes not only a regulatory role but, fundamentally, a transformative one that fortifies the school systems and creates socially relevant learning opportunities.

Educational policy should therefore be conceived as an intervention in the lives of learners and young people, ensuring that schooling is matched by meaningful, equitable and

socially relevant learning opportunities. Critical interpretation of these policy frameworks also needs to be taken into account. Tedesco (2009) highlights that educational policy refers to public decisions supported by particular frameworks of analysis which determine the distribution of opportunities for education, the social purposes of schooling and the ways in which equity is addressed within educational systems. In the same line, this author also analyses the educational policies within the frame of general social reorganization. While there has been an increase in access and organizational modalities, it is the development of learning outcomes that is lacking.

Nowadays, policy makers must be concerned with the potential of education to deal with the concentration of knowledge and fast changing technology. Hence, education policies cannot simply be a matter of indifference, they have serious implications for social inclusion and exclusion. Building on this, Tedesco (2009) establishes a perspective on education policy that should look at three fundamental dimensions: personal development, social coexistence and the imperative to innovate. Throughout his work, Tedesco seeks to highlight the development potential of education by linking these three dimensions. For him, educational policy should not be taken just as a regulatory tool, but as a developmental strategy focused on the individual's ability to live and socialize with others, linking personal formation, social coexistence, and innovation.

Ethical Considerations in the Use of Artificial Intelligence in Education:

As artificial intelligence in education is more explored, more questions are raised about basic ethical principles of authorship, accountability, and academic honesty. As AI is used to create work products, it becomes more and more difficult to distinguish between work generated by a person and work generated by a machine. This creates a situation in which educational

leaders and managers have a particular interest in creating transparent work processes. Teng and Huang (2025) point out that acknowledging AI usage in academic works is essential and ethical for maintaining trust and clear boundaries among original human works and supported works with AI contributions. However, the authors also state that other ethical considerations include work dependency, critique of AI-generated results, and data privacy.

Furthermore, a lack of emphasis on ethics in education with respect to the deployment of AI has been observed (Teng & Huang, 2025). This not only imparts uncertainty regarding ethical practices to those new to the field but also places the responsibility on individual educators to develop these skills themselves. Therefore, it becomes necessary to advocate for the inclusion of structured ethical training that moves beyond declarative knowledge and encourages both students and teachers to engage in reflective and practical ethical decision-making. In this line, the application of frameworks such as the Ethical Framework for Artificial Intelligence (Guío Español et al., 2021) highlights the need to adopt principles regarding issues like transparency, accountability, fairness, and ethical considerations. In order to ensure the good use of AI for learning, educational institutions have a special role in raising awareness and promoting the use of these technologies for the benefit of all learners.

In this case, when using AI a concern is always present in terms of what is right or not, especially when not all the people involved have the same chances to use these tools and the knowledge about how or why to use them differs. Similarly, fairness shows up in small choices, like which voices get heard by software. Biases hide in code even when intentions seem neutral. Instead of widening gaps, technology could balance uneven ground, if guided carefully. Outcomes depend less on machines, more on the values built into their design. Looking at things this way fits well with what Guío Español, Tamayo Uribe, and Gómez Ayerbe suggested back in

2021. Their ideas highlight careful use of Artificial Intelligence, opening doors for all people, involving schools and learners alike when shaping ethical rules. Because of that effort, learning might improve more fairly across different groups. Only then does technology truly support growth in classrooms.

CHAPTER III: Methodological design

At this point, clearing up the method behind this work matters just as much as the findings themselves, since it shapes how insights emerge during review. Instead of chasing broad patterns, what counts here is grasping how each person sees their surroundings, a core idea in qualitative inquiry according to Denzin and Lincoln (2018). Because of that, context becomes key and the meaning comes from lived moments, thus attention goes deep into personal views rather than aiming for wide rules. Understanding grows by listening closely to how others explain their own worlds (Denzin & Lincoln, 2018).

Looking sideways at the chosen method, documentary research means learning through others' past findings captured in writing. Not starting fresh yet building on records made before by digging into papers, watching films, reading websites, flipping pages. What shows up comes from print, screen, or sound, pulled together with care. Understanding grows not from labs or surveys, but from piecing together what was already said. Over months or decades, patterns emerge, particularly inside classrooms and teaching spaces and one source links to another, then another, forming paths through old ideas. Insight arrives quietly, shaped by texts someone else once wrote. Clarity forms slowly, through comparison and pause. Understanding deepens when voices overlap and decisions gain strength from that depth. In this sense, what people discovered before shapes better thinking now, pushing forward what counts.

In line with the idea established before, Bernal Torres (2006), defines documentary research as the “*analysis of written information about a specific topic, with the purpose of establishing relationships, differences, stages, positions or the current state of knowledge regarding the subject under study*” (p. 110). In this sense, this type of research relies on material as a reference point without altering its nature or meaning. With this in mind, documentary research aims to establish the current state of knowledge around a particular issue and, from that starting point, provide an answer to the leading question. Hence, its purpose goes beyond producing a booklet of information; instead, it aims to analyze the collected material to present a systematic response supported by existing sources. Thus, this kind of study means moving step by step through available texts to collect and review them closely.

Data Collection Instruments

Rubrics:

People often use rubric in schools since these guides create clear ways to measure work. What makes them useful is how they lay out expectations ahead of time, using specific markers for each level of achievement. Instead of just ticking boxes, they show what good looks like across multiple areas. Writers in education see them as maps for judging deeper assignments fairly. Clarity comes when everyone sees not only the scores, but why those scores fit. Judgments feel less random once the reasoning behind grades becomes visible. This shared understanding grows stronger when criteria are spelled out step by step. Research shows this openness helps students trust evaluations more (Jonsson & Svingby, 2007).

Having understood this, scholars often distinguish between holistic and analytic rubrics. The former involves making an overall judgment about the quality of a performance, allowing

evaluators to consider the work as a whole. The latter, in contrast, analyze performance into separate components, assigning individual scores to each part. In this regard, for this study holistic rubrics (see annexes 1 and 2) were adopted as the goal was to evaluate documents—such as legal texts and research projects—in terms of their overall relevance to the research objectives.

Documents:

In educational research, documents make a valuable source of data as they include a wide range of materials such as academic articles, institutional reports, policy documents, and student productions. Merriam and Tisdell (2016) emphasize that documents provide contextual information that supports a better understanding of the research setting. This characteristic is relevant for state-of-the-art studies, where the analysis of existing literature allows for the identification of trends, gaps, and emerging perspectives within a specific field. In this sense, document analysis facilitates the organization and synthesis of knowledge, enabling the researcher to construct a systematic overview that contributes to the achievement of the research objectives.

Similarly, the use of documents as a data collection instrument presents several advantages, including accessibility, stability, and the possibility of conducting longitudinal and retrospective analyses (Bowen, 2009). In this sense, documents can be reviewed several times, allowing for rigorous and systematic analysis over time. However, this method also entails certain limitations, such as document authenticity, access, and potential bias of the available sources. Therefore, a careful selection process accompanied by a critical evaluation of documents to ensure the credibility and relevance of the data must be done. Nevertheless, document analysis is a fundamental instrument in qualitative research, particularly in studies

aimed at examining and synthesizing existing knowledge, as is the case of the present state-of-the-art.

CHAPTER IV: State-of-the-Art

This chapter presents a descriptive overview of the academic and normative documents selected. It includes thesis, monographs, and Colombian legal and policy frameworks that address AI, digital transformation, and education from other perspectives. (See annexes 3 and 4).

To begin with, Moreno Nago (2025) presented an undergraduate thesis developed at the Universidad Nacional Abierta y a Distancia (UNAD) that aimed to strengthen the learning of English as a Foreign Language (EFL) among students enrolled in the English III course during the first academic period of 2025. The research focused on understanding how AI could adapt to students' individual needs in order to promote autonomous, motivating, and effective language learning. From a methodological perspective, the study adopted a qualitative and experimental approach, using qualitative observation and field diaries to document students' progress in vocabulary acquisition and speaking skills.

This study acknowledged learning a new language is not always easy as time runs short and daily exposure fades away. In fact, not everyone found tech within reach either. Still, certain tools made a difference somehow. Students who turned to these apps spoke up more during lessons. Speaking began to feel easier for them, since constant practice sharpened their sounds and clear reactions showed where changes helped. What stood out was the method itself - watching words work in actual moments gave lessons a grounded weight few expected.

From that starting point, Vargas (2025) carried out a research at Instituto Pedagógico Nacional to explore whether AI aided seventh graders' English pronunciation. Instead of just

guessing, the work tested actual classroom outcomes when speech tools powered by artificial intelligence were introduced. Because many public-school learners lacked rich language support, such tech might close gaps. This idea guided the inquiry. While some worry about machines replacing teachers, here the focus stayed on student reactions alongside progress. With digital tools now common in lessons, it made sense to check their real impact. Though results varied, one thing was clear: feedback from software changed how kids practiced sounds. Since access remains uneven across schools, even small gains matter. Rather than assuming success, the project measured both performance shifts and personal views. When tools responded instantly, engagement often rose - but not always. In settings short on materials, having an extra resource like AI could shift daily routines.

The study followed a mixed-methods approach that combined qualitative and quantitative data collection techniques to document changes in students' pronunciation performance and classroom dynamics. Vargas (2025) looked at how students improved in speaking and interacting during class by using both numbers and personal insights. Instead of just one way, they gathered information through surveys plus interviews. Tools like ELSA Speak gave learners instant responses on their spoken words thanks to voice detection software. Because of this feedback loop, many found it easier to fix mistakes on their own. Speaking up felt less risky over time, so more joined discussions without waiting to be asked. Yet some struggled when devices or internet were unreliable at home. Without steady tech access, practicing alone became harder for certain individuals. As a result, not everyone used the apps regularly beyond school hours. These gaps made rolling out the digital tasks uneven across groups.

Observing how teachers use AI and learn about tools such as ChatGPT-4 or DALL-E 3, within the selected documents there is a report on the trend of using AI for teaching and learning.

Gonzalez (2024) set boundaries: Create clear guidelines and expectations as soon as possible. This is especially important in what could be seen as a grey area of using technology, where it was easy for students to get lost in what they could do with AI. Conversation, observation, and analysis of student work: Although learning with technology was vastly different than without it, there were still rules to follow, such as ensuring the fair use of data. There were also considerations of safety and usefulness. Gonzalez offers insight into understanding technology in the classroom through observing and examining how technology is used in instructional practices.

People's actions could reveal specific patterns about the ways in which learning occurs with technology. Observed behaviors could also highlight areas for professional development to continue providing the best educational experiences for students. There was value in the clarity of approach used to work with students and the products created. Furthermore, there was an underlying ethic that drove the work that educators did, and what was visible in students' creations.

Out front, fresh moves in classroom teaching have been unfolding at Pontificia Universidad Javeriana. Led by Gutiérrez (2024), research peered closely at how artificial intelligence shaped writing skills during language study. While old routines held steady before, learning now bends slightly toward each person's pace - technology quietly backing self-driven work and unique routes through material, a change some educators are beginning to notice. Mixing hard stats with real-life reflections brought wider glimpses into habits students form using apps like Duolingo, ChatGPT, Grammarly, or Jenni.ai. Attention was settled not just on links between points but also phrasing twists, ways sentences build up, spacing within blocks of thought, even how meaning spreads across longer stretches of writing.

One thing stood out: learners leaned into the tasks, shaping their writing through revision with noticeable ownership. Yet relying on machines meant fewer real conversations between people, something that matters. The research points out one thing clearly: machines might reshape how people pick up English, particularly while crafting sentences. Yet caution matters as tools should lift learners higher instead of doing tasks they ought to practice themselves. A mix of digital aids and real conversations could shape lessons that stick better. Balance becomes the quiet force behind meaningful progress.

Looking into teacher trainees' views on Colombia's standardized English curriculum, Pardo (2025) explored what lied behind policy reception. Shaped by past decisions, the backdrop includes national frameworks like the 1999 foreign language guidelines known in Spanish as Lineamientos Curriculares en Idiomas Extranjeros. Then came the 2006 basic competency standards, officially titled Estándares Básicos de Competencias en Lenguas Extranjeras: Inglés or Guía 22. Later followed the 2016 DBAs for English. Each step aimed at bringing classrooms in line with shared goals - consistency, equity, broader access. Beyond structure, they tied efforts to the Common European Framework of Reference for Languages. Instead of measuring compliance, this work focused on perception - how those entering teaching interpret such directives. Meaning-making mattered here, especially when facing top-down shifts. Looking at how future teachers see these rules helps clarify ways to back their real-world use. What shows up in the results reveals what gets tough - also where things open up - during rollout of one-size-fits-all plans in language classrooms. The whole point? Untangle the messy reality behind policy and how it actually shifts daily teaching. When new educators speak up, paths appear - ones leading to fairer, sharper systems tuned to every student's reality.

Looking closely, the work took a qualitative path, using both deep single-case exploration alongside insights into personal experience. From second year to final term, future English instructors in the university program joined in - based at Universidad Distrital in Bogotá. What came out showed how these learners saw the DBAs, what they knew about official curriculum rules, along with where and how those ideas appeared in real lessons. A mismatch stood out: policy plans often felt distant from actual classrooms, with uneven grasp of the standards and little daily use during instruction. Instead, many pointed toward richer, conversation-driven methods tied to real situations, seeing educators less as rule followers but as partners shaping curriculum based on student life.

Adults often find picking up a new language hard. Yet imagine a future teacher wondering whether there might be a simpler path. Moreno Sánchez (2025) explored that idea closely focusing on AI's role in helping grown-ups speak English better. Instead of waiting, users get responses the moment they try. Practice happens more because tools adjust to each person's pace. Personal paths form through smart systems noticing what works. Feedback arrives instantly, shaping progress without delay. He checks many studies, some old books, others recent articles - each one tied to how adults pick up languages. A pattern shows up. Machines help people learn better than expected. These tools shift shape depending on need: sometimes an app, other times a talking program. Take Duolingo or Babbel - they adjust lessons based on what you do right or wrong. Then there are bots such as ChatGPT, which reply back when spoken to, letting users try out real talk. Learning changes slowly when machines respond like humans.

Looking at real classroom uses, Moreno Sánchez (2025) shared a student research project exploring how artificial intelligence methods might help adults speak English better. Instead of just theory, the work built practical approaches using earlier findings such as pulling together

past papers, academic books, and experiments focused on people aged 18 to 60. The study revealed students grow stronger in conversation by blending smart tools with practice routines. Nevertheless, some issues also arose: Trouble began when tech gaps blocked entry; not everyone owned gadgets capable of handling voice-based programs. Some lacked steady web links at home, which slowed things down. Still, the researcher felt hopeful when seeing how AI could support adult English learners. Given proper guidance and smart approaches, progress in spoken fluency seems possible, even likely.

Technology boosts learning when it plays a supporting role. Fonseca Gutiérrez's research (2021) showed something clear. Instead of just teaching words, they built a chatbot aimed at helping learners understand themselves better. This tool was used through WhatsApp, a familiar app for most people lately. Because speaking another language ties deeply to feelings, the design leaned into emotional growth like recognizing inner states or managing reactions. Students did not just practice grammar; they worked on awareness while chatting. Language progress turned out to be less about memorizing rules, more about handling one's own mind.

Ten people from the Colombo Americano composed the population showing step by step how a talking program came together for writing practice. Over days the group returned to old messages, spotting changes in what they wrote before now here today. Most students felt better about thinking for themselves after using the chatbot, inside school and outside too. Yet difficulties remained: keeping motivation up came hard, managing feelings was tricky, getting past inner blocks took effort. Watching learners over time seemed necessary if real growth in English was going to show clearly. Similarly, longer observation plus extra ways to check progress might give clearer answers later on. Tech like chatbots could support learning well,

when used thoughtfully as each student got responses tuned just for them, deeper reflection began to happen naturally.

Recently, work by Argüello, Galindo, and González (2025) gives evidence of how artificial intelligence influences training for new teachers. Looking closely at real experiences shaped this study's method. To grasp AI's role in classrooms, the team focused on personal insights rather than numbers. Through teacher interviews and classroom observations, patterns began to emerge slowly. In terms of its findings the following aspects were considered important: as machines now assist lessons, both educators and learners adjust daily routines without thinking much about it. When feedback fits each student perfectly, progress often follows quietly. Nevertheless, over time, small changes add up beneath the surface. Yet without proper guidance, even smart tools fall short. In this sense, teachers require clear ways to bring AI into lessons; training makes that possible. The research points one direction: machines assist language learning when handled thoughtfully. Success depends less on software and more on teacher readiness. Simply put, preparation shapes results.

Likewise, trainee teachers view artificial intelligence as something useful when studying and completing tasks. Yet there remains a mix of outcomes tied to its everyday use. While saving time stands out, so does summarizing texts effectively. Careless usage might lead to depending on machines more than needed. Thoughtful integration within courses seems necessary according to findings. Used wisely, technology supports language education well enough. Still, balance matters most behind closed classroom doors. Teachers must notice how AI might help or hinder classroom progress, then apply it where it boosts student growth. That approach lets learners tap into AI's strengths while improving their language skills step by step.

Adults and working professionals often face unique challenges when picking up English. Lately, scholars such as Moreno, Parra, and Rodríguez (2025) turned their attention there. In this research, their goal was to design an approach tailored to learners aged 30 to 50. Instead of traditional drills, they leaned on methods tied to how brains absorb information faster. Tech tools had an important role through apps and online platforms. Looking into AI tools found in apps like Duolingo, HelloTalk, and Tandem showed different ways they assist language learners. Because these systems adapt quickly, feedback fits each person closely. Even during rough patches motivation sticks around, mainly because pacing stays under user control. Learning unfolds without pressure, mainly due to tailored support built in.

Not everything came from charts alone, some pieces showed up through conversations as well. What stood out was how methods such as spreading practice over time, adding game-like elements, yet engaging multiple senses made a difference. Learners showed higher drive along with better language ability. Following the shift to these techniques, energy levels in class visibly rose. It turns out mixing smart teaching ideas with tech tools plus AI-backed materials packs a strong punch for grown-ups studying English. Together, these paths create steadier progress while keeping interest alive across weeks of learning.

Sánchez Perdomo (2025) explored testing AI along with web-based resources. Instead of textbooks, learners worked through lessons built around the Common European Framework. Tools like ChatGPT joined forces with the British Council site to shape those lessons Practice included pretend chats where replies popped up fast. Learners moved at their own pace because support was always there. In this regard, one thing was clear: students grasped English better when working with these tools. Not only did speaking improve, but writing grew stronger too. Confidence started showing up in how they used the language every day. Likewise,

independence appeared into their learning without much prompting from teachers. Finally, the findings showed teaching English through artificial intelligence tools plus online systems may strongly support student progress.

Starting fresh with English lessons in classrooms is not always smooth. Trying another path, Jiménez, Mejía, and Quintero (2024) tested a shift. A system named Carnegie Learning was built, this online space runs on artificial intelligence, letting learners move step by step through English practice. To check if this actually helped, information came together from both students and educators. Surprisingly, the students enjoyed working through the platform, which made grasping English easier. It stuck with them longer and lessons held their attention more than before. In terms of the findings, it was evident that teachers must learn how to work the system well. In the same line, evidence suggested AI might reshape learning, yet success hinges on proper guidance behind the scenes. When support exists, student experiences grow sharper, tailored, stronger.

Looking into AI's role in learning English, Valdés Mendoza (2025) explored its effects on both teachers and learners. Instead of just focusing on tech, the work highlighted ways artificial intelligence supports skill growth through shared experiences. While examining real classroom uses, it became clear that motivation often rises when students engage together using smart tools. Though centered on language, the insights came from reviewing existing writings rather than running new tests.

In terms of results, it was shown that when teachers use adapted material through AI, followed by immediate feedback, learners' skills seem to have a progressive improvement. In this sense, it was stated that good results inside the classroom can be achieved when is enough

support for the learners inside their learning environments. Nevertheless, there is still the issue of trying to level the knowledge each student has in the classroom in terms of the correct use of AI technologies, as not all of them have the same training or developed skills.

ChatGPT shows up in classrooms more these days, stirring conversation. A 2024 paper titled *"Incorporating ChatGPT: Ethical, Editing and Training Aspects for Graduate Students"* explored its role in advanced studies. Researchers noticed that learners lean into ChatGPT differently, some to fix errors fast, saving minutes here and there; others stick to pen-and-paper habits, avoiding the tool due to doubts about quality or fairness. In this line, trouble shows up when learners are not sure how to interact responsibly with such systems. Without clear guidance, the process for learners can be very tortuous.

In the same line, learning to handle ChatGPT wisely matters now more than ever. With classrooms shifting, knowing how to apply AI without crossing lines becomes key. Not because rules demand it, but because trust in scholarship depends on clarity. Picture a graduate student using AI not to cut corners, but to build stronger arguments. That outcome comes from guidance, not guesswork. Yet one thing holds steady: thoughtful use beats blind adoption. Graduates well equipped tend to lean into responsibility without being told.

In time, smart habits around AI may simply feel normal. Nevertheless, higher education shapes those beginnings whether ready or not. One thing stands out: the research highlights why ethics and rules matter when using AI tools such as ChatGPT in school-related tasks. Instead of rushing in, people should reflect on questions around who gets credit, what counts as honest work, along with weighing possible downsides against advantages. Because these technologies shape how knowledge is built, handling them with care helps protect core academic ideals. Even

though ChatGPT might offer real help during students' studies, its power depends heavily on user judgment. When guidance exists, clear expectations form, thus, making sure usage stays open, fair, and actually helpful.

Recently, Pérez-Montero and Hernández-Henríquez (2025) studied how college learners drafted research plans using ChatGPT. Not focused on replacing teaching methods, they explored if AI could blend into lessons while keeping original aims intact especially where English was not the main focus. Rather than treating technology as a solution by default, they examined its actual value under teacher supervision.

Surprisingly, the learners worked more effectively when teacher directions came alongside ChatGPT. Without clear direction, though, leaning heavily on artificial intelligence sometimes dulled independent thinking. Likewise, when oversight existed, writing showed clearer progress through structured feedback loops. In the same line, instead of replacing effort, some students found ways to build deeper understanding using tools like ChatGPT. Similarly, the data showed that growth can appear when machines challenge assumptions instead of handing answers.

On another view, not long ago, Colombia ran on CONPES 3975 (2019), a plan guiding digital transformation and artificial intelligence throughout every corner of life. While updating systems, it tried to pull together public services and private efforts to grow common advantages through smarter ways of doing tasks. Due to artificial intelligence did not just offering a new path apart from traditional methods, the strategy treats digital development as central for keeping pace with fast-moving industry waves.

In this line, Colombia saw the opportunity to make a new look at how machines think by suddenly launching in. That is why the nation began taking actions, beginning its course through what is called the National Artificial Intelligence Policy - titled CONPES 4144. From here, the work became concerned with identifying individuals with appropriate skills, good systems, and guidelines to make artificial technology plans work without causing unexpected repercussions. Based on the policy ideas, there are six directions: fairness in machine choices comes first; access to good data and contemporary equipment takes second place. Then, diving into studies that might stimulate new thoughts. Next is learning — not just for experts but for everyone interested enough to attempt. There are safety measures growing with such action to keep the dangers small. Finally, life in cities, offices and public services gradually weds this digital help.

Currently in Colombia, classrooms might feel far from technology across the country. Still, CONPES 4144 pushes for smart machines to play a clearer role in all learning spaces done carefully. Setting up country-level rules so artificial intelligence behaves properly inside schools. Internet connections also need work; better links help students actually use new tools. Programs giving kids computers could grow, reaching more towns than before. In the same line, ideas around safe tech habits may start showing up in official school papers too. Leading this shift falls mostly on the Ministry of Education, as it shapes how people see digital progress. Teaching what code can - and cannot - do becomes part of daily talk.

Seen as essential as water or electricity, Internet service is address across Colombia under new national standards set by Law 2108 in 2021. That means whether it is highland villages or coastal towns, each location must have access to this resource. As a matter of fact, connection should never depend on distance from urban centers. Since staying linked rests partly on

infrastructure, state policies must maintain their gear without pause, ensuring signals remain strong through storms, shifts, or time.

Another action taken is The National Digital Strategy which outlines a series of goals for Colombia with the ultimate objective of leveraging tech for both economic and social growth while ensuring that the benefits are distributed fairly. Access to quality information, new approaches to old problems, and a commitment to honesty in the deployment and use of technology are all essential for the type of online world that Colombia imagines: one in which no one falls through the cracks, even as everything moves at breakneck speed.

School plans for engaging contemporary problems with the analysis of artificial intelligence machines are just beginning to materialize, and they start with plans, like CONPES 4144 RoadMap, which look at future trends across Colombia. More than passive regulations of the way to use it everywhere, these plans also involve the consolidation of sufficient digital access and interoperability across the country — from the urban centers to remote areas on the other side of the country, often lacking support in a timely manner. Now, with global health crises on everyone's mind, securing the Internet's full-time use by all has become a much more pressing concern and one that requires a more balanced approach to the deployment of technology.

When it comes to science, technology, and innovation, Colombia has created a set of guidelines for artificial intelligence: *The Ethical Framework for Artificial Intelligence in Colombia*. Most mornings, Colombia thinks about machines that learn. This policy has been designed and developed to guide public policy and regulation towards the effective and responsible adoption of artificial intelligence in Colombia. The fact that AI systems are widely

regarded as a key component of what has been dubbed the fourth industrial shift while there is much to celebrate in this new phase of development, attention has focused on a number of issues that need to be addressed to ensure that AI systems are deployed and used fairly, not to exclude certain groups and to prevent the AI data deluge from being exploited for damaging or divisive purposes. Colombia's approach to AI should encourage good choices that do not damage third parties.

The main aim of this document is to provide public institutions with a framework to assess and design public policies and strategies for the use of information and communication technologies in general and AI in particular. fairness matters and AI are increasingly an important aspect of our daily lives; how it is used and developed needs to be guided by a set of principles that ensure that AI systems are safe and fair. One possible vision of how this could develop in Colombia has been outlined in this document, and how expectations are likely to shape decisions on AI in Colombia.

As an integrative national framework, The Ten-Year Education Plan 2016–2026: The Path towards Quality and Equity establishes a national framework to guide Colombian education policy with a focus on guaranteeing education as a fundamental right and a public service with a social function. The document places education as a central driver of human development, equity, social mobility, and institutional strengthening, in line with Article 67 of the Colombian Constitution and the General Law of Education. It outlines a vision in which education contributes to improving living conditions, closing social gaps, consolidating peace, and promoting sustainable development by 2026, while responding to the challenges of a global society and the advances of science, technology, and productivity.

Within this framework, the Plan emphasizes the relevance of technology and innovation in educational processes, highlighting the pedagogical and widespread use of information and communication technologies to support teaching, learning, research, and curriculum development. The document identifies persistent challenges, including inequalities between urban and rural areas, gaps in educational quality, and the need for flexible and participatory curricular models, positioning technological integration as a key element for transforming the education system and addressing the demands of the 21st century.

Finally, Law 1286 of 2009 establishes a national framework to strengthen Colombia's National System of Science, Technology, and Innovation by transforming Colciencias into an Administrative Department and consolidating science, technology, and innovation as strategic pillars of the country's productive and economic development. The law seeks to promote a culture centered on the generation, appropriation, and dissemination of knowledge, scientific research, technological development, and lifelong learning, with a clear impact on the education sector. It emphasizes improving the quality of formal and non-formal education to encourage the formation of researchers, innovators, and technology developers, as well as fostering the integration of scientific research with educational processes and the consolidation of research centers and groups within higher education institutions as key actors in national development.

CHAPTER V: Data Analysis and Findings

Making sense of twenty-two documents required a process that was both structured and open to surprise. Rather than arriving at the data with fixed ideas about what would be found, the analysis unfolded in stages, each one building on the previous, and each one shaped by what the documents themselves had to say.

The first stage involved selecting which documents would become part of the corpus. To do this in a transparent and consistent way, two holistic rubrics were designed (see Annexes 1 and 2), one for academic productions — undergraduate and master's theses, research projects, and journal articles — and another for policy and institutional documents. Each source was read as a whole and assessed against three evaluative dimensions: its relevance to the research question, its alignment with at least one of the three specific objectives, and its contextual pertinence to the Colombian EFL setting. Sources that met the threshold across all three dimensions were included. This meant that not every document encountered during the search made it into the final corpus only those that had something meaningful to contribute to the specific phenomenon being examined here.

Once the corpus was established, a document analysis matrix was built to organize the reading process systematically (see Annex 3). Each of the twenty-two sources was examined through a set of shared analytical lenses: the purpose of the document, its research, its relevance to TEFL in Colombia, the way AI was integrated or conceptualized, the methodological approach followed, the population addressed, the pedagogical or technological contributions proposed, the challenges and limitations identified, and the key definitions employed. This matrix served as a working tool throughout the reading process, making it possible to move across documents, compare what different sources said about similar issues, and begin noticing where ideas converged or pulled in different directions.

The second stage was open coding through color-coding. As patterns began to surface across the matrix entries, colors were assigned to recurring thematic clusters — not to confirm ideas that were already there, but to make visible what the data was consistently pointing toward. Each color marked a thread worth following something that appeared in multiple documents, in

different forms, but always circling back to the same underlying concern. As Bresciani (2015) notes, color-based visual coding helps researchers identify conceptual groupings within large sets of textual data, supporting a more systematic and transparent analytical process. This approach aligns with the inductive logic of Grounded Theory (Glaser & Strauss, 1967), which positions the researcher's sustained engagement with the data, rather than pre-existing theory, as the basis for conceptual development (Páramo Morales, 2015).

Through repetitive reading, four major categories consolidated from the coded data. It is worth stating clearly that these categories were not decided in advance. They emerged from the documents themselves, shaped by the density and recurrence of themes across the corpus. Each category was then organized into subcategories, which are described in the sections that follow.

5.1 Artificial Intelligence as a Pedagogical Tool in EFL:

This first category looks at how student teachers think about and use artificial intelligence in teaching and learning English. The studies show that AI is often seen as a helpful tool that supports learning that is tailored to each student, gets students involved and motivated, helps them develop their language skills, and produces new ways of teaching. All these things together show how AI is being used more and more to make learning easier and to change the way English is taught nowadays. The idea is that AI can help make learning more fun and effective, and that it can help teachers produce new and better ways of teaching English. By using AI, teachers can make their classes more engaging and help their students learn more quickly and easily. This can be especially helpful for students who are struggling or need a little extra help. Overall, AI is being used to make English language teaching more innovative and effective.

5.1.1 AI-driven adaptive learning:

The selected documents highlighted the role that artificial intelligence is increasingly playing in supporting personalized learning by enabling each student to follow learning activities best suited to their needs at any given time. Rather than teachers following a standard lesson plan, activities and resources could be tailored so that the learning is more relevant, immediate, and effective for each student. There is the aspect of immediate feedback, which means that instead of having to wait weeks for someone to mark down your attempts, you receive your results instantly. You get to see exactly where you are going wrong as well as exactly what you are getting right, allowing for a lot more independence than one would expect with such interactive software.

In recent years there has been a growing number of studies that report how AI systems can customize their content in line with a learner's progress, for instance, Moreno (2025) sees AI as an adaptative tool, explaining that educational content should be adjusted according to *"the unique needs and preferences of each student"* (p. 18). Similarly, Gonzalez (2024) states that AI can function as a communication support tool that facilitates *"greater personalization of learning and assessment"* (p. 9). Also, Gutierrez (2024) emphasizes that *AI can significantly impact teaching and learning processes by enabling applications focused on personalized learning* (p. 95). Consequently, the information reviewed supports the conception that AI goes beyond being just a technological innovation; it also works as a pedagogical tool that helps teachers and educational systems in general to respond more effectively to the different learning paces and language needs students face into EFL classrooms.

It is well known that technology has facilitated various educational innovations and also improved students' autonomy in language competences. In this regard and considering the selected studies it was possible to identify that many of the students were able to identify their mistakes made while conversing or presenting, indicating a degree of autonomy by the learner (Vargas, 2025, p. 39). In addition to that, Gutiérrez (2024) argues that AI tools might afford students autonomy to examine or improve areas where they are finding it challenging to learn English (p. 95). Combining these findings, we demonstrate that AI tools can also work as supportive learning companions, reinforcing self-monitoring and independent practice, as well as supporting students to grow their language skills beyond the boundaries of control spaces like classrooms.

Finally, instant feedback is a hallmark of efficient AI-driven learning. Intelligent educational software delivers personalized and immediate feedback to support learning, while recommends concepts most relevant to the individual learner. For example, *Fonseca (2021) found that intelligent educational systems provide personalized feedback designed to improve the efficiency and value of learning while supporting autonomous learning processes (p. 25)*. This is like what another study found; *Vargas (2025)*, described how an AI-based application acted in his action research as a learning companion that adapted to students' needs while facilitating constant and personalized feedback in their pronunciation skills. Students come to classes with specific needs and learn in different ways, so teachers need to be able to respond to such panoramas. The studies we looked at suggest that AI tools can help teachers complete students personal requirements by providing personal continuous feedback, letting students learn at their own pace, and giving them plenty of opportunities to practice. This can help create a more

flexible and student-centered way of learning, especially for students learning English as a foreign language.

5.1.2: Engagement and Motivation:

In the selected papers, artificial intelligence (AI) emerged as one of the key factors in enhancing engagement. AI was incorporated into various educational activities leading to a marked spike in students' attention and participation, as they found the tasks more interactive and meaningful. Studies in Colombia have found positive effects on student engagement when using AI-enabled tools and platforms for learning. The existing research, however, focuses mainly on immediate outcomes, such as attendance and instant student satisfaction, rather than longer-term engagement. This paper does not suggest any fault in the aforementioned research. Rather, there is a need for further research that builds on these findings and explores engagement in the longer term, especially as the initial novelty of AI wears off.

Findings from two studies suggest that technology-supported tasks can make language learning experience meaningful. Evidence from Vargas (2025) highlights that the integration of technological resources seeks *“to motivate students to view the target language as a meaningful tool for creating a better, more interactive, and appealing learning environment”* (p. 28). Pardo (2025) reports that *“when activities are grounded in familiar cultural and linguistic contexts, using tools like group narratives, interactive games, and personalized assessments, students show increased motivation and participation”* (p. 63). And research as the one from Jiménez Medina, Mejía Cortes y Quintero Gutiérrez (2024) explains that intelligent tools can identify areas of difficulty and *“dynamically adjust the content, offering an adaptive and motivating experience to improve results”* (p. 20). Previous examples illustrate how AI-supported

environments can transform foreign language learning into a more interactive and meaningful experience for students when using tech tools.

Another relevant dimension concerns the connection between feedback, autonomy, and motivation, three key factors in language leaning. Thinking about this specific point, Sanchez (2025) explains that tools such as ChatGPT and platforms like the British Council, based on his research, can contribute to strengthening learners' autonomy, motivation, and academic performance. In favor of his perspective Valdéz (2025) argues from his results that these technologies not only support academic achievement but also enhance students' motivation, autonomy, and confidence when using the language. Both perspectives suggest that AI tools help to create learning settings where students feel more confident and motivated to participate actively in all language learning activities they face.

Looking at how teaching has been addressing by some preservice teachers in Colombia, what we have found shows that AI can give educators new ways to mix up lessons, tasks, and group work when teaching English. If educators face a situation where many learners rarely hear or speak English beyond school walls, so it often feels out of reach. The possible solution might be AI-powered tools, students gain access to real-time dialogue, smart feedback systems, sometimes even role-play chats - things that pull the language into their real world. Because of this change, teachers shape classes that create interest, keep energy high, and draw students in. Far from pushing aside traditional methods, technology widens the range of choices available for building lively spaces where young people actually want to use another tongue.

5.1.3. Language Skill Development:

This part looks into ways artificial intelligence acts like a teaching tool helping students grow their English abilities when learning it as a foreign language. Right from the start of this work, one point stands clear: AI helps break limits - not just those tied to location or schedule, but also those created by speaking different languages. Tools such as instant translation and communication across multiple languages let learners reach information outside their own speech and background. In research done by future teachers, building language skills shows up often as a central way people see and use AI in classrooms where English is taught as an extra language. Across the academic studies conducted by pre-service teachers, language skill development emerges as a key pedagogical dimension through which AI integration in EFL learning is understood and implemented.

Confidence grows when learners get repeated chances to speak. The analyzed literature frequently emphasizes the function of AI-supported tools in fostering oral communication and language learning. For instance, Vargas (2025) reports that *“the more confident the students become in terms of pronunciation, the more likely they are to answer questions and keep trying to improve”* (p. 48), suggesting that AI-supported practice environments can strengthen students’ confidence and participation in oral communication performance. Correspondingly, Moreno Salazar, Parra Cantor y Rodríguez Torres (2025) suggest that intelligent technologies contribute to making the feedback process in foreign language learning more effective while fostering continuous curiosity too. This, in fact, encourages learners to seek new information by their own and work on their knowledge through more practical engagement. These previous examples show how AI tools can facilitate continuous exposure to the language, an essential component in the development of communicative competence. The fact that a classroom using speech

programs noticed students leaning into challenges instead of stepping back. Practice built resilience, almost like muscle memory forming over weeks. Each attempt sharpened their ears just a little bit more. Speaking became less about fear, more about forward motion.

There is a wide variety of technological resources that offer communication activities whose objective is not limited solely to conversational activities for practicing speaking skills. They also facilitate the acquisition of reading and writing skills. As already mentioned, real-time response systems and rapid calculation capabilities allow young people to engage in conversation and receive immediate feedback on their actions, with these exchanges occurring throughout the entire conversation. According to Moreno Salazar, Parra Cantor y Rodríguez Torres (2025) digital resources create dynamic learning environments that give access to the creation of authentic materials, simulated activities, and immediate feedback, which certainly influence aspects of language comprehension and production.

From a teacher's point of view, recent results show AI in English learning often appears in scholarly work as a way to improve language skills using tech support. Because it provides real-life content, chances to talk, and help with writing, artificial intelligence widens the space for practicing English - especially when learners rarely hear the foreign language beyond school walls. So far, data indicates machines powered by algorithms might act alongside educators, helping shape lessons meant to sharpen student expression. That said, growing analysis among training teachers treats smart systems less like gadgets and more like useful methods for building fluency in foreign-language classrooms.

5.1.4. Pedagogical Innovation and Educational Impact:

Colombian studies light how machines are shaking up English classes. Not long ago, web tools and computerized tests turned into salvation when normal schooling hit rough patches. Right there in the mix, artificial intelligence shows up not taking over, but slotting in beside teachers. It tweaks routines, opens fresh paths for study, even reshapes what assignments look like. Slowly, the whole rhythm of learning shifts - smoother, sharper, less rigid. Progress often hides in quiet upgrades. Teaching breathes differently now. Students find ways that fit them, not just the textbook. Results tighten up because attention sticks where it should. Grading papers takes time, yet artificial intelligence might handle it swiftly instead. Teachers could spend those saved hours working directly with students rather than sorting through assignments. Learning a new language feels different now because smart systems adapt quickly to how each person progresses. Efficiency creeps in quietly when routines become smoother without extra effort. Enjoyment often follows when lessons stop feeling like chores. Change arrives slowly, though classrooms may never look quite the same again.

One thing stands out across the reviewed materials - certain artificial intelligence tools show real promise in helping people learn languages. For instance, Moreno (2025) reports that *“Talkpal.AI had a positive impact on students' English pronunciation skills. Students who used the tool showed a significant improvement in their English-speaking ability compared to students who did not use the application”* (p. 34). This type of evidence demonstrates how AI applications can support the development of specific language skills while complementing traditional classroom instruction. Expanding on this Gutierrez (2024) argues that *“AI continues to transform the way we access and process information, the need arises to examine how these developments are shaping the future of language learning and, more specifically, the role that*

new foreign language teachers will play” (p. 113). As mentioned earlier, the researcher also argues that as AI continues to transform the way we access and process information, the future of language learning as well as the role of new foreign language teachers is being shaped by these developments; AI does not restrict itself to single digital tools and new functionalities, but it changes the very aspects of our life in meaningful ways.

Discussions about AI in educational institutions are closely linked to shifts shaped by digital technologies and developing policy guidance. From this perspective, the National Planning Department of Colombia (2023) explains that digital transformation means much more than just transferring information, as it requires the use of unknown technologies like AI alongside the development of guidelines and strategies to address new challenges. It is really important to offer students access to diverse learning environments where science and technology can be explored through hands-on interaction with modern tools (National Planning Department 2019). Considering both points of view, we can state that bringing AI into educational contexts is part of a wider, ongoing effort to strengthen teaching and learning practices. For this reason, its implementation in daily classroom routines should keep aligned with broader educational goals rather than functioning as an isolated initiative.

A clear view emerges from the results: AI is gradually becoming a spark for novel thought and ideas about teaching methods and school progress in Colombia. When analyzing selected documents, it is found that AI tools seem able to align with existing approaches to instruction, providing different methodologies of learning, while also illustrating that effective approaches can be replicated in an English as a Foreign Language environment. What’s more, the practices put in place by the trainees — the teachers themselves — do more than record what

happens during certain lessons; they also contribute to the conversation about how new AI might reform language classrooms and meet the educational needs of the current day.

This category connects directly to the understanding of AI established in Chapter II, where AI in EFL contexts was defined as a pedagogical tool designed to improve learning rather than replace human instruction. The findings above confirm that framing: pre-service teachers in Colombia are already positioning AI in precisely this way, though not always systematically. As a future EFL teacher, this is encouraging: it suggests that the theoretical conversation and the classroom reality are closer than one might expect.

5.2. Ethical and Responsible Use of Artificial Intelligence in EFL:

As AI increasingly enters EFL classrooms, more and more questions are being raised regarding what is the ‘right’ way to integrate it, as well as the ‘right’ people to be responsible for assessing its effects. Do we need to go beyond understanding what AI is and think more deeply about how it is to be used—by whom, how, and with what students learning from machines entails also confronting and questioning issues of bias, privacy, and fairness? Are those most responsible for integrating AI into classrooms—principally teachers—equipped not only to wield the technology but to make judgments about how and when to use it? While some regulations are in place in some contexts and are slowly being enacted in others, guidelines, frameworks, and training programs are also slowly being put in place in schools and organizations. As with any technology, there are always risks involved in how it is used—often in an instant, without fully realizing the potentially invisible harm it could cause. The awareness of these risks, however, can grow rapidly, and this is what is foremost in our thinking about AI and education.

In the end, technology belongs in education when it is used thoughtfully. Awareness of AI's risks and benefits grows incrementally, not immediately, and the time has come to confront the fact that trust in technology does not arise from code but from conduct—how we decide to act with it, over time, in particular situations.

5.2.1 Ethical Awareness Among Academic Population:

As Colombian scholars studied how people think about right and wrong when technology is introduced into educational spaces, they quickly came to realize that the process of thought and conversation takes time, and that learning about issues of fairness, bias, and responsibility regarding AI requires engagement and dialogue. The evidence-based line of care for this selected set of writings emerges from the scholars' observations and care regarding how teachers and students think about these critical issues. Although the papers reviewed here do not all loudly proclaim the importance of ethics in education and technology, the accumulation of studies, commentaries, and stories highlights the significance of ethics in the spaces and practices of schools. There is some cause for optimism, such as seen in the Chilean project *Artificial Intelligence: Foundations, Citizenship, and Ethics*, which brings together skills and active citizenship to explore technology issues within an educational context. A common thread throughout the writings reviewed here is a focus on instilling students, teachers, and educational school networks with an ethics perspective so that interactions with AI are guided by reflection and care.

Looking at what researchers have found the study from Arguello Toloza, Galindo Sarmiento y Gonzalez Yate (2025) also *reported that although students demonstrate the ability to use AI tools for learning purposes, they are often not fully aware of the ethical implications of*

these technologies, a limitation that can influence their attitudes toward learning and academic integrity. Information derived from these points of view demonstrates the technical ability to use AI does not necessarily guarantee responsible or critical engagement with the technology used.

From Colombian studies, we know that educational institutions and public policy are important factors to foment ethical awareness of risks related to AI. In this sense, the National Planning Department (2025) points out that the Ministry of Education in Colombia together with the Ministry of Science, Technology and Innovation, is encouraging higher education institutions to introduce in their academic programs training in ethics on AI systems, as a way of preventing and facing risks of AI systems. Guío Español, Tamayo Uribe, and Gómez Ayerbe (2021) highlight the need to design educational and training programs for higher education on the features and impacts of technologies of AI and artificial intelligence, with an ethical training approach.

Integrating AI into EFL teaching and learning implies on educators and students a development of their moral judgment. This article reviews selected research with a focus on how it shows a growing concern among scholars with respect to the consequences of distributing access to AI, i.e., encouraging students to adopt critical stances toward the use of AI, cultivating reflection, and fostering appropriate behaviors. As access is becoming increasingly available, developing moral education that promotes the proper use of technology implies cultivating learners' moral reasoning in order to ensure that AI is used to support meaningful learning.

5.2.2. Regulation, Governance, and Data Protection in Artificial Intelligence Use:

In this study, my focus is on the use of artificial intelligence in EFL context in schools. That is the reason one aspect of this study seeks rules, supervision and dealing with student

information after the use of artificial intelligence. As recently there are no advanced nationwide policies on privacy or managing tech tools, it is difficult to keep learning environments fair, secure, and open for everyone to use it.

The research suggested some of the national and institutional actions that we need to regulate the development and implementation of AI in EFL contexts. For instance, as described by the National Planning Department (2025), *“given Colombia's current conditions, it is necessary to develop new and decisive actions in areas such as ethics, governance, technological infrastructure, skills and talent, R&D&I, among others, so that AI becomes a reality in the country”* (p. 33). That the effective use of AI in educational contexts requires the interlacing of policies, academic studies, and capacity development. By way of analogous action, outcomes discovered in the same study highlight that Colombia has embarked on the very first step in such a development process to create *“the first Ethical Framework in Latin America”* given the pace at which digitalization and AI are being implemented in the face of rapid transformation (p.17). These findings are consistent with growing recognition of the importance of ethical and regulatory principles as guiding principles for technological innovation.

Data security is also highlighted in some studies by both pre-service teachers and academics, closely linked to the use of AI within educational settings. Guío Español, A., Tamayo Uribe, E., & Gómez Ayerbe, P. (2021) have detailed in their research the potential dangers of false and misleading information when using AI, some unfair systems, possible exclusions, and discrimination, weak or ineffective online defenses, or the exposure of personal data. Due to these concerns, the intelligent use of AI requires a distinction between right and wrong, as well as the construction of real barriers and policies that can protect individuals and their information. The use of AI in educational contexts needs rules that people can actually understand,

management plans to follow, and robust safeguards to protect student data. Without genuine discussions about the decision-making process, there is little chance that such technology will be fair, feel trustworthy, or achieve anything that schools — and society — truly value.

5.2.3 Institutional Ethical Training Initiatives:

Most schools shaping future teachers pay little attention to ethics in artificial intelligence. Though smart tech spreads through classrooms faster every year, fewer than two out of one hundred courses tackle AI directly. One reason might be tradition holding strong in teaching methods. Few realize how far behind educator training has fallen compared to tech advances. When lessons skip over responsible use of machines that learn, classrooms risk unprepared guidance. Without deliberate inclusion, ethical knowledge slips through the cracks. Some programs nod toward technology yet avoid deeper questions about fairness or bias built into systems. What gets taught shapes what students believe is normal. Missing pieces in curriculum means new teachers step into schools without tools they may soon need. Gaps like these grow wider while innovation moves ahead unchecked.

The reviewed literature highlights the need to strengthen institutional capacities to address ethical considerations in the use of AI. Evidence from *National Planning Department* (2025) suggests that “currently, national capacities are insufficient to verify compliance with ethical principles in AI applications, systems, and uses” (p. 44), showing the challenges associated with monitoring and ensuring responsible technological implementation. In response to this situation, the same source indicates that “in 2025, a guide of recommendations for the ethical and responsible implementation of AI will be developed, aimed at all organizations in the private sector, academia, and private research ecosystems” (p. 84). These plans illustrate

growing institutional efforts to establish guidelines that support the ethical integration of AI across educational and complex environments.

In order to take full advantage of the technological skills available to them, the academy seeks to develop structured teaching approaches which systematically incorporate new technologies and AI into organized, consistent, and planned learning environments. That is why both Pérez-Montero and Hernández-Henríquez (2025), as well as the study *Incorporating ChatGPT: Ethical, Editing and Training Aspects for Graduate Students* (2024), argue that while technology can complement the teaching process and support effective learning, students also need to understand how to use technology appropriately and in a balanced way to achieve quality learning outcomes. Technology use can threaten writing skills and the ability to think for oneself. Ethics training also needs to be incorporated into a number of practical examples in order to help students understand and manage the ethical implications in academic use of AI.

In other words, schools and scholars have an important role in the process of teaching ethics for intelligent technology. A central reason that supports this idea lies in the evidence collected, as studies indicate, for this researcher, that learning environments in which students engage, colleges must establish clear standards, offer practice-based courses, and improve methods of delivery. One possibility could be by including AI ethics in teacher prep classes in order to achieve that instructors instruct students using new tools wisely. Even though their task is not simply instructing, the fact of giving guidance informed by fairness is needed, thoughtfulness and practical value to the classroom. Without taking action on these concerns, progress risks moving faster than understanding.

The ethical considerations discussed in Chapter II – particularly the principles of transparency, fairness, and accountability outlined in the Ethical Framework for Artificial Intelligence (Guío Español et al., 2021), find direct relevance here. What the findings of this section reveal is that awareness of these principles exists, but structured institutional responses have yet to follow. As a future EFL teacher, this gap feels particularly urgent: using AI responsibly requires more than access to tools. It requires the kind of critical preparation that programs have not yet systematically provided.

5.3 Limitations and Challenges in the Integration of AI in EFL:

Introducing AI into educational processes in Colombia tends to be a different matter. Difficulty occurs more quickly when AI is introduced into educational processes. It can be inferred that the absence of an internet connection is slowing the proceedings, especially in rural areas. Most of the time, students from these areas face fewer opportunities to actually get the chance to speak or practice the foreign language outside a control space, even when that space does contain smart software. Traditional methodologies in schools obstruct the shift more than they would like. Teachers frequently lack training to cope with the need for new artificial technology demands. Disbelief rises when work feels too automated or copied by others. In practice, support from national policies remains either weak or unclear. There are Tech Tools, yes, but classrooms are stuck without proper support. Learning does not shift just because machines show up to learn a new topic. What is happening inside schools shapes the outcomes more than tech devices ever could.

5.3.1. Lack of Time and Limited Practice Opportunities:

One challenge stands out across studies on using AI in English teaching here. Though schools try new methods, learners rarely hear English beyond class walls. Since the pandemic shifted routines, tech stepped into bigger roles than before. Not just backup plans digital tools began reshaping how people connect and learn. In this shift, artificial intelligence appears capable of shrinking gaps tied to location, schedules, or chance to engage. Conditions in Colombia make such shifts more urgent than obvious.

Looking back at the research, it becomes clear how little room students get to practice English on their own. In this regard, one study states that *“EFL presents a challenge for students, especially when faced with barriers such as lack of time, limited practice opportunities, and technological limitations”* (Moreno, 2025, p. 7). Another analysis points out that *“one key issue was the lack of autonomous practice outside the classroom, as many students did not engage in self-directed learning at home”* (Vargas, 2025, p. 3). This evidence demonstrates that language learning in many Colombian educational environments still depends on classroom interaction availability, which restricts students’ exposure to the foreign language outside these places and limits the continuity of practice that language learning asks for.

Consistent with previous arguments and evidence highlighted, broader technological perspectives presented in the reviewed documents point out the transformative potential of AI to respond to these limitations. For instance, the National Planning Department (2025) explains that *“AI is a versatile technology with the ability to improve people's well-being, drive a more sustainable and favorable global economy, foster innovation and productivity, and contribute to solving important global challenges”* (p. 33). Likewise, policy-oriented discussions highlight

that technologies such as AI can strengthen countries' capacity to innovate and address emerging challenges (National Planning Department, 2023 p, 6). Once we take a closer look, suddenly AI is not merely an upgrade for teaching or learning it becomes a way to stretch students' competences in Colombia beyond what traditional classroom allows to.

Reflecting on earlier theoretical discussion, technological tools offer ways that might relieve some of the problems that arise while reviewing the data. For example, if we picture a student trying out new phrases in English - AI gives the opportunity through a chat programs or smart replies that act like real talk. These digital spaces respond when spoken to, making practice feel less scripted. Instead of waiting for teacher comments, help arrives right away through screens. Some platforms even mimic everyday talks, giving chances to use words in context. Learning gets quieter, slower, repeated - not forced.

Looking ahead to teaching, I see a push and pull forming - old ways of learning languages often fall short, yet AI tools might open new doors for practice. Not enough hours in class, plus scarce contact with English, weigh heavy across Colombia's schools; here, artificial intelligence could stretch moments into more chances to engage the language outside school walls. Still, none of it matters much unless educators learn how to weave such tech into actual lessons, so students keep using words meaningfully instead of treating digital help like extra homework.

5.3.2. Technological Limitations:

Unequal access to intelligent tech tools stands out as a major roadblock when bringing AI into English teaching spaces across Colombia. Earlier findings showed how the pandemic reshaped schooling everywhere, pushing it firmly into online formats where screens replaced

desks. Because classes moved online, having reliable internet and devices stopped being optional - it became essential just to show up. Yet in Colombia, that shift laid bare stark gaps between those who can log in easily and those who struggle to connect at all. These divides make it tough to bring smart software into everyday language lessons fairly.

Evidence from papers reviewed back up the idea that setup problems run deep. For instance, one policy report states that *“the persistent gaps and poor quality of internet access, especially in remote regions of the country, prevent the incorporation of these territories into the AI ecosystem”* (National Planning Department, 2025, p. 47). In addition to that, national data also shows that technological infrastructure remains limited, it was argued that *“in Colombia, access to digital technologies for students remains low, particularly in public schools... the average number of students per computer was 8”* (National Planning Department, 2023, p. 27). Data obtained from policies illustrate how structural conditions related to infrastructure continue to affect the possibilities of implementing digital innovation in educational settings, when talking about EFL classes.

Even with such limitations mentioned above, data reviewed sources also indicate that the aim of national programs is also to solve technological shortcomings. Government strategies propose strengthening internet access at national and regional levels in Colombia between 2025 and 2027; by doing so, it facilitates AI ecosystem development (National Planning Department, 2025, p 84). In fact, Law 2108 of 2021 of the Congress of Colombia (2021) establishes internet access as an essential public service intended to guarantee connectivity for all citizens, particularly those living in vulnerable or rural areas.

When I use the evidence from my data, in the light of the theoretical perspectives mentioned earlier, the focus shifts to the classroom. Language rules and norms, school guidance and resources, existing classroom practice and technology setup all come into play. Tech barriers can be frustrating, but they also limit how frequently English is used and by how many learners within existing learning activities. So even if AI promises big changes in language classes, ignoring real-world tech limits makes those talks feel far removed from actual classrooms. Most schools still lack steady internet, so even smart tech cannot always help. Where power devices are unknown, new methods stall before they start. Without fixing basic access, clever software sits unused on distant servers. Some villages rely on paper while cities test algorithms. Real progress means wiring remote classrooms first. Only then might digital tutors reach those who need them most.

5.3.3. Risks to Critical Thinking and Academic Integrity:

One big question now shaping EFL classrooms involves how AI might influence student thinking and honesty in schoolwork. Not every country has caught up - Colombia included - when it comes to setting clear rules around smart tech in education. Old frameworks still stand, even though they say nothing about using artificial intelligence responsibly. Because these standards have not changed, learners are not taught how to handle such tools as part of their growth. Without fresh direction, uncertainty grows about what's expected when digital helpers appear more often in daily study routines.

Here things get trickier because Colombia still has not finished building solid rules for using AI in classrooms. With no nationwide direction on keeping data private or handling smart tools responsibly, schools are left guessing about proper usage. When support is missing,

learners might lean too heavily on machines, which could dull the thinking and analysis crucial for mastering a new language.

Insights from the reviewed texts reinforce the importance of addressing this matter. For example, documents, such as policies reveal the difficulties institutions face when attempting to regulate the responsible use of these technologies, as a matter of fact “*currently, there are no tools available to incentivize, verify, and measure the application of ethical principles throughout the AI lifecycle*” (National Planning Department, p. 19). Correspondingly, the same policy indicates that it is difficult to determine whether students possess the competencies required to interact critically with AI-based systems as “*the country lacks assessment tools that allow for a diagnosis of the digital skills and competencies of the school-age population*” (p. 57). Taking actions to these challenges, educational discussions increasingly emphasize the importance of empowering learners to participate actively in the development and responsible use of technology. In this regard, it is suggested that “*it is necessary to empower young people through education, participation, and co-design of AI*” so they can influence how these technologies are developed and applied (Guío Español, Tamayo Uribe, & Gómez Ayerbe, 2021, p. 11).

The ethical guide for AI development also provides mechanisms to ensure that human supervision and management of said technologies are carried out correctly during the decision-making process in which they participate. Specifically, the previously commented “*human-in-the-loop*” principle guarantees that the human is in charge of decision making in all the stages of the system Guío Español, Tamayo Uribe y Gómez Ayerbe (2021). Thus, AI should be considered as a support system for decision making and, what is most important, it cannot replace human judgment. Just when you could think that someone has similar perspectives as

me, your point of view could change when artificial intelligence is introduced in environments as the ones in which academic places are assigned.

When these findings are considered alongside the understanding of AI conception presented earlier, an important perspective emerges. This research sees AI not as something replacing people, but it is built to boost how humans think, talk, through problems. Seen this way, using AI in schools pushes learners to dig into ideas, weigh facts, stay alert instead of just accepting quick machine answers. Just as clearly, numbers show it matters how we see AI - less like a shortcut for schoolwork, more like a device needing care, thought when used. What matters most is not whether AI exists in classrooms, but how students are taught to work alongside it. With clear direction, intelligent technologies help fuel curiosity, original ideas, and better communication skills - yet left unguided, it might lead learners toward mindless copying instead of deep understanding or honest scholarship.

5.3.4 Pedagogical and Institutional Gaps:

This part looks at how teacher preparation falls short, along with missing step-by-step teaching methods for using AI in English classes where students speak it as a second language. Earlier sections noted that AI now plays a key role in shaping new ways schools operate, pushing educators to shift how they teach and adjust to tech-heavy classrooms. Still, when focusing on Colombia, what researchers found shows a wide disconnect, while worldwide talk pushes for bringing AI into lessons, actual school policies fail to give teachers the backing needed to use such tools well.

Most new teachers leave school unprepared to use smart tools in classrooms. When researchers looked at what is taught, they found tech lessons take up almost no room in training

programs across Bogotá. Fewer than two out of every hundred classes talk about digital methods in teaching. Hardly any mention artificial intelligence by name. Teacher preparation leans heavily on old models, leaving gaps where modern skills should grow. Without exposure during study years, graduates miss chances to learn how machines can support language learning. What gets left out shapes what happens later inside schools.

Evidence that supports such idea lies in the texts reviewed, there is an absence of pedagogical guidelines that orient the use of AI within educational systems. One policy report explains that *“Colombia lacks evidence on the level of development of digital skills among teachers, which prevents the implementation of targeted actions for the development of digital competencies and pedagogical practices that enable the transfer of knowledge and the incorporation of emerging technologies in teaching and learning processes”* (National Planning Department, 2025 p. 58). Following this idea it was also highlighted that national strategies recognize the need to strengthen digital capacities, noting that it is necessary to accelerate processes of digital literacy and promote the adoption of digital technologies within the education system (p, 27).

However, some initiatives from different sectors have been working to address these institutional gaps. For instance, governmental strategies propose the design of training programs that include AI literacy for the Colombian population and the implementation of educational initiatives intended to integrate the pedagogical and responsible use of AI within teacher and student training processes between 2025 and 2030 (National Planning Department, 2025). Colombia’s discussion about the policies for improving education policy and practice in the use of technology emphasizes the importance of ensuring that teachers are trained to integrate technology as effective tools to support teaching and learning, rather than ends in themselves that

can be addressed at any level in education or become the focal point of a teacher's job (Ministry of National Education of Colombia, 2017). This structure guide to strengthen teacher training is beginning to be put into practice but still is in a developing stage and lacks implementation.

Based on the data, this paper evidences a core mismatch in schools. Even though AI gains attention and popularity as a powerful aid in education, most teachers prep courses still ignore it as a key competence to develop. If educators are not trained well in their teaching competences, confusion might appear. Higher education programs are not adding AI to lessons even in language subjects, which is missing deeper benefits. Unclear on purpose, some treat it just like another fun app. For AI to truly help students grow in language skills development, schools, colleges and even the National Ministry of Education must rethink how they prepare instructors. Otherwise, there is a risk in fading just noise amid shifting styles. Closing this gap is not currently an option – it is built into what effective teaching now asks for.

The TEFL framework from theoretical foundation emphasized that in contexts where English has limited presence beyond the classroom, structural conditions shape what is actually possible in teaching. Tedesco's (2009) notion of policy as a tool for equity adds weight to what follows: the barriers documented in this category are not incidental, they are systemic. As someone preparing to teach in Colombia, these findings describe realities I expect to encounter directly.

5.4. Artificial Intelligence Educational Policy and Institutional Support in EFL in Colombia:

Investigating AI usage in English classroom teaching practiced in different locations across Colombia involves not only exploring the available technological resources, but it also

involves analyzing and consulting the school's policies, rules, and support mechanisms. Given that the national educational plans and policies outline what has been done in terms of AI usage in English teaching within Colombia, government direction clearly has an influence on what is possible in terms of AI usage in terms of accessibility. However, with internet accessibility increasing and slowly changing to take advantage of new technologies, the progress that is observable does take time, and it will take more planning and effort to make lasting changes to pedagogy through innovative teaching methodologies and lesson planning. Stronger policies aside, the implementation and usage of AI for learning a foreign language within a school setting will ultimately be determined by how well educational decisions correspond to specific actions taking place in schools and how new approaches to teaching and learning are put into practice within actual English language instructional classrooms.

Read alongside the educational policy framework from Chapter II, the documents analyzed here reveal a persistent tension between institutional ambition and classroom reality one that Tedesco (2009) would recognize as the gap between policy as regulation and policy as genuine developmental strategy. Understanding where that gap sits, and why, is part of what this category sets out to map.

5.4.1. National Artificial Intelligence Policies and Guidelines Development:

Currently, Colombia's push to weave artificial intelligence into schools shows up mostly through official plans and teacher's research. It is possible to spot it in government papers and national roadmaps pulled for review - most writings on AI here lately come straight from agencies or rule-making bodies. That inclination toward rules hints people in charge see smart tech as key for progress, especially in learning and digital growth. Remember the start? The

pandemic shook things loose. Suddenly, AI was not just for factories or apps - it started reshaping how we talk, create, teach, and even think.

Colombia's educators show movement toward AI, though clear limits still stand. A growing number of universities now offer courses tied to artificial intelligence – which previous data confirms. Yet these efforts mostly live inside tech-focused departments, skipping past areas like teaching languages. Language classrooms rarely see AI woven into daily work, even as other fields push ahead. The last update to foreign language standards happened back in 2020, long before recent shifts in technology took hold. Since then, no new expectations around digital technology have entered those guidelines. Languages students finish school without any formal exposure to machine-driven tools in language study. That delay hints at a wider mismatch - one where classroom rules stand behind real-world changes. What happens in schools does not reflect what machines already do outside them.

Results from documents also showed how Colombia is gradually constructing a framework to guide the adoption of AI. However, regulatory development remains at an early stage. Several initiatives have been proposed to strengthen the integration of digital technologies in the educational system. As a matter of fact, broader educational policies emphasize the importance of preparing citizens for the technological transformations associated with the Fourth Industrial Revolution. National strategic plans highlight the need to “*promote the relevant, pedagogical and widespread use of new and diverse technologies to support teaching, knowledge building, learning, research and innovation*” ((Ministry of National Education of Colombia, 2017, p. 17). Similarly, policy proposals reviewed suggest that the MEN should design curricular guidelines that promote the development of competencies related to emerging technologies, including AI, throughout students’ educational trajectories (National Planning

Department, 2019, p 47). This evidence indicates that the integration of AI into educational contexts is widely recognized as a national priority, particularly in relation to preparing future generations for technological and social transformations.

Given what has been looked at, we find Colombia standing between steps in the process of establishing the rules around artificial intelligence in schools. Although leaders recognize AI as an important value, they still prioritize tech industries rather than classrooms, and do not even look to areas such as teaching English. And so, the need to relate government plans to real needs in the classroom seems pressing because of the gulf. Meaningful change of broad strategies to specific teaching practices, support for educators, and updated lesson aids could redefine how technology affects learning. This shift may enable AI to apply not just to machines — but to students and teachers too.

5.4.2. Infrastructure Development Initiatives:

Infrastructure Development Initiatives indicate at an institutional and political levels the effort in contributing to the strength the technological base for the integration of AI in Colombian education. As the preceding documents indicate, the exponential growth of AI innovation in education has created various new possibilities but it has also revealed structural inequalities in terms of access to the proper devices and their connectivity. Truly, it has been pointed out that because AI tools have developed so rapidly, the risks of not having equal access to generative tools have increased too, particularly in rural areas where underdeveloped information technology infrastructure amplifies existing digital divides. Under these conditions, we can say infrastructure becomes a decisive factor in determining whether educational institutions are able to adopt and benefit from AI-based educational resources.

Governmental plans have been introduced to address these infrastructural challenges and expand technological access within the education system. One notable example is the Computers for Education program, which benefit the delivery of digital devices equipped with educational content and pedagogical tools to official educational institutions throughout Colombia (National Planning Department, 2025, p 93). Alongside these efforts, public strategies have also proposed work on technological infrastructure more broadly into the public sector. Findings revealed that *“between 2025 and 2027, a strategy will be designed and developed for the strengthening of AI technology infrastructure in the public sector”* (p. 87). Documents information illustrates a growing institutional awareness that technological infrastructure must advance in order to support the incorporation of new artificial technologies in education.

National educational planning also emphasizes that infrastructure should be a major component to extending the reach of and enhancing educational settings. According to Strategic proposals for the Colombian education system, by 2026, educational infrastructure should be closely integrated with information and communication technologies to support quality and access. Taking up the policy argument, the policy guidelines also stressed the importance of *“guaranteeing the technological infrastructure and the physical and connectivity conditions of official educational institutions throughout the national territory”* so that *“the areas with the greatest needs are to be allocated priority”* (Ministry of National Education of Colombia, 2017, p. 54) By virtue of these, infrastructure development is now put not just as a technological priority but also as a tool to furthering educational equity.

Legislative frameworks further shape the country’s approach to technological development along the lines of education and educational policy. The State is responsible for facilitating access to and use of ICTs; the efficient deployment of technological infrastructure;

and assistance in human talent development as part of the consolidation of Colombia's information and knowledge society under Law 1341 of 2009 (National Planning Department, 2019 p. 15). Framing technological access as a national priority, this legal basis offers institutional support for programs designed to build digital capacities across sectors, such as education.

The findings suggest that the potential of AI in education cannot be addressed in isolation from wider issues of technological access. National approaches to leveraging technology to enhance education are interesting but their success is likely to depend on educational institutions having the capacity to access these areas, particularly in less affluent regions of the country. Access to reliable connectivity, devices and technological resources is therefore crucial if AI is to be used as an innovative means of enhancing access to education, rather than exacerbating existing inequalities, particularly in relation to EFL-learning situations.

5.4.3. Curriculum Integration of Artificial Intelligence and Reforms:

This subcategory describes how national educational discussions are starting to address the uptake of AI in curricular structures. As indicated, the advent of AI in education has reoriented the role of teachers who need to not only be controllers of the subject matter but facilitators as well, who can strategically leverage AI in educational environments to enhance learning. And that new nature means that curricular structures have to change to conform to educational experiences and contexts that are reshaped by digital transformation.

Indeed, from analyses taken on the data compiled, contemporary educational policy discussions in Colombia stress the function of higher education systems in this matter. In these regards, the National Planning Department (2025) explains that in the country, for the

development, use and adoption of artificial intelligence tools, education institutions like colleges, need to participate in them. More than their educational responsibilities, colleges are also responsible for developing and conducting courses that include digital skills training for students. By these actions, educational institutions are in a position to become the primary actors involved in educating future practitioners whilst ensuring even more of the future teachers who can manage effectively with the technological needs in an all-interconnected educational environment.

Curriculum changes will always be ongoing. When countries change courses, schools need to adjust as well. The concept pops up frequently in policy rhetoric. Take the National Education Plan. It pushes open dialogue that speaks to many voices as it is shaping what students learn “*continuously update the curricular designs of education and training programs, taking into account national and international dynamics*” (p. 44) Flexibility is crucial once technology is moving so quickly. Old designs crack under new tools. Structures that bend help keep pace, rather than snap.

Data was collected and analyzed in order to understand connections between classroom use of artificial intelligence and the school curriculum. What was uncovered was that, in order for teachers to effectively integrate artificial technology into their classrooms, the new changes to the curriculum for lesson plans need to include more focus on digital skills. This does not mean simply introducing a new topic to the scope of schooling for students— schools need a more profound transformation in the way that they deliver education in order for students and teachers alike to thoughtfully and inventively incorporate these new technologies into the classroom.

5.4.4. Institutional Adoption and Implementation:

The Institutional Adoption and Implementation subcategory is concerned with the degree to which schools adopt the AI integration in their teaching and learning environment for EFL classes. In addition to early-stage policies and developing national strategies, the successful adoption of AI is highly based on the extent to which the institution will utilize the guidelines as teaching practices, professional development programs, and technological underpinning. As this research tries to stress, the integration of AI into education does not imply just providing the technology but also enduring institutional support for creating environments where innovation, digital literacy, and pedagogical reflection can grow in duo.

Institutional adoption of AI is closely linked to the ability of educational systems to prepare the educational population to understand and interact with new artificial technologies. In this regard, one policy document reviewed highlights that *“incorporating digital skills and competencies throughout the life cycle, from basic education to higher education, is also fundamental to facilitating the understanding and participation of all people in the use and application of AI systems”* (National Planning Department, 2025, p. 55). Based on this evidence it is possible to state in this paper that institutional strategies must address digital literacy as a long-term educational objective rather than as an isolated initiative within specific academic programs.

Yet another mechanism that operates on a direct way is the role that teachers have on the process of technological adoption of AI in education, since their role and qualifications in the educational process of students is crucial for the quality of education, considering that the level of training of educators has a positive impact on the quality of education. For this reason,

institutional adoption of AI requires more than just technological resources. Also necessary is the training of teachers for the effective insertion of AI tools in their pedagogical practices.

When schools and research teams work together, it can lead to new and exciting ideas. Latin American countries have plans to make science, technology, and innovation stronger by having universities, research centers, and technology companies work together. For example, in Colombia, the government made policies to help research groups and technology centers work together with universities, which is a big part of their long-term plan to make Colombia a leader in innovation. By doing so, schools can help create new knowledge about the understanding of artificial intelligence and figure out how to use it in classrooms. This can help schools contribute to the development of AI and also find new ways to use it to help students learn.

Working together across labs and on campuses opens doors few expect. Universities teaming up with tech hubs find new paths through shared goals in science and progress. Rules drawn years back push schools to grow teams focused on invention, planting roots for future breakthroughs. These links let colleges shape how artificial intelligence grows, while testing real uses inside classrooms and studies. What happens in classrooms decides whether AI in education works. National plans matter, yet real change begins where teachers grow through support and hands-on experience. Progress shows up when schools prioritize experimentation instead of rigid rules. Meaningful tech use emerges not from top-down orders but from daily choices to adapt and reflect. A shift occurs once instruction focuses less on tools themselves and more on how they connect with learners. Success hides in small steps - adjusting lessons, sharing insights, trying again. The role of AI? Not replacement, just quiet help during moments of discovery. Learning gains depth when systems stop chasing trends and start listening closely. Results follow

where trust exists between educators and institutions. Change sticks when effort is steady, not loud.

CHAPTER VI: Conclusions

This concluding section brings together the most relevant findings of the analysis, showing how AI is currently understood and implemented within EFL teaching and learning in Colombia. What stands out when reviewing the documents is not that AI lacks space in Colombian EFL settings - though that seemed likely at first - but how irregular its footprint really is. Across all materials examined, AI is increasingly positioned as a meaningful pedagogical tool, particularly in terms of personalization, feedback, and student engagement. Similarly, AI-supported environments demonstrated their potential to strengthen language skills by offering adaptive learning experiences and immediate responses to learners' needs. Still, when considering this research initial goal, evidence indicates that AI appears embedded in scholarly work yet tends to show up in scattered teaching efforts instead of forming part of an established system. Despite this pattern, the presence lingers mostly on edges rather than cores.

However, the findings also suggest that there is a persistent gap between policy and practice with respect to the second objective. Although recent national initiatives with respect to AI have been growing in number, there are no clear pedagogical guidelines for the effective use of AI in English language teaching. Lack of access to devices and poor support structures have become, and continue to be, major obstacles to implementing AI in instructional settings. While progress has been made in terms of policy and initiatives, this has not been equally mirrored in classroom practice, at least in the Colombian context reviewed here.

A corresponding imbalance exists in regard to the third goal, as attention to AI in education is distributed irregularly across pedagogy, ethics, and technology. While there are

many studies which highlight the benefits of AI in the classroom, fewer actually investigate and challenge the ethical implications for student thinking, authorship, and academic integrity. Thus, while there is growing awareness about the importance of responsible use of AI, more work is needed to clarify corresponding boundaries. As a result, teachers are presented with a new set of challenges as they do not simply use technology but also seek to give proper consideration in pedagogy that is thoughtful and honest.

With all this context, it also can be stated that there is great potential for the integration of Artificial Intelligence into TEFL contexts in Colombia, as well as particular challenges and areas for improvement. Despite consensus in the research and instructional practices in AI-enhanced ELT, current teacher training and decision making around AI use remain in developing stages. Some ideas were evident in the research literature in terms of how AI use in ELT settings rarely translate to the practical realities found in teacher-based contexts, often resulting in technological interventions that are superficial and lacking in transformative potential. With this in mind, instead of treating AI as a separate or independent innovation, it should be seen as part of the wider process of educational innovation, interpreted and put into practice within the parameters of local needs. Consequently, this research finds that the use of AI in Colombian schools is uneven – sometimes present and sometimes absent – and generally lacking in direction. Yet students and future teachers are already starting to make use of these technologies without a full understanding of the opportunities and challenges they pose.

Although there is a growing institutional focus on using Artificial Intelligence in education as suggested in the policy documents, there still is a noticeable gap between what can be implemented in schools at the level of policy and what can actually be done due to structural constraints. To move forward we need a more concrete effort bridging institutional frameworks

and real-world classroom context and ensuring that AI is not merely seen as a technological breakthrough, but as a pedagogical tool capable of enabling a balanced and context-sensitive transformation of language teaching. In summary, this study shows that the adoption of AI in EFL education within the Colombian context is a developing and highly dynamic project.

Although it has been recognized pedagogically, its application is arbitrary and is influenced by different institutional, ethical, and socio-economic issues. Thus, progress in this domain demands not just technological adoption but also more critical, contextualized, and policy-oriented approaches to ensure that educational transformation is equitable and meaningful.

Implications:

What it is noticeable about this work it is a display of where English teaching with AI is currently at in different places across Colombia. It tracks the official rhetoric, the research-based possibilities, and the daily realities of AI in the classroom. Through the data it could be evidenced that AI in English teaching in Colombia is largely empty spaces and slow progress that reveals potential. This resource invites educators in Colombia to consider where English teaching with AI is heading, and to reflect on how this might be developing in their own contexts. Most importantly, it will hopefully prompt educators to think of more questions and consider new ways to tackle the current gaps and limitations.

In the same line, Technology does not have to be viewed as a neutral add-on to the classroom; instead, AI should be applied in ways that are relevant to classroom teaching and learning. As a result, future teachers should know not only how to use these tools, but when and why to use them: within what parameters and with what limitations for fairness, context, and consequences. The result could be that schools and programs will need to remake part of their

preparation of English teachers around these new digital skills as well as critical decisions and moral considerations.

For teacher training institutions this may seem a very obvious implication, however it means that teachers-in-training will have to experience these technologies in a different way to current users, not just learning how to use them but also learning how to critically evaluate their efficacy. In assignments for teaching practice, for example, students could be asked to explore the feedback given by an app like Duolingo or the processes involved in ELSA Speak, challenging simplistic notions about what is ‘correct’ speech and beginning to grapple with what is actually lost when a machine is used to correct pronunciation.

Limitations:

The limitations found during this research process are related to the conditions under which the document was developed rather than to the findings themselves. One of the main issues was the limited access to academic productions created by pre-service teachers. This situation restricted the scope of perspectives that could be included in the analysis. Likewise, although efforts were made to incorporate diverse and relevant sources, access to certain institutional repositories and unpublished materials was not always possible.

In the same line, it is important to acknowledge that the rapidly evolving nature of AI represents a limitation itself. This field is in constant change, creating new tools, policies, and pedagogical approaches that emerge in really short periods of time. This means that, despite trying to provide an updated and relevant overview, some of the information included in this research may quickly become outdated. Therefore, this research should be understood as a situated analysis that tried to capture a specific moment in the development of AI in TEFL

education, while also highlighting the need for continuous review and ongoing research in this area.

Further Research:

Thus, the results of this study provide a basis for investigation on several fronts, specifically the role of pre-service teachers and the learning processes link to the implementation of AI in EFL contexts in Colombia. Further research would see the teacher training programs adopting AI not only as a technical resource, but as a new mode of learning that helps future educators to construct their own notions of teaching, language development, and knowledge construction. Such a method will involve investigating pre-service teachers' approaches in engaging with AI, learning from the use of these resources, and how they impact their own learning and pedagogical choices.

Researchers could also address how educators facilitate digital education and development of critical literacy related to the use of AI tools in general (e.g., information evaluation, academic integrity, technology responsible usage). Ultimately, future research might consider longitudinal approaches to examine trajectories of growth in the use of AI across teachers as well as students. In doing so, this study opens the door to future research that will not only further the pedagogical incorporation of AI, but also further address the implications of the technology and its involvement in creating meaningful and context-dependent learning experiences in EFL education.

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Annexes

Annex 1 Rubric for the Selection and Analysis of Laws and Regulatory Documents

Criterion	Description	Scale (1-5)
Thematic Relevance and Alignment with the Research Objectives	The law must address aspects of AI, ICT, curriculum, foreign languages, teacher training, or educational quality.	1 = low relevance; 5 = highly relevant
Normative level and scope	Importance and legal weight of the regulation within the Colombian educational system.	
Currency and Post-Pandemic Pertinence	The extent to which the law reflects current digital, social, and educational transformations emerging after the COVID-19 pandemic.	
Conceptual and Pedagogical Contribution	The degree to which the law clarifies curricular, pedagogical or technological orientations.	

Annex 2 Rubric for the Selection and Analysis of Undergraduate Thesis and Action Research

Projects

Criterion	Description	Scale (1–5)
Thematic Relevance and Alignment with Research Objectives	The study addresses AI, educational technology, EFL/TEFL, ethics of AI, digital transformation, or related pedagogical issues.	1 = low relevance; 5 = highly relevant
Methodological Quality (Action Research Focus)	The project must follow an action research approach, including cycles of planning, acting, observing, and reflecting.	
Currency and Post-Pandemic Colombian Context	Degree of alignment with Colombia's educational reality and current technological transformations.	
Pedagogical Contribution	Quality of the discussion on how AI affects teaching, learning, ethics, and teacher responsibilities.	

Annex 3 Selected documents of Undergraduate Thesis and Action Research Projects for the Documentary Analysis

No.	Author(s)	Year	Type of Document	Institution / Source	Focus of the Study	AI Tool / Approach
1	Moreno Nago, M. E.	2025	Undergraduate Thesis	Universidad Nacional Abierta y a Distancia (UNAD)	Strengthening EFL learning through AI in university students	Artificial Intelligence tools
2	Vargas, M.	2025	Undergraduate Thesis	Universidad Pedagógica Nacional-IPN	AI to enhance English pronunciation	AI-based pronunciation tools
3	Gonzalez, C. D.	2024	Undergraduate Thesis	Pontificia Universidad Javeriana	Design principles for generative AI in language teaching	Generative AI
4	Gutierrez, N. J.	2024	Undergraduate Thesis	Pontificia Universidad Javeriana	Role of chatbots in EFL learning	Generative AI chatbots
5	Pardo, C. D.	2025	Undergraduate Thesis	Universidad Distrital Francisco José de Caldas	Analysis of English DBAs and curricular policies	Policy analysis (AI implications indirect)
6	Moreno Sánchez, N. V.	2025	Undergraduate Thesis	Universidad Nacional Abierta y a Distancia (UNAD)	AI-enhanced strategies for adult speaking skills	AI-enhanced learning tools
7	Fonseca Gutiérrez, A. C.	2021	Undergraduate Thesis	Universidad Distrital Francisco José de Caldas	Chatbot-mediated self-regulation and communicative competence	Chatbot
8	Arguello Toloza et al.	2025	Undergraduate Thesis	Universidad La Gran Colombia	Incidences of AI use in Modern Languages program	Artificial Intelligence tools
9	Moreno Salazar et al.	2025	Research Project	Universidad EAN	Innovative English learning strategies in adults	AI-based virtual strategies
10	Sánchez Perdomo, J. L.	2025	Master's Thesis	Universidad Nacional Abierta y a Distancia (UNAD)	ChatGPT and British Council platform in SENA apprentices	ChatGPT
11	Jiménez Medina et al.	2024	Master's Thesis	Universidad EAN	AI-based virtual platforms in secondary education	AI-based virtual platforms
12	Pérez-Montero & Hernández-Henríquez	2025	Journal Article	Cultura Educación y Sociedad	ChatGPT to improve research proposals	ChatGPT
13	Valdés Mendoza, N. Y.	2025	Undergraduate Thesis	Undergraduate Thesis	Integration of AI in English teaching	Artificial Intelligence tools
14	Incorporating ChatGPT (Collective authorship)	2024	Journal Article	Senderos Pedagógicos	Ethical and pedagogical implications of ChatGPT	ChatGPT

Annex 4 Selected Policy and Regulatory Documents for the Documentary Analysis

No	Policy Document	Year	Type of Policy Instrument	Issuing Authority	Scope and Main Focus	Relevance to AI Integration in EFL
15	CONPES 4144: National Artificial Intelligence Policy	2025	National AI Policy (CONPES)	National Planning Department (DNP)	Establishes governance mechanisms, ethical principles, infrastructure strengthening, and AI talent development	Provides national AI framework; implications for digital skills development and educational integration
16	Law 2108 of 2021: Internet as an Essential and Universal Public Service	2021	National Law	Congress of Colombia	Recognizes internet access as an essential public service	Addresses connectivity gaps affecting AI implementation in EFL classrooms
17	National Digital Strategy 2023–2026	2023	National Strategic Framework	National Planning Department (DNP)	Digital transformation strategy including infrastructure, innovation, and digital governance	Supports technological ecosystem necessary for AI-based educational practices
18	CONPES 4144: Colombia's Roadmap in Artificial Intelligence for Current Challenges and Future Transformation	2025	AI Strategic Roadmap	National Planning Department (DNP)	Defines AI implementation priorities, ethical considerations, and sectoral applications	Frames AI expansion; indirect implications for educational and language learning contexts
19	Ethical Framework for Artificial Intelligence in Colombia (Version 1)	2021	Ethical Guideline Document	Presidency of the Republic of Colombia	Establishes ethical principles for AI development and use	Relevant for ethical AI use in EFL teaching and academic integrity
20	Ten-Year Education Plan 2016–2026	2017	National Education Policy	Ministry of National Education (MEN)	Long-term educational development plan	Demonstrates limited explicit integration of AI in language education policy
21	Law 1286 of 2009 (Science, Technology and Innovation Law)	2009	National Law	Congress of Colombia	Strengthens National System of Science, Technology and Innovation	Provides structural basis for AI development and research ecosystems
22	CONPES 3975: National Policy for Digital Transformation and Artificial Intelligence	2019	National Policy (CONPES)	National Planning Department (DNP)	Promotes digital transformation and AI adoption across sectors	Precedent policy influencing AI integration in educational settings