

**ARTIFICIAL INTELLIGENCE: INCIDENCES OF ITS USE IN THE MODERN
LANGUAGES PROGRAM AT UNIVERSIDAD LA GRAN COLOMBIA**

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Abstract

In the modern era, technological advances are becoming more and more innovative and important for humanity. Because of this, the world is facing different challenges, in this research those challenges are for educational context. The popularity of AI (artificial intelligence) has made it become famous in any field, in education it became a useful tool for both students and teachers. This study focuses on the pre-service teachers in the Modern Languages Degree of the Universidad La Gran Colombia and the incidences that are generated when they use artificial intelligences in their second language classes or in other classes in general in the degree. The following is an exploratory study with a qualitative approach., which, likewise, it is expected that the results are clear and have the necessary information to demonstrate whether these incidences are positive or negative and how they may be affecting pre-service teachers, probably offering some conclusions and recommendations promoting a better use of artificial intelligences in pre-service teacher in educational fields and university education.

Keywords: Artificial intelligence, critical thinking, learning, second language.

Resumen

En la era moderna, los avances tecnológicos se convierten cada vez más en algo innovador e importante para la humanidad. Dado a esto, el mundo enfrenta diferentes retos, en esta investigación esos retos son para el contexto educativo. La popularidad de la IA (inteligencia artificial) ha hecho que esta se vuelva famosa en cualquier ámbito, en la educación se convirtió en una herramienta útil tanto para los estudiantes como los profesores. Este estudio se enfoca en los docentes en formación en la facultad de Lenguas Modernas de la Universidad La Gran Colombia y en las incidencias que se generan al ellos usar las inteligencias artificiales en sus clases de segunda lengua o en otras clases en general de la facultad. El siguiente es un estudio exploratorio con un

enfoque cualitativo, que, así mismo, se espera que los resultados sean claros y tengan la información necesaria para demostrar si esas incidencias son positivas o negativas y en que pueden estar afectando a los docentes en formación, probablemente ofreciendo unas conclusiones y recomendaciones promoviendo un mejor uso a las inteligencias artificiales en los profesores en formación en campos educativos y educación universitaria.

Palabras clave: Inteligencia artificial, pensamiento crítico, aprendizaje, segunda lengua.

CHAPTER I: Introduction

In the context of globalization, technological advances and the transformation that AI (Artificial Intelligence) has had impacting different areas including education. This study is focused on analyzing the incidences that are occurring in the learning processes of pre-service teachers of the Degree in Modern Languages at Universidad La Gran Colombia (UGC), in relation to the use of AI in the development of their academic processes. The question that guides this research arises from the contradictions found between the testimonies of the professors of the program and pre-service teachers of the same. The main purpose of this research is to analyse what are in fact the incidences that are being provided in the development of activities of the pre-service teachers and the real reasons that derive them.

This research adopts an exploratory-qualitative approach allowing the researchers to understand and classify the perceptions, actions and experiences of pre-service teachers in relation to the use of AI. Data collection was done via interviews and surveys applied to them, and the qualification of this information through a triangulation in which a matrix and a comparative chart were made, these instruments allowed the identification of constant patterns and important findings for the research.

Finally, the theoretical framework of this research is structured by three (3) fundamental concepts, AI, Critical Thinking and Learning, these concepts allow to base and contextualize the use of AI both as a support tool and as an enhancer and limiter in the development of different key skills for future teachers, it is important to clarify that this research is based on the degree in Modern Languages and the subjects that cover it. For this reason, this research contributes to the constant debate that is generated by the use of AI in the professional training of pre-service teachers with

the objective of identifying benefits, limitations and proposals, within the institutional context of the UGC.

Justification

The purpose of this project is to know why there are different perceptions about the use that pre-service teachers of the Modern Languages degree at the Universidad La Gran Colombia give to artificial intelligence. First of all, it is important to emphasize that this project is based on pre-service teachers, who are the students of the faculty of Modern Languages of the university who are studying to become teachers, however, this work is not focused only on the field of English or second language learning, this is based on the degree in Modern Languages and all the subjects that cover it. With this in mind, perceptions are divided, on the one hand, teachers name all the problems that AI is bringing to the classrooms, generating that pre-service teachers do not do things by themselves, on the contrary, they become dependent on using it often, affecting their learning process. On the other hand, pre-service teachers have other perspectives on artificial intelligence, naming all the qualities it has and all the benefits it generates, demonstrating why they are using this tool.

Maximiano & Guimaraes (2024) state that AI has had several advances that have been positively affecting education, the administrative process, teaching and learning, and minimizing critical thinking in learners at different levels. This is partly coupled with teachers' opinions, thus showing a problem occurring in pre-service teachers of various semesters. The affectation of critical thinking, autonomy, and improvement of English skills when using AI to solve problems or activities left in class is one of the main problems affecting pre-service teachers as these are not being used correctly. AI is such a powerful tool that can foster the development of critical thinking from a transdisciplinary perspective. However, it is necessary to ensure the ethical use of AI by

minimizing risks and maximizing benefits, here it is essential to emphasize the correct use of AI because it is one of the biggest drawbacks that teachers see when pre-service teachers use these tools, applying ethics in these activities is feasible because it will benefit both parties, in one respect, pre-service teachers will not cheat, making the learning process is not affected and in turn can allow teachers to use or apply these tools in their classes.

Based on Mosqueda (2024), interaction with these AIs allows students to critically analyze information, question and verify its accuracy. Fostering the ability to detect errors or fallacies in the information, improving the quality of learning. If these tools are well applied and indirectly start talking to pre-service teachers about how to use them, the issues of pre-service teachers doing homework just to get out of it without understanding or paying attention could be less, by starting to use these tools more often, the student could expand their knowledge and apply that critical thinking, helping them to improve their learning.

Problem Statement

In recent years, the fourth industrial revolution has been the topic of conversation, which also refers to a digital revolution. That is, tools such as artificial intelligence has become a powerful opportunity for the development of processes in different fields or contexts, which implies that at the same time, changes can be generated in the way of interacting, working, teaching, or learning, Fourth Industrial Revolution (2023). AI offers significant changes in educational processes, simultaneously, some questions may arise about the impacts that these changes may generate since currently it is possible to see a constant need in terms of technological updating. A study conducted by UNESCO (United Nations Educational, Scientific and Cultural Organization) (2021), points out that a link must be created between technology developers and educators in order to generate

relationships with AI, relationships that are ethical and inclusive for the progress of all students and educators.

For this reason, the problems that focus this research are the incidents that may be occurring in pre-service teachers when using AI for the development of their academic activities, specifically in pre-service teachers of the degree in Modern Languages at Universidad La Gran Colombia. According to the new educational proposals provided by Dewey's New School (2001) and the insertion of different technologies, there is evidence of an effort made by teachers and students to adapt to new technologies.

Researchers have conducted different interviews (Annex 2), evidencing throughout the career how pre-service teachers with degrees in Modern Languages present some gaps in their understanding and application of AI in the development of their academic activities. According to UNESCO (2021), the use of AI in education can revolutionize learning experiences and methodologies. Considering that pre-service teachers use AI mainly for translations, basic tasks or obtaining information. Based on a study by the OECD (Organization for Economic Co-operation and Development) (2019), that is, one of the incidences that could occur in pre-service teachers of Modern Languages is to give a vision to AI that is more technical and less pedagogical, for this reason, could be affected by the human factor, critical thinking, skills development, or even innovation in applied pedagogy.

Luckin (2017) mentions that it is fundamental that pre-service teachers have critical engagement with AI tools to maximize their benefit, in the same way, to avoid or counteract the risks that a misapplication of AI can cause, such as dependency or ethical incidences. This research highlights that pre-service teachers should be equipped with knowledge about AI, according to Zhai et al. (2021), they point out that pre-service teachers' use of AI is linked to their prior

knowledge. On the other hand, teachers of the Modern Languages degree indicate that pre-service teachers do not generate adequate prompts at the time of consultation in the AI, likewise, pre-service teachers take that information that may be erroneous to perform their academic activities, whether they are writings, reviews, dialogues, among others (Annex 2). This can generate stagnation in the development and transformation of skills, one of them is critical thinking, since the information generated by the AI is not being duly transformed, that is, pre-service teachers are not appropriating that information and perhaps giving it their personal stamp.

Likewise, Diaz & Nussbaum (2024), point out something called “pedagogical intelligence”, which refers to using AI effectively, this is how the research is also based on, what is the main objective for pre-service teachers to use AI, for what academic activities, why in some moments errors are evidenced in its use.

Understanding the above, during the development of academic activities in the periods of study and taking into account that the era of AI in recent years has taken great prominence around the world Rivero & Beltran (2024), promoting the use of AI in the educational environment could allow students to personalize their learning and help in their process of developing skills autonomously, since autonomy allows pre-service teachers to participate in their learning, allowing them to generate corrections regarding the use of AI in their academic environment, Flores & Garcia (2023).

Therefore, the following research question arises from the findings on how Modern Language pre-service teachers use AI (Annex 6), the categorization of possible incidents that may be present, and the description of these incidences, *what are the incidences of the use of AI into the learning process of pre-service teachers from the bachelor in Modern Languages at the UGC?*

That is to say, pre-services teachers are not giving a technical use to AI which leads to limitations and repercussions in their critical thinking, pedagogical application and training in the use of AI, for this reason different personal interviews, “among other instruments....” were conducted with professors of the Modern Languages Program to obtain a vision and perception of this use of AI today by these pre-service teachers.

Objectives**General Objective**

To analyze the incidences of the use of AI into the learning process of pre-service teachers from the bachelor in Modern Languages at UGC.

Specific Objective

1.To identify how pre-service teachers are using the AI in their learning process into their bachelor degree.

2.To categorize the information related to how pre-service teachers are implementing the AI in their learning process.

3.To describe the incidences of the use of AI in pre-service teachers from the bachelor in Modern Languages at the UGC.

Literature Review

In the age of technology many artificial intelligences have emerged to help people perform tasks and make it easier for them to obtain information. Today, artificial intelligence has transformed the field of education by directly influencing students and their learning process.

According to the aforementioned, this literature review describes different investigations that have been worked as a support for the understanding of this study. Different practices and approaches of the use of artificial intelligence in education will be analyzed.

National

Through diverse analysis of research and studies at the national level, it is key for researchers to understand how artificial intelligence is used, adapted and executed in the Colombian educational field taking into account perceptions of teachers and students, which relates to the involvement of AI in the learning-teaching process. This overview provides strong bases to guide this project focused on the use of artificial intelligence in the modern languages program of the UGC, highlighting its importance and reinforcement of the theoretical concepts to be worked on in this investigation

Tafur & Molina (2023) explored the incidences of technologies that integrate Artificial Intelligence in education. This study is descriptive and non-experimental based on bibliometric methods generating an analytical review of scientific production, emphasizing the exploration of artificial intelligence titles in education. From investigations in the Scopus database some results are obtained, applying Artificial Intelligence in education is a good opportunity to update the educational system, at the same time students and teachers have the role of adapting themselves to this significant tool and facing the challenges in order to take advantage of the benefits of the AI and potentiate the teaching-learning process.

The integration of Artificial Intelligence in the English language based on the teaching-learning process of students and teachers in Colombia. The methodology of this study was exploratory based on content analysis, making different foundations for the study, the first in defining objectives and research questions, the second the collection and preparation of data on artificial intelligence in the teaching-learning process of English language in undergraduate and graduate programs and finally the information collected was classified. The findings revealed in the work put AI as a support tool for the design of materials, new strategies based on the evaluation and learning process, however there is the concept of maintaining the improvement to understand more about AI tools, the qualification of teachers to develop a good quality education hand in hand with the government, Díaz & Díaz (2024).

The impact of AI in higher education, specifically in Colombian universities. Some results were obtained through mixed descriptive-reflective research, focusing on the incidence of artificial intelligence in the field of education. The information is supported by databases applying documental analysis at national, international and local level, as for the primary source, a survey was made related to the AI to the staff of the Institución Universitaria Americana. In this way, thanks to the perceptions of the educational community, teachers and students, it was found the positive use of artificial intelligence to improve the educational field and its possible potential for adaptation to maximize learning processes, being the constant training of these technological tools an essential element for its effective use, De la Cruz et al (2024).

According to the authors, Sanabria et al (2023) analyzed the incidences of artificial intelligence in contemporary education. The study reveals the implications of the inadequate use of artificial intelligence in today's education, which can generate gaps in learning, development of competences and even critical posture in students. Concurrently, through a methodology called

“prism” (Scopus, Mendeley and Science Direct) hand in hand with mixed methods, a descriptive bibliometric analysis and from a constructivist perspective to reference articles based on proven realities. They find the results in which students have an important role when using AI, but teachers are also essential when implementing artificial intelligence in their methodologies and how they promote its use.

International

The following international studies focus on the relationship between artificial intelligence and education from different perspectives and contexts, which also relate the artificial tools as essential components to improve the knowledge of a language in a current education and that advances over time. The researchers understand what are the positive and negative implications of implementing artificial intelligence, which influences the development of academic activities and the different skills that the pre-service teacher acquires and develops. This provides a wide perspective on the effects of the use of artificial intelligence in education, which provides an important basis for this research conducted in the modern language program at UGC.

A study about systematic review on the use of artificial intelligence as a tool in second language teaching in higher education. The methodology used is the Prism which was applied to collect data on how artificial intelligence is implemented in the learning process, in the same way a mixed method with quantitative approaches was used to obtain numerical results. Four questions are proposed to collect information focused on the 4 skills (writing, speaking, listening and writing), then when the information is obtained, they found that teachers need to have constant training on AI to be able to implement it in the teaching of a foreign language and thus be able to develop the different skills of students and take advantage of it, Bravo et al (2024).

The main objective of the research by Slavov et al (2023) is to present how students perceive the role of artificial intelligence and its potential in education. This investigation was carried out thanks to a survey with 12 questions, in which information and various data were obtained from high school students, moreover to obtain effective findings such factors as age, gender and type of school were taken into account. The results show that high school students are capable of using AI, being clear about its purpose to enhance learning, however they are not aware of the ethical use of AI in education and this influences their attitude and therefore also affects their learning process.

The investigation explores and reflects on the potential use of Artificial Intelligence when learning a language. Furthermore, using an exploratory methodology, also a qualitative and descriptive approach, the purpose of this work is to see the impact of AI in language education and to explain the different tools that have emerged from AI, digital resources such as online dictionaries and the benefits when these are used by students.. The study concludes with the development of different tools or applications related to AI to improve the teaching-learning process, while adapting to the learning needs of students and potentiating teachers' methodologies, Hernández (2021).

The author Svoboda (2024) mentioned the importance of AI in the teaching and learning process. This research has a descriptive approach to the pros and cons of the use of AI, and how it can be applied in the teaching process showing different uses such as the use of graphics, educational materials edition, interactive lessons, etc. On the other hand, mentioned the cons, and those cons affect many of the students. If students use AI incorrectly, over time, it will affect their creativity and critical thinking, increasing their dependence on AI. In addition, a data collection instrument such as a survey was used, likewise using descriptive statistics. Thanks to different

interpretations, some answers were obtained about how important and useful AI is, however, it is important to know how to implement it in an educational environment by teachers, these results will be used to optimize the concept of educational curriculum within the new educational system.

The purpose of this investigation is to understand the role of Artificial Intelligence in English language teaching and at the same time to investigate it within the educational environment. This work is based on Library research, with a focus on information collection and different reference books and journals are examined. The results show many benefits of using Artificial Intelligence with students, Fitria (2021). It offers personalized learning based on the needs of the students and relates their interest, reinforces their skills such as speaking and writing, thus being an easy way to learn.

Local

Within the local scenario the below investigations provide positive perspectives on the integration of artificial intelligence and help us as researchers to identify which of these are found in the modern language program at the UGC. The studies examined are important to know also the challenges that may exist and affect the pre-service teachers' learning.

The main objective of the research is to know which are the challenges and benefits of the use of AI. A qualitative method to investigate and understand the subject of AI in higher education was used, also implementing a hermeneutic phenomenology approach, which is based on the study of life experiences and from the individual's perspective. Some of them were about the positive effect which AI has in the teaching and learning process, also there were a question about implement different kind of assignments which help the students to use correctly the AI, most of the students wanted to apply it in the university, finally there was another important question, it was about the improvement of the learning process in the students thanks to the AI, most of them

did not agree or disagree with that affirmation, the researchers mentioned that is sooner to know the complete impact of AI in the education, however, they affirm that it could have a directly effect on the the educational system, Bedoya et al (2024).

The research of Quijano (2024) is based on the development of an evaluation model designed to measure the impact of AIs in higher education, specifically those that generate texts or AI-based text generative tools. The methodology used was the quantitative method with a positivist approach, thus a survey-based sampling was performed to explore various impact models, as well as the use of programs such as Scopus to analyze various types of questionnaires. The result was the effective creation of the model to evaluate the impact of AI tools, offering a complete view of the use of AI and taking into account the perceptions and experiences of students. Also, with the creation of this model, teachers will be able to evaluate the impact of the integration of AI and text generation programs in their practices, making AI-based text generation tools important elements in the learning and teaching process.

Theoretical framework

Artificial Intelligence

AI is a key element that is taking place nowadays, although it is not something totally new, it is known that it has gained a lot of strength in the last years, being recognized and famous, besides being used in different fields. To start talking about AI, first of all it is necessary to know or take into account what it is, according to Vanzeto & Rodriguez (n.d.) AI could be defined as a synapse of algorithms, data and Big data, highlighting the ability to process and understand different types of information, besides that this was based on the human body, especially in the human mind, thus being one of the most useful tools that there is today giving that impact on society. The fact that it

chooses to be an intelligent behavior and very similar to that of a human being, is something totally new for people, perhaps creating controversy but also opening the way to a totally different future.

On the other hand, according to Rouhiainen (2018), he defines artificial intelligences as machines capable of using algorithms, learning different types of data and having the ability to apply all that information like humans, however, unlike humans, doing all that instantaneously. Instantaneity has become something crucial today, something necessary for people. If a machine, or an artificial intelligence is capable of that today, what more uses could be given to it, or in the future what will be its function. The important thing is to take advantage of it, especially in the educational field, since these could become crucial for everyone.

With this it could say that this type of intelligences, which in recent years have been increasingly famous, are a representation of the human mind, but arguably improved, intelligences that are able to do what any mind can but faster, with an incredible ability to absorb all the information that is on the internet and the ability to learn more and more of everything. With all this, it becomes a tool of the modern era capable of everything, being viable for any necessary matter and a great help to people today, and talking about education, with an incredible affinity to be implemented in this and help in all the educational field.

History of the IA

Artificial intelligence has been making an immense impact on society for many years. This is not something that has been created recently; on the contrary, it is an idea and a theory that has been developing over the years.

As mentioned by Buchanan (2005), artificial intelligence has been evolving from its roots in philosophy, fiction, and the first inventions in terms of mechanics, until today, which has been consolidated as a field of study of this new era. In terms of philosophy, it is mentioned that René

Descartes and Leibniz were among the first to reflect on the possibilities of creating intelligent machines for the exploration of the human mind, of thought.

Following what Buchanan (2005) mentioned, as time went on, in the 17th and 18th centuries, mechanical automatons were built, clockwork devices for example, these were key in inspiring ideas about the concept of automation, however, it was a difficult task, in those years the fear of mechanical behavior was remarkable, however it was achieved that it was possible and should not be feared. Gradually progress was made, and mechanical engineering gained momentum, but intelligent control was still in theory. Thanks to scientific advances in the twentieth century, this technology began its process, in the years 1940-1950 the computer had already been created years before and these new functions that had, they were called digital brains for their great capacity for calculation. Alan Turing was primordial in this process, he published an article in 1950 where he determined if a machine could show an intelligent behavior or not, he called it “Turing's Test”. In 1956 a great event happened, at the Dartmouth conference, the official naming of AI as an academic discipline was given, in this same conference, the term artificial intelligence was stamped on it. In those years, programs capable of solving mathematical logic problems began to be developed and shown, one of them was called Logi Theorist by Newell. The 1960s saw the development of digital programs and systems. New programs emerged whose functionality was to replicate human cognitive processes, among them were problem-solving and learning. Continuing with the 1960s and 1970s important systems emerged, some of these systems were called DENDRAL and MYCIN, these showed that small information or knowledge bases could solve problems of something specific, for example, areas such as medicine or mathematics.

To give completion to the contextualization of the story, about the present, according to Rai (2024) comments that there was a winter time for artificial intelligence in the year 1987, this due

to the lack of advances that could really matter and imply a great development. Since the year 2000 different types of advances were seen, however there was not one that really took a breakthrough further for artificial intelligences, however, in 2020 OpenAI launches GPT-3, which is a fully advanced language model, making that by 2021 this became the first language models, this revolutionized the natural language processing, thus signifying a new path for companies to start designing all kinds of artificial intelligences as it is possible to see today.

AI in Education

After having detailed the history of artificial intelligence, in which it is evident that it is not something sudden or famous, but that this comes from the theory for a long time, and what is seen today is not even its final phase, this technology will not stop advancing and learning, in fact, for that is, it is a source of infinite learning. In education this stands out, the power of learning and information that these systems and programs can provide is massive, allowing the student to obtain information in a matter of seconds and in turn, learn from it. Not only benefits the student, but the teacher as well, so many digital tools that can help in the development of classes today is something very famous.

According to Chen (2020), AI has been adapted in various areas of the education sector, there are three topics in particular, these are administration, instruction and learning. In administration AI has been involved in improving and facilitating tasks such as reviewing or grading student work, in instruction these tools allow the customization of content in classrooms, thus being able to adapt them to the needs of students, and learning, tools such as Canvas, Moodle with AI are key to the development of classes today, but about corrections, or feedback, Turnitin with AI is totally important because it is the main to detect that students are correctly applying

what they have learned and not get carried away by doing absolutely everything with AI. You can see how AI facilitates learning and improves the student experience in terms of education.

Following what Chen (2020), said, intelligent technologies in education are key because they help to advance in the classroom, one of them are intelligent education systems, these help to give personalized feedback to the student, designed to improve the value and efficiency of learning through different tools, helping autonomous learning. There are some very famous tools, chatbots, these artificial intelligences such as ChatGPT, Gemini, Copilot, Socratit, etc, are very important when applying autonomous learning, students can use these tools facilitating the search processes and providing them with everything instantly, however, this can affect both positively and negatively to students. AI education models are also other smart technologies, helping to build data maps, artificial intelligences that enhance learning, language practice, helping to generate content for classes as needed. As mentioned above, all these tools were designed to enhance the learning experience, helping students and facilitating teachers.

According to Numa-Sanjuán et al (2024) the integration of AI in education is a complete breakthrough, improving educational processes, improving student autonomy and also emphasizes the importance of education not only to students, but also to teachers. A combination of traditional education and virtual education with the help of these new tools is the future with which educational demands will be met.

All this information is key both for the development of this degree work, as for the university, if it begins to implement more often this combination of education, traditional and virtual, students will have a fresh and dynamic learning, plus it will also be a help for teachers who may want to implement something else in the classroom. This concept of artificial intelligence is extremely important in this research, besides the fact that it is the most important topic that is being

worked on, it is evident all the aids, facilities, conveniences, etc, that it gives at the time of teaching the student and likewise, that the student can generate an autonomous learning improving his experience and facilitating his process in the university, clearly the ethical aspect of knowing how to use these technologies is crucial and important, that is why all these issues are worked to generate confidence in teachers, to begin the implementation of these AI without the fear that students only use it to get out of the tasks left, and likewise, for students to stimulate the learning process and take advantage of new technologies that exist today.

Critical thinking

Critical thinking has been one of the most important skills for reasoning and learning of human beings. That is why this concept is essential to address for its relevance over time and how it has become important again due to the use of artificial intelligence and how it affects this skill focusing on the educational field. In this way, it is fundamental to know the different definitions that can help to understand the meaning of the concept to critical thinking to have a broader and better perspective on the term.

According to Paul & Elder (2003) is a manner of assuming about a topic or problem, in which the person improves his thinking process through structures related to intellectual thought and submits them to mental exercises. This author exposed different characteristics that a critical thinker should have, which are:

Analyzes problems and formulates questions

Evaluates relevant information and uses ideas to interpret that information effectively.

Arrives at appropriate conclusions and solutions.

Examine scenarios and their possible variables with consideration of consequences.

Seeks solutions to complex problems and communicates effectively.

On the other hand, Morales (2014) mentioned that the concept of critical thinking is closely related to the act of questioning and valuing, being these two essential elements to make a judgment, take a determined position, or a final decision.

Based on the above definitions, it is possible to show that critical thinking is crucial to acquire information, inquire about it and obtain adequate conclusions and decisions, as well as forming new ideas and mental structures. These actions and activities have been affected with the advent of artificial intelligence in education, thus influencing the cognitive and autonomous process, which harms both the dynamics of students and teachers. This is why this aspect will be addressed in this project by focusing on higher or university education.

Critical thinking from an educational perspective

Within the educational system, the teachers and students have specific roles. The most common is to know that the teacher must teach about a certain topic and that the student's goal is to learn. However, nowadays different scenarios have arisen in which it is necessary to promote critical thinking in both areas, that is, the implementation of the student through their skills and on the other hand as the teacher creates their classes, teaching materials that encourage the use of critical thinking in their students in the classroom and outdoors. According to the text by Nor & Sihes (2021) it is essential that the teacher's first objective is to achieve the improvement of critical thinking and seek strategies or methods for its application. From the above, the student will become a critical thinker depending on the task and the way of analyzing and solving it. This implies that critical thinking has a fundamental progress in a student's educational process and in their life, nevertheless, when there is no awareness of what is being learned or how cognitive development and skills work, it does not guarantee effective learning. In a study by Enciso et al (2017) it is mentioned that different companies have been surveyed and found that candidates cannot think

creatively, critically, work together or organize themselves to perform tasks. The aforementioned signifies that education is of utmost importance to make a student a good thinker, not only in a critical way but also in other areas, thus helping them to be prepared to face responsibilities, challenges, etc., so that they can be successful.

Thus, the purpose of the educational system is not to teach students a lot of knowledge, but to teach them how to learn. In relation to the above, how critical thinking skills are enhanced influences many future capabilities of the student and therefore how they cope with a labor field, being fit for its demands. Consequently, it is necessary to create classroom environments in schools or universities where students can actively participate in their learning process by implementing their cognitive and thinking skills such as questioning and problem-solving, which are the most common situations that students face in daily life. In contrast, it is important to guide students through activities where they can inquire, investigate, or explore because these elements are a key part of the teaching-learning process.

In a study by Thornhill-Miller et al (2023) is considered in the same manner three main axes of critical thinking in students, which are critical thinking about the world, own critical thinking or self-reflection and finally in decision making, these three aspects are part of the great concept worked on. By this way, critical thinking is very important in education and life since it allows students to learn consciously and efficiently, solve real-life challenges, think constructively and creatively. It is also essential to put it into practice so that the student becomes a good professional, taking into account the recent graduates or pre-service teachers on whom this project is based.

Critical thinking and Artificial intelligence

Artificial intelligence has transformed the field of education becoming a support and search tool in which you can find all kinds of information quickly and easily. Likewise, since it is so new, students have chosen to use it frequently and this has caused it to be compromised in the critical thinking of students. Nevertheless, according to Hao et al (2024) should not discard the existence of the multiple advantages of using artificial intelligence, such as access to large information bases, personalization of learning, and automatic generation of feedback. In addition to the above, in accordance with Walter (2024) artificial intelligence offers to build individualized content and likewise an enhanced learning experience, taking into account the preferences, strengths, weaknesses and even specific needs of each student so that their process can be meaningful and enriching, not to mention more accessible and inclusive for them. In this way, AI is a vital tool in modern education because of its multiple advantages that facilitate learning and the achievement of skills such as critical thinking, which is fundamental for the acquisition of knowledge and how it is reflected or applied in their lives, both in educational aspects and in general aspects of their daily activities. Alternatively, according to a study by Walter (2024), when AI is used or adapted by teachers, an educationally more effective and empowered atmosphere is usually generated by the use of it. This means that students in the classroom feel more active in their learning, exploring new tools, trying out their information search skills, adapting it, also fostering their creativity among many other positive aspects for the improvement of their understanding and acquisition of information.

Similarly, it is important to be conscious of what artificial intelligence provides, because although its use brings many benefits, it can also have disadvantages for the student when the information is not processed and internalized correctly, for example when the student only makes

a copy page, his cognitive system is not analyzing the information provided by the AI, which affects his learning process and also impacts critical thinking. There are also other conditions that affect or have a negative impact on students, as stated by Walter (2024) when they use AI incorrectly such as unawareness of its use and even its level of danger by providing information that may not be real or truthful. In addition, students use AI to minimize effort and therefore do not care about learning, and in the similar way students give all their doubts to the AI and do not take the required time to study the data. Furthermore, to inquire in different sources, which reduces the level of investigation and adaptation, that in the long term has repercussions in their critical thinking and decision making. In this way, the implementation of AI into education represents both opportunities and challenges for the development of critical thinking skills, Hao et al (2024).

Apart from what has been mentioned, it is not because there are considerable disadvantages that the good and beneficial that the use of artificial intelligence brings will be discarded. The author Walter (2024) mentions in his study that many schools prohibit the use of AI because students do not know how to use the different tools that exist, either due to excessive use or simply they stop thinking for themselves. However, the world is constantly changing and it is clear that AI is evolving, so it is necessary that students also evolve at the rhythm of AI, that they learn how to use it correctly and in support of their learning process, since a good use can favor their cognitive skills, including critical thinking. In this part the teacher also plays a fundamental role in promoting these tools and creating awareness of the possible consequences and limitations that excessive use can have.

The concept of critical thinking is indispensable in this research since it is a very relevant component in cognitive and knowledge development, therefore it is crucial to see how it has been affected by the implementation of new technologies and artificial intelligences focusing on

university education. This can directly affect the learning process of pre-service teachers, so it has been decided to study it in depth to have a broader field and understand the circumstances under which it is affected.

The concept of learning

Is one of the key terms in education since it is considered an active process where individuals construct or acquire knowledge either by interaction, assimilation, or adaptation, Piaget (1950). In addition, learning is a fundamental aspect of human nature because humans are highly skilled in two key areas: survival and acquiring knowledge, that is to say the capacity to learn has granted humanity an unparalleled level of flexibility and adaptability, surpassing that of any other species on the planet (Ormrod, 2008).

The learning of a second language is a process where individuals acquire and develop linguistic skills, related to a language different from that of their native environment, in order to be able to communicate in social or academic environments. Based on Ellis (2008), acquiring a new language implies an interaction, but also an explicit teaching where the different grammatical rules of this new language are learned. On the other hand, Vygotsky (1978) also exposes the importance of the social context and the interaction that must be more noticeable in comparison to the one had with the native language for better learning.

For this reason, integrating AI in a learning process can be of great help, as it serves as an interactive and personalized tool, to have feedback according to their processes, while achieving a more instantaneous practice and adaptation of material according to the needs of the pre-service teachers both for learning and adaptation.

Learning in the AI era

Over time, AI has revolutionized education and therefore also learning, since AI provides tools that facilitate and optimize learning, in addition to the impact it has generated in pre-service teachers today. According to Ordoñez García et al, (2023), the implementation of AI in pre-service teachers works as an assistant for the development of different activities such as the creation of material, request for information or support in grading, however it is important to keep in mind that AI should always be seen as an aid but not as a replacement. This is why Rentería García, (2023), highlights that although AI has a great potential in terms of learning for pre-service teachers, it can also generate certain concerns regarding the loss of critical skills based on the fact that it does not always have adequate ethical and technical training, which could affect the student-teacher relationship, since pre-service teachers may prefer AI as their primary aid, leaving aside human contact, which is considered a mistake since the theories mentioned above show that the basis of learning is also derived from the contact with other human beings.

In this digital era, it is considered paramount to generate a safe environment based on supervision as it is important to set limits on the use of AI, in this case focusing on pre-service teachers should be taken into account that although AI streamlines and supports the processes and educational activities and know how to use the information for our benefit without neglecting the own ideas that should generate pre-service teachers, TIC are the impetus and have taken a greater importance in education with more demanding methods where the main protagonist is AI, Huerta & Zavala, (2023).

This concept is indispensable in this research, because it is important to emphasize learning as a fundamental process in the development of human beings, where individual

characteristics and needs are evidenced, AI is outlined as a tool of great impact to serve pre-service teachers and promote a personalized and effective education.

CHAPTER II: Methodology and Instruments

Methodology

In the context of learning in the Modern Languages degree program at Universidad La Gran Colombia, the use of artificial intelligences has been worrying teachers during the last years, generating in them this concern about why pre-service teachers use them so frequently and also, having this intrigue if it will be good for pre-service teachers or not to use them in their learning process. Through the qualitative approach, this research is focused on pre-service teachers, it aims to give a voice to these pre-service teachers, allowing them to speak and make known what they think about the use of artificial intelligences and demonstrating why they use them. This study uses exploratory research in order to know the voices of both sides, both professors and pre-service teachers. With this, it will be important to know why artificial intelligences are being used so much and if pre-service teachers believe that they are using them correctly or not. Prioritizing the pre-service teachers, but not leaving behind the professors, this research tries to adopt both points of view, attempting to find the answer to the great problem. In this second chapter, the researchers will explain step by step the methodology they used to obtain the results throughout this research process, thanks to the surveys and group interviews of the survey respondents, who were the pre-service teachers of the degree about this current problem with the use of these new technologies, the artificial intelligences.

Qualitative Approach

This research study was approached with a qualitative approach based on the inquiry of a social problem through which different interpretations are developed to understand the meaning of the phenomena, based on the corresponding theories, Creswell (2013,p.44). This is how the perspectives of pre-service teachers are taken into account, which at the same time are analyzed with the theories exposed in the research and in contrast with the opinions of the teachers of the program exposed in the different interviews. At the same time, some surveys were used in order to reinforce the answers given by pre-service teachers as well as to identify the different semesters in which they are with the aim of giving a clear picture of the situations that currently arise in the Modern Languages degree at the UGC in relation to the use of AI in the development of their academic activities.

Exploratory Research Design

This research adopts exploratory research because the researchers want to investigate further a little-known problem in the university, the use of artificial intelligence by pre-service teachers. That said Ananya Swaraj (2019) exploratory research is the preliminary study of an unknown problem about which there is little or no knowledge characterized by its flexibility when a problem is broad and not specifically defined. The researchers use exploratory research because it allows them greater insight into the situation of why faculty members indicate that pre-service teachers are overusing and misusing artificial intelligences. This research was divided into three stages, researching and searching for the problem, analyzing the problem and doing interviews, and finally ending with the analysis of results and, as exploratory research allows, a possible hypothesis.

Critical Paradigm

The critical paradigm is defined as a theory of reflection of social autonomy where from the scientific point of view, there is a critical view which refers to the actions of transformation that identify a subject, that is to say that individuals transform or recreate realities from a critical-reflexive stance, Ricoy, C. (2006). For this reason, the research is approached from the critical paradigm since the pre-service teachers had a participation in which they had the opportunity to express their opinions and share their theories regarding the use of AI in their educational processes, which allowed them to have a critical and reflective analysis of the decisions they have made throughout their degree in which they have used AI and the possible impact that this may have on their educational process, in this way it can be seen that through the discourse, in this case of the pre-service teachers, different ways of understanding the realities they experience and making self-reflective decisions with critical awareness can be detected.

Scope

The scope of this research is focused on discovering which are the incidences that are being presented in the academic process of the pre-service teachers of the degree in Modern Languages in relation to the uses that they give to the AI to support their academic activities. It was decided to investigate these incidences since the teachers of the program sowed a doubt since they stated that the pre-service teachers were not being aware of the use that was given to the AI, in addition not being well trained for the use of the same, therefore their academic development is being affected skills such as critical thinking, on the contrary, the pre-service teachers argue that they do give a good use to the AI and consider that they are trained for its use, as a result of these inconsistencies the purpose is to make known what are really the situations that are occurring so that the program takes into account what happens and may occur in the future. Likewise, an analysis

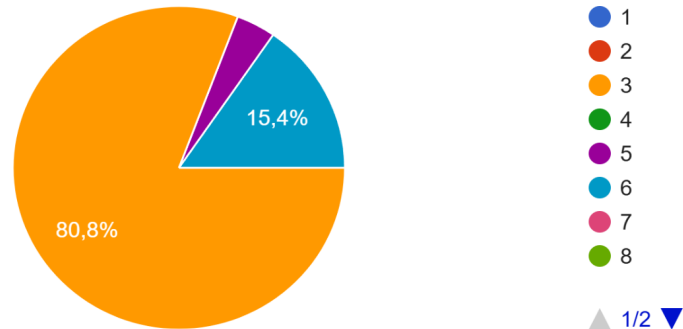
can be made where different strategies can be implemented for the benefit of both pre-services teachers and the program, since the use of AI can be encouraged with proper supervision to promote the development of skills and bring innovations in the program to make it more attractive to the UGC community.

Sample

The sample considered for this study were ninety-one (91) (Graphic 1, Graphic 2) students (pre-service teachers) from the second semester to the ninth semester of the Modern Languages Degree at the Universidad La Gran Colombia, this information was taken from the surveys obtained (Annex 1, Pag 1), located in the downtown area of Bogotá, Colombia. A selection was made from different classes of the course "Contextos Escolares", Intercultural Education, Microteaching 1, Psychology and Education, and Upper Intermediate. With these different subjects, it was possible to make the selection of this great variety of semesters in order to know the voices of the pre-service teachers depending on their experiences during the career, some will have more than others according to the semester. This selection was chosen in this way because the teachers of the faculty have doubts and concerns about the excessive use of artificial intelligence, which made the researchers want to obtain those answers with a high range of possibilities to know what is happening.

¿A qué semestre pertenece?

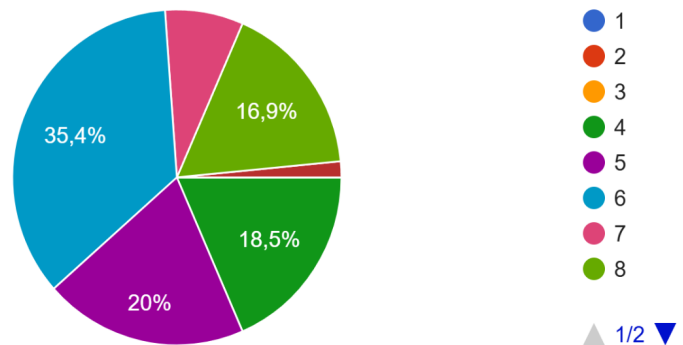
26 respuestas



Graphic 1 Spanish Survey (Annex 1, Pag 1)

In which semester are you?

65 respuestas



Graphic 2 English Survey (Annex 1, Pag 1)

Instruments

In this research the researchers wanted to make use of different instruments to obtain as much information as possible, taking into account the qualitative approach and it is an exploratory research. Different instruments were applied:

An interview with the professors of the degree (Annex 2), this was the main source of information for the researchers in order to find the problem of artificial intelligence and pre-service

teachers. Thanks to this, it was possible to analyze different answers from the professors about why they believe this is a problem for pre-service teachers. However, a survey was made to different pre-service teachers (Annex 6) to find out the validity of the professors' comments. Questions about whether they used artificial intelligences sometimes inappropriately, according to them, they used these artificial intelligences correctly and to improve academically, on the contrary, this was not convincing and the researchers wanted to inquire more about it since there were big differences between what professors mentioned and what pre-service teachers mentioned. After having investigated the problem, it was time to know the real opinion of the pre-service teachers. A group interview was made (Annex 3) with the pre-service teachers, this interview was made to different classes, what was done was to divide the classroom into three groups so that each researcher had the opportunity to have a conversation with the pre-service teachers, something much more personal, with this, the researchers could find unique and transparent answers. In this group interview different questions were asked, such as knowing each time the pre-service teachers used artificial intelligence, if they felt they knew how to use them, how they preferred learning, among others. Following this group interview, an individual survey (one in English and other in Spanish) was also made to each pre-service teacher (Annex 1), this survey had questions very similar or the same as those asked in the group interview, however, this was mainly to know the number of pre-service teachers who were interviewed and to support the previous interview information.

In order to be able to analyze the results, a matrix was made (Annex 4). This was crucial to organize the information, in the same way, first of all, the categories taken from the group interviews about the opinion of the pre-service teachers were divided, followed, these interviews were explained and to finish them, different examples taken from the group interview were added, giving a more precise approach. To finish with the instruments, the last one made was a

comparative chart (Annex 5), this was called "description of incidences of the use of ai in pre-service teachers", as the title says, it is the description of the incidences found and analyzed in this research. With this chart, the researchers wanted to show which incidences cause the students to use the artificial intelligences and they divided them between correct or incorrect taking into account the criteria given by the first interview to the professors of the degree.

Data analysis

During this part of the research, the researchers will show the studies and information carried out and obtained during the research. Through different matrixes, they will explain and classify the objectives and their results, the analysis of the interviews and surveys carried out, the results of these and the conclusions about all of the above, depending on the focus of each objective.

1st Specific objective: To identify how pre-service teachers are using the AI in their learning process into their bachelor degree.

Objective	Instrument	Category	Theory	Interpretation
1st Specific objective: To identify how pre-service teachers are using the AI in their learning process into their bachelor degree.	Survey A survey with 10 questions was made to determine the number of pre-service teachers to be interviewed, their semesters, and their opinions about artificial intelligence and the use of it in their academic process. Focal group Questions very similar to the survey were asked to be implemented during a discussion with different groups of pre-service teachers in order to find out their perspective on the use of AI and how they were using it.	IA The concept of LEARNING	- According to Rouhiainen (2018), artificial intelligences are machines capable of using algorithms, learning different types of information and using that information like humans, doing everything instantaneously. On the other hand, according to Numa-Sanjuán, Diaz-Guecha y Peñaloza-Tarazona (2024) AI in education is a total breakthrough, it improves educational processes, enhances students' autonomy and also emphasizes the importance of education not only for students, but also for teachers. - According to (Cruz Ordoñez Garcia et al., 2023), the implementation of AI in pre-service teachers works as an assistant for the development of different activities such as the creation of material, request for information or support in grading, however it is important to keep in mind that AI should always be seen as an aid but not as a replacement.	This research aims to know the pre-service teachers' perspectives on their opinion of artificial intelligences and how they use them in their learning processes. Implementing these instruments to collect information was the key to ensure that the pre-service teachers' voices are heard. Collecting responses from the pre-service teachers on how they use artificial intelligence, such as how they use it to improve their skills, to reinforce their learning in the classroom or to better understand topics are among the many responses obtained. The interviews and surveys allowed the research to have more details about these voices to know and have different answers to what pre-service teachers say, if it is a correct or incorrect use and, most importantly, why they do it.

Table 1 Matrix first objective data collection

In the following texts and charts, according to the objectives, we will explain how each of the interviews was analyzed depending on the objective and how they were analyzed. This research aims to know the pre-service teachers' perspectives on their opinion of artificial intelligences and how they use them in their learning processes. Implementing the pre-service teacher's interviews to collect information was the key to ensure that the students' voices are heard. Collecting responses from the pre-service teachers was essential to know how they use it to improve their skills, to reinforce their learning in the classroom or to better understand topics among the many responses obtained.

It is important to clarify the reason for both instruments. The proposal was to implement a survey with 10 questions which would give answers to: Semester, career, what do they think about artificial intelligence, when do they use it, why do they use it, etc. However, it is clear that just one survey with multiple choice answers was not going to be enough. To ensure a complete data collection, a focus group interview was made, which was like an interview with different pre-service teachers at the same time in which a talk was made with questions very similar to the survey, with this, it would recollect even more information and give the pre-service teachers the confidence to talk and share their experiences and thoughts about everything related to artificial intelligence without affecting them, and so it was. Thanks to this talk, much more information could be collected, more complete and with more data to analyze.

Taking into account the theory, it mentions that the use of AI in learning is to help the student, more as a support and not as an escape, it is a tool to facilitate the learning process, not to replace it. However, it is noted that something does not fit with what was evidenced, there is a difference between pre-service teachers who follow this theory, which is to use artificial intelligences as tools to help them, but others do not, others use them to avoid different situations on many occasions. There are a lot of answers obtained, with those answers, it was able to know how pre-service teachers are using those tools, the AI in their classes or in their learning process. For example, a lot of them mentioned that they were studying and practicing to get the C1 level in English, how? Pretty simple, asking an AI and requesting about how an exam is composed and what question could be asked. Another example, some pre-service teachers use those AI's to improve their lesson plans, asking about new ideas, games, different explanations, etc. On the other hand, others are using it to escape from their responsibilities in different subjects, the most common subjects are the ethics classes or the humanities classes, they explained that those classes are simply

boring and they don't have the enough motivation to do all the homework and activities left in class, because they have nothing to do or relating with what they are studying. Lack of time was also one of the most common, many teachers in training are already working, which makes them not have enough time to do all their homework. However, thanks to AI, they can require these and take advantage of all the information and possibilities that AI has. With this, not only could homework be done, but also different presentations or ways of studying could be applied from them.

2nd Specific objective: To categorize the information related to how pre-service teachers are implementing the AI in their learning process.

Objective	Instrument	Category	Theory	Interpretation
2nd Specific objective: To categorize the information related to how pre-service teachers are implementing the AI in their learning process.	Matrix Matrix based on the information previously collected in the surveys and focal group interviews, from which 7 categories that synthesize the information were chosen according to the similarities of the answers of the pre-services teachers in relation to the implementation of AI in their academic processes.	The concept of learning Critical Thinking IA	According to Piaget (1950), learning is the capacity to learn and acquire knowledge by interaction and adaptation, also it is important to develop different skills and it is the capacity to learn that has granted humanity an unparalleled level of flexibility and adaptability. For this reason, at the moment to interact with de IA permit to improve and practice the learning according to the needs. According to Paul, R & Elder, L. (2003), critical thinking allows pre-service teachers to assume a personal position regarding the situations that may arise in relation to the use of AI. Teachers in training have the ability to decide and be critical about the educational processes they develop and at the same time decide to rely on AI as an aid for the improvement of their learning. According to Rouhiainen (2018), artificial intelligences are machines capable of using algorithms, learning different types of information and using that information like humans, doing everything instantaneously. On the other hand, according to Numa-Sanjuán, Diaz-Guecha y Peñaloza-Tarazona (2024) AI in education is a total breakthrough, it improves educational processes, enhances students' autonomy and also emphasizes the importance of education not only for students, but also for teachers. Matrix permits to categorize the information and reflections that the pre-services teachers have at the moment they use the IA in their learning process and their opinions related to the in which moments they use the IA and how.	Categorizing information is essential for understanding and selecting the best opinions held by pre-service teachers. Pre-services teachers believe that the use of IA and its effects depend on the situations and the awareness with which each person uses it, since it is evident that pre-services teachers prioritize their academic activities depending on their interests and what they see as most important for their professional life in addition to factors such as work and time that also influence their process, all this information is reflected in the matrix with their respective opinions. The following categories arise from the above: lack of time, utility, creativity, second language reinforcement, understanding topics from other subjects, lack of interest in the subject, demotivation, categories explained in a matrix designed with the pre-service teachers' voices. In addition, this categorization of information reinforces the theories previously explained and the opinions that some teachers expressed at the beginning of the research.

Table 2 Matrix second objective data collection

The categorization is based on the surveys and focal interviews conducted with the pre-service teachers, this information is crucial for the research since it allows identifying the opinions of the pre-service teachers in addition to reinforcing the theories proposed above, these theories were selected according to the testimonies given by the teachers of the program and thus being able to create a relationship of all the information.

The findings that can be seen in the matrix (Annex 4) are very important for the research since they show the decisions and points of view that pre-service teachers have at the moment of using AI to support their academic processes, pre-service teachers say that the use they make of AI depends on the following reasons with which they base their use of AI taking into account that AI is a tool that works with different algorithms and existing information transformed to a new era focused more on human reality, since AI can provide in its entirety the information that is requested it is possible that pre-service teachers fall into errors such as conformism and reliability when applying the use of AI in their learning processes and academic activities. The reasons mentioned above are:

Lack of time, it alludes to the constraints that pre-service teachers might face when carrying out various tasks; in other words, their availability for the creation of the activities is not guaranteed.

Utility, that is to say pre-service teachers describe AI as a tool that can help them learn and perform better. They also see AI as an easily accessible and useful resource that can be tailored to meet their individual needs.

Creativity, pre-service teachers frequently become frustrated when they are unable to generate original ideas, for this reason pre-service teachers turn to IA to help them with their various project class planning as a prime example in order to obtain fresh or more efficient ideas.

Second language reinforcement, with IA, is linked to the improvement and acquisition of a second language, as well as to the acquisition of new knowledge focused on vocabulary, simplified explanations and supporting data.

Finally, the last two categories are joined together, which are lack of interest in the subject and demotivation, it refers when taking classes that pre-service teachers do not consider relevant, they often use Artificial Intelligence to perform their tasks, then has a negative impact on the learning process of pre-service teachers and, therefore, contributes to the misuse of AI.

One of the most important points for this research is the classification of the information since it allows a better vision of the situations and thoughts that the pre-service teachers have and the theories that confirm reinforce these interpretations, which is why the nuance is one of the most appropriate instruments for this analysis.

3rd Specific objective: To describe the incidences of the use of AI in pre-service teachers from the bachelor in Modern Languages at the UGC.

Table 3 Matrix third objective data collection

Objective	Instrument	Category	Theory	Interpretation
3rd Specific objective: To describe the incidences of the use of AI in pre-service teachers from the bachelor in modern languages at the UGC.	Comparative Chart	AI	According to Vanzeto and Rodriguez (n.d.) Artificial intelligence is different algorithms that provide information, thus helping you to understand it, which makes it an optimal tool. This contributes to learning in various areas, including language learning.	The implementation of the chart call description of incidences of the use of ai in pre-service teachers as a data collection instrument and a support tool to categorize relevant elements of this research is crucial to understand the importance, the impact and the implications of the use of artificial intelligence in university education specifically in the modern language program at La Gran Colombia University. Furthermore, to comprehend how it works in the learning process of the pre-service teachers and their abilities as critical thinking, which can be affected by its use.
	Research instruments were used to explain and classify the information collected through surveys and focal groups.		Learning is essential to acquire knowledge and adapt it to our capabilities (Ormrod, 2008). The use of AI in learning brings benefits and challenges to the pre-service teacher's skills and understanding depending on how it is used, e.g., influencing or affecting critical thinking.	
	This instrument allows the description of the incidences of AI in pre-service teachers based on their responses, which are relevant to this study.	The concept of learning	The use of AI directly influences learning, according to Morales Zúñiga, L. C. (2014), in aspects such as analysis, evaluation, and decision-making, affecting the critical thinking of the pre-service teacher.	At the same time, the opinions, experiences of pre-service teachers towards the use of AI provide this research with extensive insight into the incidences which are described and demonstrated in the chart description of incidences of the use of AI in pre-service teachers for a better understanding.
		Critical thinking	The comparative chart is a fundamental tool for describing the incidences and different points of view of the use of AI in the pre-service teacher's learning process.	

The compiled information, answers and results obtained from the various instruments such as surveys and focus groups interview that were categorized in the matrix help to have a broader view of the field of AI use in higher education. This relevant data was synthesized in the last instrument of analysis of this research (Annex 5), which is a comparative chart called “the description of the incidences of the use of AI in pre-service teachers”, which presents the different circumstances or situations in which AI is used by pre-service teachers of the Modern Languages bachelor's degree at the UGC and how the use of AI directly impacts the development of their

learning process as well as the progress of their abilities. In the same manner, thanks to the direct intervention with the pre-service teachers, positive aspects of the use of AI were identified such as being a technological, innovative and versatile tool, students can rely on it to learn and reinforce information, which contributes significantly to their knowledge. Even so, factors such as that the excessive use of AI can provoke a reduction of critical thinking, authenticity, curiosity or that the tool is used out of laziness and lack of time were very common items found among the pre-service teachers' answers.

It is by these considerations and among many others relevant to this research that several categories were created in the comparative chart which can be presented positively or otherwise negatively in their learning process. To go deeper, 6 main incidences related to the use of AI in pre-service teachers were found:

The time: negative and positive incidences were discovered at the same time, since it optimizes the time to look for information, summarizes it and gives a clear overview of the search, however, this use for the time, can turn into dependence, since pre-service teachers, not having time, tend to always look for information there and do not analyze or deepen beyond what the tool provides, which has negative repercussions.

The use of AI: the proper use helps the deepening, understanding of a topic or the acquisition and reinforcement of a foreign language, nevertheless its improper use brings consequences such as not examining the information, its veracity or reliable sources, which causes the pre-service teacher to make mistakes in their task or even not understand it or gain any significant knowledge.

The creativity: It is positively affected by the use of AI, since the implementation of this tool can generate new ideas, innovative material and even help to plan a structured class with

dynamic activities, but the excessive use of this resource can cause the pre-service teacher to lose his teaching style and not to conclude his own ideas for his classes or activities.

Skills reinforcement: The use of IA positively influences the progress of skills and competencies of pre-service teachers using AI as a study strategy for learning a second language.

Critical thinking: The ability to analyze information and adapt it is affected, as well as the capacity to solve problems, since the problem is given to the AI, making it do the cognitive work, instead of the person himself. This is a negative impact that affects the learning and cognitive process of pre-service teachers.

The interest: It refers to the use of AI to get out of an activity or topic that is considered boring, either because of the subject matter, class methodology or because the teacher himself is the one who makes the students unmotivated to learn.

Finally, the main purpose of this chart is to describe the incidences found in the pre-service teachers in the Modern Languages program at the UGC in order to understand the functioning and nature of the phenomenon of using artificial intelligence in academic and formative exercises, in other words, in educational contexts. In the meantime, to find concurrent trends concerning the use of AI and its impact on the learning process of the pre-service teacher.

CHAPTER III: Results and conclusions

This study has implemented surveys and interviews as key instruments and tools to identify different perspectives, opinions and experiences of how pre-service teachers are using artificial intelligence in their learning process and how it directly influences. Similarly, thanks to the information collected from the different participants of the Modern Languages Program at the Universidad La Gran Colombia, different results were obtained that provide a wide insight to

achieve the final objective of this study, which is to find and describe the incidences of the use of artificial intelligence in pre-service teachers.

Different interviews were conducted with professors to obtain opinions about the use of AI in pre-service teachers. (Annex 2), resulting in responses such as “los estudiantes no analizan, no leen, no le ponen su voz, no cuestionan lo que la IA dice,(...), definitivamente lo del pensamiento crítico sí que está quedando estancado por lo mismo porque los estudiantes no están haciendo de su parte, analizar”. Translation: “Students do not analyze, they do not read, they do not add their voice, they do not question what the AI says, (...), definitely critical thinking is stagnating for the same reason because students are not doing their part, analyzing” (Professor 1, annex 2, page 2) also one of them mentioned “los divido en dos grandes grupos uno son los estudiantes que realmente usan la IA como una herramienta para optimizar su tiempo, mejorar su aprendizaje, (...) y tenemos otro grupo grande que lo que hacen es usarla no de manera adecuada y aquí es donde se presentan los temas en los que ellos ya no quieren ni siquiera pensar en una simple respuesta sino quieren siempre estar copiando y pegando”. Translation: “I divide them into two large groups: one is the students who really use AI as a tool to optimize their time, improve their learning, (...)

Also, we have another large group that does not use it properly and this is where the topics arise in which they no longer want to even think about a simple answer but always want to be copying and pasting”. (Professor 2, annex 2, page 3) or another perspective that was obtained was “yo creo que hacen un uso incorrecto, inadecuado de las inteligencias artificiales”. Translation: "I think they are making incorrect and inappropriate use of artificial intelligence.". (Professor 4, annex 2, page 8)

After these answers, among many others important for this research, it was decided to implement a basic survey (Annex 6), to find out what was the opinion of the pre-service teachers

regarding the same topic of AI and its use. In these were found opposite answers to what the professors said, to which was born a big added question of why the professors argue this way and the students think totally different. Due to this divergence and contrasting positions, it was determined to deepen the study with the pre-service teachers to find out the real use they give it and thus know the main incidences.

Based on the above, focus groups were implemented in which the researchers were able to get closer to the students and really know what they thought and the actual use they made of AI in their learning process. They have stated in declarations such as “lo utilizo para hacer una conversación en inglés, digamos que para practicar, para tener más influencia, más naturalidad al hablar. Entonces en la inteligencia artificial hay una opción en donde tú le puedes hablar, entonces eso también es una herramienta para tener esa habilidad de hablar en inglés”. Translation: "I use it to have conversations in English, so to speak, to practice, to have more fluence, to speak more naturally. Then, in artificial intelligence, there's an option where you can speak to it, so that's also a tool for developing that ability to speak English" (Upper intermediate student, annex 3, page 12), one of them said, “nos ayuda a todos acá en bastantes cosas. Se puede usar de diferentes maneras, bien o mal, dependiendo de cómo lo quieras”. Translation: "It helps us all here with so many things. It can be used in different ways, good or bad, depending on how you want it "(Microteaching 1 student, annex 3, page 93) another argued that “Es una buena herramienta, pero hay que saber cómo usarla”. Translation: “It is a good tool, but you have to know how to use it” (Psychology and education student, annex 3, page 104), likewise a different participant said “a mí en cierta parte me ha creado como una dependencia, porque ya es como, no por mi propia parte hago, es como el esfuerzo de intentar entender por mi cuenta, estudiarlo, sino que ya es como, todo me lo simplifica Chat GPT, por así decirlo, entonces ya lo tengo ahí y sale y ya”. Translation: “In a

certain way, it has created a kind of dependency for me, because it's like, not on my own part, but rather the effort of trying to understand on my own, to study it, but rather, it's like, Chat GPT simplifies everything for me, so to speak, then I have it there and it comes out and that's it.”(Psychology and education student, annex 3, page 107), another comment given was “yo creo que en sí las IAS no son lo malo, sino el uso que le damos. O sea, nosotros como estudiantes debemos aprender a usarlas, no a recargarnos en ellas porque eso nos va a hacer dependientes y a largo plazo vamos a dejar de desarrollar habilidades como pensamiento crítico, razonamiento, creatividad, etc”. Translation: "I believe that IAS in and of themselves are not the bad thing, but rather the use we give them. In other words, we as students must learn to use them, not rely on them because that will make us dependent and, in the long term, we will stop developing skills such as critical thinking, reasoning, creativity, etc". (Intercultural education student, annex 3, page 118).

These data were then confirmed with a more specific survey of the use of AI (Annex 1), which helped the investigation to obtain information to classify in a matrix, the following categories were found:

Lack of time: This refers to the availability of time that pre-service teachers have to perform their tasks, which is not enough, so they use AI to accommodate their time. According to this category, pre-service teachers from different semesters discussed the results as indicated below:

“Y luego no sé cómo tenéis vosotros aquí la carga lectiva, pero cuando es muy grande nos tenemos que salvar el... iba a decir una expresión española, sí, nos tenemos que salvar el pellejo”. Translation: And then I don't know how you have the teaching load here, but when it's very heavy we have to save our... I was going to say a Spanish expression, yes, we have to save our skin”. (Contexto escolares student, annex 3, page 7)

“Y pues, por otro lado, cuando salgo un fin de semana super cansada y no me acuerdo de tal trabajo, por X o Y razón, obviamente la noche, el domingo, la noche que llego super cansada del trabajo, pues busco. Obviamente desde que no, está bien. Sin embargo, entonces es la única solución”. Translation: “And then, on the other hand, when I go out on a weekend super tired and I don't remember such and such work, for X or Y reason, obviously the night, Sunday, the night I get home from work super tired, well, I look for it. Obviously since I don't, it's fine. However, then it is the only solution”. (Upper intermediate student, annex 3, page 55)

“Lamentablemente no cuento con el tiempo. Entonces para mí, últimamente, yo creo que es una gran ayuda por temas de tiempo también”. Translation: “Unfortunately I don't have the time. So for me, lately, I think it is a great help because of time issues as well”. (Psychology and education student, annex 3, page 72)

Utility :How pre-service teachers adapt AI to their learning activities and needs, using it as a support tool for accessible information search. According to this category, pre-service teachers from different semesters discussed the following results:

"La usaba mucho para que me ayudara a dar ideas para poder adoptar material específico para él o cuando, por ejemplo, necesitaba ideas sobre un tema que realmente nos gustaba mucho". Translation: “I used it a lot to help me come up with ideas so I could adopt specific material for him or when, for example, I needed ideas on a topic that we really liked a lot.” (Contextos escolares student, annex 3, page 91)

"Por ejemplo, en parciales o en exámenes uno se bloquea, por experiencia le digo, uno se bloquea porque uno no sabe, entonces uno se vuelve muy dependiente y sería ahí lo más... realmente uno se ayuda es por la guía". Translation: “For example, in midterms or exams one gets blocked, from experience I tell you, one gets blocked because one does not know, then one becomes

very dependent and it would be there the most... one is really helped is by the guide”. (Psychology and education student, annex 3, page 32)

“Yo la uso como para simplificar un poco más las cosas y a veces cuando ya es muy difícil”. Translation: “I use it to simplify things a little more and sometimes when it is already very difficult”. (Psychology and education student, annex 3, page 102)

“Yo hasta uso Chat GPT como traductor. O sea, si hay alguna palabra que no entiendo, de una pero yo en serio todos los días en cuanto a esos fines.” Translation: "I even use Chat GPT as a translator. I mean, if there is a word I don't understand, from one but I take it seriously every day for those purposes". (Psychology and education student, annex 3, page 106)

Creativity: Pre-service teachers use AI to generate new ideas for their academic assignments and even their lesson plans. According to this category, pre-service teachers from different semesters discussed the results as indicated below:

"Yo también buscaba como que me diera ideas para nosotros pues mirar a ver cómo podríamos adecuarlas a nuestro plan, a las clases y demás". Translation: “I was also looking for ideas for us to see how we could adapt them to our plan, to the classes and so on”. (Microteaching 1 student, annex 3, page 38)

“No sé, de pronto es porque uno tiene las ideas y no sabe cómo organizarlas. Entonces, tú le das la idea como básica a Chat GPT y Chat GPT te ayuda a acomodarlo, o a poner un dialecto más conforme a lo que quieres poner en el escrito, sea formal o no informal”. Translation: "I don't know, sometimes it's because you have ideas and you don't know how to organize them. Then, you give the idea as basic to Chat GPT and Chat GPT helps you to accommodate it, or to put a dialect more in accordance with what you want to put in writing, whether formal or not informal". (Microteaching 1 student, annex 3, page 94)

“Puede ser una herramienta muy útil desde que uno sepa cómo utilizarla. No hay que botarle a que uno le haga todo, sino que puede ser una buena herramienta de pronto para sintetizar información o de pronto algunas veces hasta para brindar ideas”. Translation: "It can be a very useful tool as long as you know how to use it. You don't have to throw everything at it, but it can be a good tool to synthesize information or sometimes even to provide ideas". (Psychology and education student, annex 3, page 102)

Second language reinforcement: Pre-service teachers use AI to develop their second language skills and, at the same time, acquire new knowledge. According to this category, pre-service teachers from different semesters discussed the following results:

“Lo que hago es buscarlo en español y yo misma lo traduzco a mi inglés, ¿me entiendes? digamos, por ejemplo, me sale un texto y subrayar ideas de ese mismo texto. Dependiendo de esas ideas es que genero mi propio texto”. Translation: “What I do is look it up in Spanish and I translate it myself into my English, you know what I mean? let's say, for example, I get a text and I underline ideas from that same text. Depending on those ideas, I generate my own text”. (Intercultural education student, annex 3, page 75)

“También lo utilizo para hacer una conversación en inglés, digamos que para practicar, para tener más fluencia, más naturalidad al hablar. Entonces en la inteligencia artificial hay una opción en donde tú le puedes hablar, entonces eso también es una herramienta para tener esa habilidad de hablar en inglés”. Translation: “I also use it to make a conversation in English, let's say to practice, to have more fluency, more naturalness in speaking. Then in artificial intelligence there is an option where you can talk to it, so that is also a tool to have that ability to speak in English” (Upper intermediate student, annex 3, page 12)

“También en cuanto a explicaciones, a veces, no sé, que tú le preguntas como, diferencias entre el in, on y at. Entonces, hay veces que eso sí también te lo puede explicar bien o, digamos, si usas otra IA, también te dice hasta videos, podcasts incluso de eso. Ejemplos, situaciones que te pueden ayudar mucho”. Translation: "Also in terms of explanations, sometimes, I don't know, you ask them how, differences between in, on and at. Then, there are times when it can explain it well or, let's say, if you use another AI, it even tells you videos, podcasts, even about that. Examples, situations that can help you a lot". (Microteaching 1 student, annex 3, page 98)

Understand topics from other subjects: The pre-service teachers use the AI to address their concerns about a topic, or to make it easier to understand a text. According to this category, pre-service teachers from different semesters discussed the results as indicated below:

"Pero la uso solo en ocasiones cuando no entiendo una lectura le pido a la IA un resumen. Yo leo el resumen personal y vuelvo a leer la lectura para que pueda adquirir un poquito más de conocimiento y pueda entender también esta cuestión". Translation: "But I use it only sometimes when I don't understand a reading I ask the AI for a summary. I read the personal summary and reread the reading so I can gain a little bit more knowledge and I can understand this issue as well". (Upper intermediate student, annex 3, pages 55-56)

"Yo siento que depende mucho del tema. Si el tema es básico, pues está bien que te baten la información así como listo, fácil, rápido. Pero si el tema es complicado y tú sientes que tienes que ir muy, muy en la profundidad para poder entender". Translation: "I feel that it depends a lot on the topic. If the topic is basic, then it's fine that you get the information just like ready, easy, fast. But if the topic is complicated and you feel that you have to go very, very deep to understand". (Psychology and education student, annex 3, page 33)

"Ella le pide a Chat GPT que desglose el tema para entender, digamos en temas que son muy complicados algunas veces no se en alguna de las materias de desglosa". Translation: "She asks Chat GPT to break down the subject to understand, let's say in subjects that are very complicated sometimes I don't know in some of the subjects to break it down". (Upper intermediate student, annex 3, page 64)

Lack of interest in the subject: Pre-service teachers tend to use AI when the subject is not engaging or relevant, it does not generate interest. According to this category, pre-service teachers from different semesters discussed the following results:

"La verdad, o sea, las materias de rellenos son más que ensayos, que resúmenes y todo eso. Ok. Yo lo hago pues para salir de eso. ¿Sí? Rápido". Translation: "The truth, I mean, the fill-in subjects are more than essays, than summaries and all that. Ok. I do it to get out of that. Yes? Quickly". (contexto escolar student, annex 3, pages 133-134)

"Bueno, en mi caso, pues yo sé que no debería, pero hay veces que materias que yo considero que no son importantes para mí, como no sé, alguna lectiva, alguna ética, que sí son como, a mí me parecen como mamonas. Pero si yo sé que no debería, pues sí lo he hecho, la verdad. Decir que no sería una mentira". Translation: "Well, in my case, I know I shouldn't, but there are times when I consider that some subjects are not important to me, like, I don't know, some of them, some ethics, that are like, to me, they seem to me to be boring. But if I know that I shouldn't, then I have, to be honest. To say no would be a lie". (Microteaching 1 student, annex 3, page 96)

"Pero digamos, hay materias que digo, como, no me gustan, me ahorro leer cosas que no estoy interesada o en lo que no le veo como la gracia, y lo hago". Translation: "But let's say, there are subjects that I say, like, I don't like, I save myself from reading things that I'm not interested in or what I don't see the fun in, and I do." (Microteaching 1 student, annex 3, page 62)

Demotivation: different factors can influence the misuse of AI, which can have repercussions on pre-service teachers' skills and acquisition of new information. According to this category, pre-service teachers from different semesters discussed the results as indicated below:

“Pues más que todo es por la pereza, ¿no? Pero igual sí me siento mal. O sea, siento que sí, como que he dejado el lado de pensar, o sea, yo mismo pensar las cosas y hacer las cosas por mi conocimiento”. Translation: “Well, it's mostly laziness, isn't it? But I still feel bad. I mean, I feel that yes, like I have left the side of thinking, that is, I myself think about things and do things for my knowledge”. (Contextos escolares student, annex 3, page 129)

“Y pues yo evito usarla porque uno, genera pereza y dos, también nos quita la habilidad de investigar, de indagar y buscar fuentes viables para mejores ensayos, para mejores artículos que puedes decir, ah, no, yo lo saqué de aquí y ya”. Translation: “And well, I avoid using it because one, it generates laziness and two, it also takes away our ability to research, to investigate and look for viable sources for better essays, for better articles that you can say, ah, no, I got it from here and that's it”. (Contextos escolares student, annex 3, page 129)

“En cuanto al pensamiento autónomo, el pensamiento autónomo, un pensamiento crítico, pues lo limita muchísimo, el plagio, porque muchas veces no, así igual uno lo parafrasee, sigue siendo plagio”. Translation: “As for autonomous thinking, autonomous thinking, critical thinking, well, it limits it a lot, plagiarism, because many times, even if you paraphrase it, it is still plagiarism” (Psychology and education student, annex 3, page 108)

With this data, a more solid content base was created to identify the impact of the use of AI in their learning process.

In relation to the aforementioned, as a final instrument it was decided to create a comparative chart (Annex 5) to describe the incidences that were found around the focus group in

conjunction with the survey. The comparative chart was named “Description of the incidences of the use of IA in pre-service teachers” it is divided in 6 important categories that were discovered and finally they are the incidences detected in the pre-service teachers. The 6 categories are the following:

Time: It is presented in a positive way to optimize the search time of a topic, at different ways to synthesize or summarize information, as can be the case of extensive texts and in this manner provide the pre-service teachers with only the most important points of the reading. This facilitates knowledge acquisition and problem solving. Some of the responses according to this category were:

“Pues, yo no, para hacerlo todo, si todas mis tareas como tal, pero sí se usa, para la automatización de trabajos a veces, porque pues uno requiere ahorrar tiempo”. Translation: “Well, I don't, to do everything, if all my tasks as such, but it is used, for the automation of jobs sometimes, because one needs to save time”. (Upper intermediate student, annex 3, page 12)

“Yo trabajo, yo casi ya no tengo tiempo para hacer tareas, entonces si me toca recurrir mucho a chat, por favor resúmenme este texto, ya le pregunto ideas principales, conceptos clave y ya con eso me ayuda el resto de la clase”. Translation: “I work, I almost don't have time to do homework, so if I have to resort to chatting a lot, please summarize this text, I ask for the main ideas, key concepts, and that helps me with the rest of the class”. (Intercultural education student, annex 3, page 22)

“Yo también lo usó más en lecturas. Cuando no alcanzo a leer por temas de trabajo o de tiempo, pido que me de resúmenes”. Translation: "I also use it more for reading. When I don't get to read because of work or time, I ask for summaries". (Psychology and education student, annex 3, page 65)

On the other hand, time can also have a negative impact when the pre-service teachers, due to lack of time, become dependent on its use and its facility to solve any task, in addition to not ensuring that the information provided by the tool is correct. All these elements mentioned above have repercussions on the learning process. Some of the responses according to this category were:

“El problema son los de cypaste, simplemente la gente es perezosa, es muy perezosa. Entonces es como: hay, no tengo tiempo, hay más cosas que hacer, mejor copy paste y ya”. Translation: "The problem is cypaste, people are just lazy, they are very lazy. So it's like: there, I don't have time, there are more things to do, better copy paste and that's it." (Microteaching 1 student, annex 3, page 59)

“En lo negativo la mayoría tenemos poco tiempo, entonces yo suelo hacer resúmenes totalmente con IA de algunos de estos temas”. Translation: “On the negative most of us are short on time, so I tend to do summaries entirely with AI on some of these topics.” (Contextos escolares student, annex 3, page 92)

Use of AI: It is presented in a positive way as a support tool for academic processes, being also a study strategy to learn a foreign language. The use of AI in pre-service teachers also reinforces elements such as grammar, vocabulary and promotes the understanding of other educational materials such as difficult readings.

“Pues, en mi caso, yo lo uso como una herramienta. Es decir, a mí me proponen un tema que tengo que explicar frente a una clase y, obviamente, pues, busco la estructura, más o menos así, pero siempre le pregunto como, bueno, ¿qué actividad puedo hacer frente a esto? Si puedo solo generar una conversación, no sé”. Translation: "Well, in my case, I use it as a tool. I mean, they propose a topic that I have to explain in front of a class and, obviously, well, I look for the structure,

more or less like that, but I always ask like, well, what activity can I do in front of this? If I can just generate a conversation, I don't know". (Upper intermediate student, annex 3, page 13)

“Pues yo la uso todos los días, porque pues siento que es una buena herramienta si uno la sabe usar, ¿sí? Por ejemplo, con otros idiomas, la inteligencia artificial pues sabe absolutamente todos los idiomas, entonces uno ahí se puede apoyar bastante”. Translation: "Well, I use it every day, because I feel that it is a good tool if you know how to use it, right? For example, with other languages, artificial intelligence knows absolutely all languages, so you can get a lot of support there". (Psychology and education student, annex 3, page 28)

“La IA yo la utilizo algunas veces para colocar palabras, tiempos y demás. Utilizó como herramienta para guiar en caso de que algo me haya quedado mal la guía o tal, porque aquí tienes que ir para mejorar”. Translation: "I use the AI sometimes to place words, tenses and so on. I use it as a tool to guide in case I got something wrong with the guide or such, because here you have to go to improve." (Contextos escolares student, annex 3, page 92)

On the contrary, an inadequate use of AI makes the pre-service teacher susceptible to be dependent on it, besides making mistakes in their tasks because they do not know how to use it, since they do not validate the information, its veracity, and often do not know how to make the prompt correctly, this also leads to errors generated.

“Realmente, prácticamente como profesor es el hecho de que te ahorra tiempo, te facilita una información. Sin embargo, el contra es el hecho de que uno se vuelve muy dependiente a la IA”. Translation: "Really, practically as a teacher it's the fact that it saves you time, it provides you with a piece of information. However, the downside is the fact that you become very dependent on the AI." (Upper intermediate student, annex 3, page 50)

“ A mí en cierta parte me ha creado como una dependencia, porque ya es como, no por mi propia parte hago, es como el esfuerzo de intentar entender por mi cuenta, estudiarlo, sino que ya es como, todo me lo simplifica Chat GPT, por así decirlo, entonces ya lo tengo ahí y sale y ya. Entonces siento que sí es como una dependencia que he creado ahí”. Translation: "To me, to a certain extent, it has created a kind of dependency, because it's like, it's not my own effort to try to understand on my own, to study it, but it's like, Chat GPT simplifies everything for me, so to speak, so I already have it there and it comes out and that's it. So I feel that it is like a dependency that I have created there".(Psychology and education student, annex 3, page 107)

“Pues, en cuanto a eso, sí es algo negativo. Porque, si uno empieza a usar la IA, pues, como muy continuamente, pues va a generar una dependencia en ella”. Translation: "Well, in terms of that, it is a negative thing. Because, if you start using the AI, well, if you start using it, you are going to become dependent on it. (Intercultural education student, annex 3, page 77)

“Pues, pensándolo negativamente, si nos volvemos muy dependientes y ya no pensamos por nosotros mismos, sino que ya no sabemos cómo hacerlo si no la tenemos a la mano. Esa sería la parte negativa de cómo no hacerlo. Por ejemplo, en parciales o en exámenes uno se bloquea, por experiencia le digo, uno se bloquea porque uno no sabe, entonces uno se vuelve muy dependiente”. Translation: "Well, thinking about it negatively, if we become very dependent and no longer think for ourselves, but no longer know how to do it if we don't have it at hand. That would be the negative part of how not to do it. For example, in midterms or exams one gets blocked, from experience I tell you, one gets blocked because one does not know, then one becomes very dependent." (Psychology and education student, annex 3, page 32)

Creativity: AI and its different functions, being innovative, generates that the pre-service teacher is interested in using it for his academic activities or tasks, offering him the possibility of creating new ideas or new materials in the case of making lesson plans.

“Lo utilizamos a modo de herramienta de creatividad para que nos pueda decir si nuevas ideas para poder utilizarla”. Translation: “We use it as a creativity tool so it can tell us if new ideas so we can use it.” (Contextos escolares student, annex 3, pages 2-3)

“Bueno, yo de Pro veo que es también una facilidad para los profesores para poder dar ideas a una clase o crear nuevas actividades innovadoras”. Translation: “Well, I see the pro that it is also a facility for teachers to be able to come up with ideas for a class or create new innovative activities.” (Upper intermediate student, annex 3, page 49)

“Yo también buscaba como que me diera ideas para nosotros pues mirar a ver cómo podríamos adecuarlas a nuestro plan, a las clases y demás”. Translation: “I was also looking for ideas for us to look at how we could adapt them to our plan, to the classes and so on”. (Microteaching 1 student, annex 3, page 38)

In contrast, the excessive use of AI causes the pre-service teachers to be unable to think creatively on their own, as the AI generates all the ideas for them. This causes their own learning style or even teaching dynamics to be affected and the information provided by the AI is not adapted to their own style.

“Porque a lo mejor no tenemos originalidad o creatividad en esta asignatura por falta de tiempo, porque a lo mejor nos hemos organizado mal y como ha dicho el compañero, tenemos tres tareas, una no llegamos, pues inteligencia artificial”. Translation: “Because maybe we don't have originality or creativity in this subject because of lack of time, because maybe we have organized

ourselves badly and as the colleague said, we have three tasks, one we don't get to, so artificial intelligence.” (contextos escolares student, annex 3, page 2)

“En muchas ocasiones por el uso excesivo de inteligencia artificial y hasta la lectura más fácil que uno sabe que es súper sencilla.

Pues se apoya en esas ideas y si está afectando mucho como el razonamiento crítico y nuestras opiniones con respecto a varios temas. Si no tenemos una IA, no, mejor dicho, morimos”.

Translation: "In many occasions due to the excessive use of artificial intelligence and even the easiest reading that one knows is super simple.

Well, it relies on those ideas and if it is affecting a lot like critical thinking and our opinions regarding various issues. If we don't have an AI, we don't, rather, we die." (Psychology and education student, annex 3, page 31)

“Por ejemplo, cuando los profesores, nosotros como estudiantes, cuando los profesores nos mandan trabajos, muchas veces por facilitarlos, pues, los hacemos con inteligencia artificial, lo que nos impide, pues, muchas veces pensar por nosotros mismos o investigar”. Translation: “For example, when teachers, we as students, when teachers send us assignments, many times to facilitate them, well, we do them with artificial intelligence, which prevents us, well, many times from thinking for ourselves or researching.” (Contextos escolares student, annex 3, page 128)

Skills reinforcement: The use of AI encourages pre-service teachers to use AI to improve their knowledge and language level.

“A mí me gusta, digamos, para los phrasal verbs, digamos, cuando hay unos que son muy parecidos y que tienen a veces, digamos, el mismo contexto general o la misma definición. Me gusta preguntarle”. Translation: "I like, let's say, for phrasal verbs, let's say, when there are ones

that are very similar and that have sometimes, let's say, the same general context or the same definition. I like to ask him." (Upper intermediate student, annex 3, page 12)

“Bueno y pues ya en este caso siempre lo he usado, es más que todo para hacer la corrección de textos. Es decir, yo genero un texto medianamente grande y pues se lo paso para que exactamente me digan dónde está el error, con qué verbo juego, quizás pudo haber sido en el uso de algún auxiliar o en este caso también lo uso cuando tengo que planear clases. Entonces el hecho de que trato de preguntarle como qué temas puedo generar frente a este tema o qué ejemplos”. Translation: "Well, in this case I have always used it, it is mostly for the correction of texts. That is, I generate a moderately large text and then I pass it to them so that they tell me exactly where the error is, with which verb I play, perhaps it could have been in the use of some auxiliary or in this case I also use it when I have to plan classes. So the fact that I try to ask them what topics I can generate in front of this topic or what examples".(Upper intermediate student, annex 3, pages 12-13)

“Pues yo creo que de pronto es casi similar a lo que ella dice porque muchas veces nosotros lo utilizamos como para aprender un tema que se nos dificulta o como a entender a nuestra forma de percibir las cosas los temas. Digamos muchos en el inglés”. Translation: "Well, I think it is almost similar to what she says because many times we use it to learn a topic that is difficult for us or to understand the topics in our own way of perceiving things. Let's say a lot in English". (Psychology and education student, annex 3, page 102)

“Yo creo que usamos Chat GPT o las demás ideas para contextualizar un poco la situación, digamos, el texto tiene que ser, no sé, nivel C1 en inglés que pues muchos no tenemos, entonces lo que hacemos es decirle a Chat GPT como actúa como una persona con B2, B2 o C1 de inglés y en este contexto, dentro de este contexto, danos tu opinión para, no sé, hacer una tarea o cualquier

cosa, entonces como que lo usamos para que nos dé referencias y para que nos dé como más vocabulario acerca del tema”. Translation: “I think we use Chat GPT or the other ideas to contextualize the situation a little bit, let's say, the text has to be, I don't know, C1 level in English which well many of us don't have, then what we do is tell Chat GPT how it acts like a person with B2, B2 or C1 English and in this context, within this context, give us your opinion to, I don't know, do a task or anything, then we kind of use it to give us references and to give us like more vocabulary about the topic.” (Intercultural education student, annex 3, page 112)

However, autonomy is affected by the use of AI so that pre-service teachers cannot improve or acquire new knowledge to reinforce their skills.

Critical thinking: The use of AI negatively affects the ability of critical thinking, since the information provided by the tool, the pre-service teachers do not verify, adapt, and therefore do not analyze it, likewise the AI is given all the task and the cognitive load, which makes the pre-service teachers decrease the ability to solve problems and think alone in a solution, which causes them to become dependent on the AI to the point of not generating their own ideas.

“Porque, si uno empieza a usar la IA, pues, como muy continuamente, pues va a generar una dependencia en ella. Y después no vamos a tener la capacidad, porque nosotros siempre pensamos las cosas por nosotros mismos, por nuestro propio criterio”. Translation: "Because, if you start using AI, you are going to generate a dependency on it. And then we are not going to have the capacity, because we always think things by ourselves, by our own criteria." (Intercultural education student, annex 3, page 77)

“En el pensamiento crítico sí afecta un montón, porque ya no tenemos nuestro criterio para hablar sobre algo”. Translation: “In critical thinking it does affect a lot, because we no longer have our criteria to talk about something.”(Psychology and education student, annex 3, page 32)

“Creo que propicia mucho al facilísimo y al no generar el pensamiento crítico dentro de las personas, de hecho yo varias veces digo, ya tengo una mera, no quiero pensar más, no quiero hacer nada más, pero si al último el semestre que uno dice nomás, entonces copio y pego, pero uno dice, bueno, puedo copiar esto y pegar (...) pero siento que eso como que ha disminuido un poco la calidad, como el pensamiento y la praxis que debe generar un estudiante durante su desarrollo”. Translation: "I think it is very conducive to facilísimo and not generating critical thinking within people, in fact I often say, I already have a mere, I do not want to think anymore, I do not want to do anything else, but if at the end of the semester you just say, so I copy and paste (..)but I feel that this has diminished a little the quality, like the thinking and praxis that a student should generate during his development". (Psychology and education student, annex 3, page 104)

“De pronto afecta un poco el pensamiento crítico porque los estudiantes empiezan hasta la mínima pregunta a buscar en las inteligencias artificiales en lugar de empezar a pensar, intentar resolver problemas”. Translation: “Suddenly it affects critical thinking a little bit because students start even the smallest question to look to artificial intelligences instead of starting to think, trying to solve problems.” (Intercultural education student, annex 3, page 115)

“O sea, nosotros como estudiantes debemos aprender a usarlas, no a recargarnos en ellas porque eso nos va a hacer dependientes y a largo plazo vamos a dejar de desarrollar habilidades como pensamiento crítico, razonamiento, creatividad,etc “. Translation: “In other words, we as students must learn to use them, not to rely on them because that will make us dependent and in the long-term, we will fail to develop skills such as critical thinking, reasoning, creativity, etc.” (Intercultural education student, annex 3, page 118)

“Sin embargo, tampoco es bueno depender de ella porque si no se está dañando un poco el tema del pensamiento crítico, del análisis, el análisis de texto”. Translation: “However, it is also

not good to depend on it because otherwise you are damaging a little bit the issue of critical thinking, analysis, text analysis.” (Upper intermediate student, annex 3, page 127)

Pre-service teacher interest: Interest has a significant influence on learning content, and is also related to motivation. Pre-service teachers are not interested in subjects such as ethics as they are called boring, besides there are also factors that influence their motivation and interest, which are the methodology used in the classroom to impart knowledge, topics that are not closely related to language learning and finally the age of the teacher along with his teaching style, which tends to be traditional. All of the factors mentioned above influence the excessive use of AI, since it lacks elements such as motivation, which leads to disengagement, general boredom, and misuse, which causes pre-service teachers to use it to quickly get out of their student duties.

“Igual esto ya no es como una opinión personal, siento que hay que ser realistas, porque también uno usa la inteligencia más o menos dependiendo de la clase o la tarea. Porque por ejemplo para, no sé, un trabajo de gran colombianidad, muy pocos van a leer texto y van a hacer el trabajo realmente. A diferencia, por ejemplo, exacto, digamos para una clase de francés, uno lo utiliza como una herramienta para que me explique”. Translation: "This is no longer a personal opinion, I feel that we have to be realistic, because one also uses intelligence more or less depending on the class or the task. Because, for example, for, I don't know, for a big Colombian assignment, very few are going to read the text and actually do the work. Unlike, for example, exactly, let's say for a French class, one uses it as a tool for me to explain." (Intercultural education student, annex 3, page 21)

“Ahorita lo hago, pues, con las materias, la verdad, con las materias que me dan pereza, digamos, no sé. ¿Éticas? Incluso en ética, que a veces encuentro como temas chéveres y como que se puede, como, medio, hacer el esfuerzo de intentar hacerlo sin IA, pero digamos, hay materias

que digo, como, no me gustan, me ahorro leer cosas que no estoy interesada o en lo que no le veo como la gracia, y lo hago. Ya materias más serias como francés, en un momento sí lo hice muchísimo, pero ahorita estoy concientizando que ese proceso lo tengo que hacer todo, porque si no, no voy a aprender". Translation: "Now I do it, well, with the subjects, the truth is, with the subjects that make me lazy, let's say, I don't know. Ethics? Even in ethics, which sometimes I find as cool topics and I can, like, make the effort to try to do it without AI, but let's say, there are subjects that I say, like, I don't like, I save myself from reading things that I'm not interested in or that I don't see the fun in, and I do it. In more serious subjects like French, at one point I did it a lot, but now I am becoming aware that I have to do the whole process, because if not, I will not learn". (Microteaching 1 student, annex 3, page 62)

Moreover, the three instruments demonstrated results and were effective for the collection, categorization and description of information for this research. Subsequently and as a final step, it was decided to make a triangulation with 4 fundamental aspects to take into consideration - objective, instrument, theory, and interpretation-. In the first triangulation, the interpretation is made in response to the objective, which is to know the different perspectives and opinions about the use of AI in pre-service teachers and how this tool has been acquired to their learning process, taking into account how it influences their skills and reinforces their learning needs. In this way, these data were essential to know through surveys and focus groups interview. In the second triangulation, the categorization of the information was primordial to know, identify and give way to the future incidences on the use of AI in the pre-service teachers, through a matrix where different categories were obtained, which were: Lack of time, utility, creativity, second language reinforcement, understanding topics from other subjects, lack of interest in the subjects and demotivation, which were formed thanks to the voices of the pre-service teachers. The third and

last one was the description of the incidences found through the process of identification and interpretation of information given by the pre-service teachers in the management of collecting information, this to finally know the importance of AI in the learning-teaching process, of the same to know which were the negative and positive incidences of categories such as: The time, the use of AI, the creativity, skills reinforcement, critical thinking and the interest, this categorized in a comparative chart, with the final purpose of knowing the functioning of AI in the area of higher education and general educational context, thus its repercussions being positive as well as negative. For more information check above in page 39.

The information was contrasted which helped to have a comprehensive overview regarding the use of artificial intelligence in the learning process of the pre-service teachers, also recognizing the importance of implementing the focus group and the survey to later obtain and confirm the data of the different perceptions and opinions of the pre-service teachers by comparing them with what was initially, the opinions of the professors. The study examines the different experiences of the pre-service teachers of the modern language program of the UGC, regarding the use of AI and also the effects on their academic activities, learning process and even cognitive skills. The matrix helped in the categorization of information to identify the incidences following different patterns and trends that are often the most common among pre-service teachers when using AI.

Conclusions

Most of the pre-service teachers have used and frequent artificial intelligence for their academic activities (Annex 1, page 1), thus contributing significantly to their learning process and management of current technological tools, which are very important today in the field of education. It is evident in general aspects such as skill development through AI, text correction, AI

as a tool that identifies grammatical errors, among many other things. However, many times the use given to it is not adequate, and this generates repercussions in the development of their study and improvement of skills, which the pre-service teacher is conscious, for example about the incorrect implementation that generates dependency, discipline or effort is not exercised in carrying out tasks and the ability to think for oneself is lost similarly that the easy way out is extended.

It is for these features, as well as many others, that the research identified the different causes that generate this bad use and that have a negative impact, such as dependence on the tool, which is the most usual together with the excessive use, which is caused by lack of time, laziness, motivation of the area or subject to learn or the knowledge about the same AI and the different functions it offers, which has also encouraged practices such as copy paste, and frequent errors due to the veracity of the sources of information. This not only affects the pre-service teacher's capacity for analysis but also their own learning style, as reflected in the work they produce or academic activities, likewise the creation even of their own ideas since they are not originating from themselves but from the AI, which considerably affects the critical thinking of the pre-service teachers. This has transformed the perception of the instrument as something unfavorable and questionable, that is why some of the pre-service teachers prefer not to opt for its use or frequent it as much, since they know that it can affect their autonomy, creativity and cognitive skills such as critical thinking, as mentioned above. In comparison, pre-service teachers also recognize that using it brings several benefits and more in this field of new language acquisition such as being able to better optimize their study time, learn new vocabulary, reinforce skills such as writing along with reading (Annex 1, page 2) or to reinforce grammatical structures, this also generates that pre-service teachers have autonomy over their learning and, it is easier to acquire and interpret the information.

In relation to the above, it is also highlighted the three objectives of this research, these were key to discover the incidences since their structure was consequent to find and collect the requested information. Thanks to the interviews conducted with the professors of the faculty of modern languages, there was a better understanding of the challenges facing the use of AI in higher education and in the process of training future teachers. On the other hand, identifying the use of AI by pre-service teachers through interviews and focus groups was very important because it allowed us to learn about lived experiences, real or sincere opinions that clarify the implications, advantages, disadvantages and other essential elements for this study, which contributed to create, classify and categorize in a matrix, in that order finalize in a comparative chart which were the incidences of the implementation of AI by pre-service teachers. Furthermore, in each reality of each pre-service teacher there is a reason for the use of AI, and at the same time a knowledge and perception of it, so it was discovered that many prefer to use it, whether in moderation or not, and others do not prefer it so as not to interfere their learning process in a negative way because they are aware that there is a lack of training on it, so it is not generalized that all pre-service teachers know how to use the diverse artificial intelligences and do not know their possible uses.

According to the information presented, this study describes the impact of AI on pre-service teachers in order to clarify the real influence of its use in higher education, or university, specifically in the modern languages program of the UGC. Therefore, the researchers conclude that it is important to know how this tool is used inside and outside the classroom, how it influences its perception or stigmatization in the educational context, that is, whether it is a good tool that optimizes learning effectively or not, and how pre-service teachers are aware of its regulated application since it can affect their learning process and everything that conforms it as the acquisition of new skills, including its improvement. Additionally, there are many trends and

patterns that are repetitive which were identified through this study, thanks to the surveys and interviews conducted that opened a broad overview of what are the incidences, such as using artificial intelligence to get out of the task, because the topic is not of interest and even the motivation to make a search process or analyze the complexity of a problem, which in the end will be solved by artificial intelligence so it is these elements and many others that were found around the research that should be worked in depth to find different variables or suitable alternatives that work to break the paradigm that only encourages the easy and minimal effort, because on the contrary, it is a fact that there are different artificial intelligences today for diverse educational needs and for specific purposes or objectives, which bring many benefits to learning and education in general, which is becoming more innovative thanks to the use of new technologies.

Recommendations

This research proposes a set of recommendations based on the findings and conclusions of the incidences of the use of AI in the pre-service teachers of the Modern Languages Program at the UGC. The recommendations are important to create awareness of the use of artificial intelligence, to encourage its proper use and application in academic activities, and likewise to recognize its multiple benefits so that it does not negatively impact on the learning process. The following recommendations integrate fundamental components to address this phenomenon:

1. Create seminars or lectures within the universities to train pre-service teachers and professors of the institutions on how to use artificial intelligence in the appropriate way, and at the same time explore what types of intelligent platforms exist to help optimize educational processes.

2. Encourage the use of artificial intelligence integrating the practice on the side of the professors in the different subjects of the curriculum of the Modern Languages program.
3. It is recommended to create accompaniment by teachers to students in their academic assignments, since sometimes students are left with doubts about the subject and tend to repetitively use AI to clarify them, which in the long term generates dependence.

Recommendations for future researches

It is fundamental for future investigations to create spaces where students can talk openly about their experiences and personal opinions, since in order to collect information real data is essential, many times virtual surveys prevent this honest information, so it is recommended that the researcher create environments where they can talk face to face with the students and create a natural conversation to obtain the required information.

It is recommended to broaden the range of research to elementary and middle school level, because just as the use of AI influences in higher educational contexts, the use of AI can be interposed in the same way in lower educational levels, so it is optimal to study these fields as well.

Implementing these recommendations at the Universidad La Gran Colombia and in future studies, could promote a better use and utilization of artificial intelligence and in the meantime, it could be used as a strategic tool to help in the teaching-learning processes.

REFERENCES

- Alvarado, L. y García, M. (2008). Características más relevantes del paradigma sociocrítico. Su aplicación en investigaciones de educación ambiental y de enseñanza de las ciencias realizadas en el Doctorado de Educación del Instituto Pedagógico de Caracas. *Revista Universitaria de Investigación*, 9(2), 187-202.
<https://www.redalyc.org/pdf/410/41011837011.pdf>
- Angulo, A. M. (2011). La Pensión de Invalidez en Colombia. La Pensión de Invalidez en Colombia. Bogotá D.C., Cundinamarca., Colombia.: Universidad Libre de Colombia.
- Asamblea Nacional Constituyente de Francia. (26 de agosto de 1789). Declaración Universal de los Derechos del Hombre y del Ciudadano. https://www.conseil-constitutionnel.fr/sites/default/files/as/root/bank_mm/espagnol/es_ddhc.pdf
- Bedoya Villa, D., Pinto, N. J., Ramirez Villegas, Y. N., & Zarate Escorcia, J. M. (2024). Percepciones, desafíos y beneficios de la inteligencia artificial en la educación superior.
<https://repositorio.unbosque.edu.co/items/45cb19ee-d938-448f-9f6e-a8bd0e397df2>
- Bravo, L. O. G., Pesantez, P. R. A., Fray, L. F. B., & León, A. E. M. (2024). La inteligencia artificial aplicada a la enseñanza del idioma inglés como lengua extranjera. *Polo del Conocimiento*, 9(8), 2791-2806.
<https://polodelconocimiento.com/ojs/index.php/es/article/view/7854>
- Buchanan, B. G. (2005). A (Very) Brief History of Artificial Intelligence. *AI Magazine*, 26(4), 53-60. <https://doi.org/10.1609/aimag.v26i4.1848>
- Chen, L., Chen, P., & Lin, Z. (2020). Artificial Intelligence in Education: A Review. *IEEE Access*, 8, 75264-75278. <https://doi.org/10.1109/ACCESS.2020.2988510>

Constitución política de Colombia [Const. P.]. (1991). Colombia: Leyer, 2.da ed. 10/02/2020.

http://www.secretariassenado.gov.co/senado/basedoc/constitucion_politica_1991.html

Corte Constitucional [C.C.], enero 22, 2004, M.P: M. Cepeda. Sentencia T-025/04. Colombia.

10/02/2020. <https://www.corteconstitucional.gov.co/relatoria/2004/t-025-04.htm>

Corte Constitucional [C.C.], enero 23, 2008, M.P: R. Escobar. Sentencia C-030/08. Colombia.

10/02/2020. <https://www.corteconstitucional.gov.co/relatoria/2008/c-030-08.htm>

Creswell, J. W. (2013). Qualitative inquiry and research design: Choosing among five approaches

(3rd ed.). SAGE. <https://revistapsicologia.org/public/formato/cuali2.pdf>

de la Cruz, J. P. C., García, A. E. P., Cárdenas, J. E. C., & Gómez, L. M. P. (2024). Impacto de la inteligencia artificial en la Institución Universitaria Americana en la ciudad de

Barranquilla. Ad-Gnosis,

13(13).<https://publicaciones.americana.edu.co/index.php/adgnosis/article/view/667>

Dec. 2374 / 93, noviembre 30, 1993. Ministerio de Educación Nacional. (Colombia). 10/02/2020.

https://www.mineducacion.gov.co/1621/articles-104283_archivo_pdf.pdf

Dec. 2613 / 13, noviembre 20, 2013. Ministerio del Interior. (Colombia). 10/02/2020.

https://www.mininterior.gov.co/sites/default/files/11_decreto_2613_de_2013.pdf

Dewey, J. (2001). Democracia y educación: Una introducción a la filosofía de la educación.

Macmillan. <https://archive.org/details/DeweyJohnDemocraciaYEducacion>

Díaz Ramírez, M., & Díaz Ramírez, M. (2024). La organización de experiencias en la

incorporación de la Inteligencia Artificial en el contexto de la enseñanza y aprendizaje del idioma inglés: un enfoque sistemático. Revista Grupo Cielo (65).

<https://revista.grupociieg.org/wp-content/uploads/2024/01/Ed.6586-100-Diaz-y-Diaz.pdf>

Díaz, B., & Nussbaum, M. (2024). Artificial intelligence for teaching and learning in schools:

The need for pedagogical intelligence. *Computers & Education*, 217, 1–19.

<https://doi.org/10.1016/j.compedu.2024.105071>

Ellis, R. (2008). *The Study of Second Language Acquisition* (2.^a ed.). Oxford University Press.

https://www.researchgate.net/publication/276187001_R_Ellis_The_study_of_second_language_acquisition

Enciso, O. L. U., Enciso, D. S. U., & Daza, M. D. P. V. (2017). Critical thinking and its importance in education: Some reflections. *Rastros Rostros*, 19(34), 78-88.

<https://dialnet.unirioja.es/servlet/articulo?codigo=6975444>

Fitria, T. N. (2021). The use technology based on artificial intelligence in English teaching and

learning. *ELT Echo: The Journal of English Language Teaching in Foreign Language*

Context, 6(2), 213-223. [https://www.researchgate.net/profile/Tira-Nur-](https://www.researchgate.net/profile/Tira-Nur-Fitria/publication/358746284_The_Use_Technology_Based_on_Artificial_Intelligence_in_English_Teaching_and_Learning/links/62138758eb735c508ae75db3/The-Use-Technology-Based-on-Artificial-Intelligence-in-English-Teaching-and-Learning.pdf)

[Fitria/publication/358746284_The_Use_Technology_Based_on_Artificial_Intelligence_in_English_Teaching_and_Learning/links/62138758eb735c508ae75db3/The-Use-](https://www.researchgate.net/profile/Tira-Nur-Fitria/publication/358746284_The_Use_Technology_Based_on_Artificial_Intelligence_in_English_Teaching_and_Learning/links/62138758eb735c508ae75db3/The-Use-Technology-Based-on-Artificial-Intelligence-in-English-Teaching-and-Learning.pdf)

[Technology-Based-on-Artificial-Intelligence-in-English-Teaching-and-Learning.pdf](https://www.researchgate.net/profile/Tira-Nur-Fitria/publication/358746284_The_Use_Technology_Based_on_Artificial_Intelligence_in_English_Teaching_and_Learning/links/62138758eb735c508ae75db3/The-Use-Technology-Based-on-Artificial-Intelligence-in-English-Teaching-and-Learning.pdf)

Flores, N., & Saldívar García, E. (2023). Authority over power in English learner accountability

policies: Maintaining a national role within a context of local control. *Education Policy*

Analysis Archives, 31(46). <https://doi.org/10.14507/epaa.31.6479>

García, A., & Morcillo, J. M. (2019). Inteligencia artificial en educación: Retos y oportunidades

para un desarrollo sostenible. *Comunicar*, 27(74), 13-23.

<https://www.revistacomunicar.com/pdf/74/c7403es.pdf>

Hao, Z., Fang, F., & Peng, J. E. (2024). The integration of AI technology and critical thinking in

English major education in China: Opportunities, challenges, and future prospects. *Digital*

- Applied Linguistics, 1, 2256-2256.
<https://www.castledown.com/journals/dal/article/view/dal.v1.2256/763>
- Hernández, J. C. E. (2021). La Inteligencia Artificial y la Enseñanza de Lenguas: una aproximación al tema. *Decires*, 21(25), 29-44.
<https://doi.org/10.22201/cepe.14059134e.2021.21.25.3>
- Huerta-Presa, S., & Zavala-Ramírez, J. (2023). La Inteligencia Artificial y el Contexto de la Docencia en México. *Revista Tecnológica-Educativa Docentes 2.0*, 16(1), 49-56.
<https://doi.org/10.37843/rted.v16i1.336>
- Ley 70 / 93, agosto 27, 1993. Diario Oficial. [D.O.]: 41.013. (Colombia).10/02/2020.
<https://www.acnur.org/fileadmin/Documentos/BDL/2006/4404.pdf?file=fileadmin/Documentos/BDL/2006/4404>
- Ley 89 / 90, noviembre 25, 1890. Ministerio de Interior. [OIPi]. (Colombia).10/02/2020.
<https://www.mininterior.gov.co/la-institucion/normatividad/ley-89-de-1890>
- Luckin, R. 2017. Towards artificial intelligence-based assessment systems. *Nat Hum Behav* 1, 0028.https://www.researchgate.net/publication/314088884_Towards_artificial_intelligence_e-based_assessment_systems
- Maximiano, J., & Navarro Guaimares. (2024). Pensamiento crítico Vs inteligencia artificial, un desafío para la educación. *Orinoco. Pensamiento y Praxis*, 14(2), 17-36.
<https://portal.issn.org/resource/ISSN-L/3006-8827>
- Morales Zúñiga, L. C. (2014). El pensamiento crítico en la teoría educativa contemporánea. *Actualidades investigativas en educación*, 14(2), 591-615.
<https://www.scielo.sa.cr/pdf/aie/v14n2/a20v14n2.pdf>

Mosqueda Chávez, E. (2024). La inteligencia artificial como aliada del aprendizaje y el pensamiento crítico. *Revista Mexicana De Bachillerato a Distancia*, 16(32).

<https://doi.org/10.22201/cuaieed.20074751e.2024.32.89555>

Naciones Unidas Derechos Humanos. (diciembre, 1965). Convención Internacional sobre la Eliminación de todas las Formas de Discriminación Racial. Trabajo presentado en la Asamblea General en su resolución 2106 A (XX). Colombia.

https://www.ohchr.org/Documents/ProfessionalInterest/cerd_SP.pdf

Nor, H. M., & Sihes, A. J. (2021). Critical thinking skills in education: A systematic literature review. *International Journal of Academic Research in Business and Social Sciences*, 11(11), 198-201. https://kwpublications.com/papers_submitted/14449/critical-thinking-skills-in-education-a-systematic-literature-review.pdf

Numa-Sanjuán, N., Diaz-Guecha, L. Y., & Peñaloza-Tarazona, M. E. (2024). Importancia de la Inteligencia Artificial en la educación del siglo XXI. *AiBi Revista De Investigación, Administración E Ingeniería*, 12(2), 49–62. <https://doi.org/10.15649/2346030X.3776>

OECD. (2019). TALIS 2018 results (Volume I): Teachers and school leaders as lifelong learners. OECD Publishing. https://www.oecd.org/en/publications/talis-2018-results-volume-i_1d0bc92a-en.html

Ordoñez García, S., Padilla Romero, L. E., Buenaño Barrionuevo, L. A., & Herrera Valdivieso, M. V. (2023). Impacto de la inteligencia artificial en la formación del docente para la educación superior. *RECIAMUC*, 7(1), 45-62.

<https://reciamuc.com/index.php/RECIAMUC/article/view/1261>

Organización de los Estados Americanos. (1994). Convención Interamericana para prevenir, sancionar y erradicar la violencia contra la mujer. Trabajo presentado en la Organización

de los Estados Americanos Departamento de Derecho Internacional, Belém.

<https://www.oas.org/es/mesecvi/convencion.asp>

Organización de los Estados Americanos. (noviembre, 1969). Convención americana sobre derechos humanos suscrita en la conferencia especializada interamericana sobre derechos humanos (B-32). Trabajo presentado en la Organización de los Estados Americanos Departamento de Derecho Internacional, Costa Rica.

https://www.oas.org/dil/esp/tratados_b-

[32_convencion_americana_sobre_derechos_humanos.htm](https://www.oas.org/dil/esp/tratados_b-32_convencion_americana_sobre_derechos_humanos.htm)

Ormrod, J. E. (2008). Human Learning (5.^a ed.). Pearson/Merrill Prentice Hall.

https://books.google.com.co/books/about/Human_Learning.html?id=3XsrAQAAMAAJ&redir_esc=y

Paul, R., & Elder, L. (2003). La mini-guía para el pensamiento crítico, conceptos y herramientas (p. 26). Dillon Beach, California: Fundación para el pensamiento crítico.

<https://didacticadelaeducacionsuperioruacj.wordpress.com/wp-content/uploads/2017/05/guc3aca-para-el-pensamiento-crc3actico.pdf>

Piaget, J. (1950). The Psychology of Intelligence (M. Piercy & D. E. Berlyne, Trans.). Routledge.

<https://doi.org/10.4324/9780203164730>

Presidente de la Republica. (2010). Garantía del derecho fundamental a la consulta previa de los grupos étnicos nacionales. Directiva Presidencial no. 1 (p.1–7). Colombia. Recuperado de https://www.mininterior.gov.co/sites/default/files/13_directiva_presidencial_01_de_2010.pdf

Presidente de la Republica. (2013). Guía para la realización de consulta previa. Directiva Presidencial no. 10 (p.1–26). Colombia.

- https://www.mininterior.gov.co/sites/default/files/12_directiva_presidencial_ndeg_10_del_07_de_noviembre_2013_4.pdf
- Quijano García, J. E. (2024). Desarrollo de un modelo de evaluación para medir el impacto de las herramientas generativas de texto basadas en inteligencia artificial en la educación superior. <https://repository.universidadean.edu.co/server/api/core/bitstreams/8b99e942-abd1-4395-a271-520a72928d61/content>
- Rahm, L., & Rahm-Skågeby, J. (2023). Imaginaries and problematisations: A heuristic lens in the age of artificial intelligence in education. *British Journal of Educational Technology*. <https://bera-journals.onlinelibrary.wiley.com/doi/epdf/10.1111/bjet.13319>
- Rai, D. H. (2024). Artificial Intelligence Through Time: A Comprehensive Historical Review. Tribhuvan University, Institute of Science and Technology. Recuperado de https://www.researchgate.net/profile/Dilli-Hang-Rai/publication/385939923_Artificial_Intelligence_Through_Time_A_Comprehensive_Historical_Review/links/676fb15600aa3770e0c2516f/Artificial-Intelligence
- Rentería García, C. D. (2023). El impacto de la Inteligencia Artificial en la Educación Superior: representaciones sociales y transformación institucional. *Revista de Tecnología, Innovación y Educación Superior (TIES)*, 9(2), 23-41. <https://www.ties.unam.mx/index.php/ties/article/view/47>
- Ricoy, C. (2006). Contribución sobre los paradigmas de investigación. *Revista do Centro de Educação*, 11-22. <https://www.ride.org.mx/index.php/RIDE/article/view/717>
- Rivera, J., & Álvarez, J. (2024). Implicaciones de la inteligencia artificial (IA) en la educación para mejorar la calidad del aprendizaje [Proyecto de investigación]. Universidad Libre. <https://repository.unilibre.edu.co/bitstream/handle/10901/29284/Implicaciones%20de%20>

[la%20Inteligencia%20Artificial%20%28IA%29%20en%20la%20Educaci%C3%B3n%20para%20Mejorar%20la%20Calidad%20del%20Aprendizaje.pdf?sequence=2](#)

Rivero Panaqué, Carol; Beltrán Castañón, César La inteligencia artificial en la educación del siglo XXI: avances, desafíos y oportunidades Presentación Educación, vol. 33, núm. 64, 2024, Enero-Junio, pp. 5-7

<https://www.redalyc.org/journal/7178/717877776001/717877776001.pdf>

Rodríguez Mesa, R. (2019). Tratado Sobre Seguridad Social. Universidad Del Norte.

<https://Ugc.Elogim.Com:3107/Es/Ereader/Ugc/122380?Page=64>

Rouhiainen, L. (2018). Inteligencia artificial: 101 cosas que debes saber hoy sobre nuestro futuro. Ediciones Gestión 2000. Recuperado de

[https://planetadelibrosar0.cdnstatics.com/libros_contenido_extra/40/39307_Inteligencia a rtficial.pdf](https://planetadelibrosar0.cdnstatics.com/libros_contenido_extra/40/39307_Inteligencia_a_rtficial.pdf)

Sanabria-Navarro, J. R., Silveira-Pérez, Y., Pérez-Bravo, D. D., & de-Jesús-Cortina-Núñez, M. (2023). Incidencias de la inteligencia artificial en la educación contemporánea.

Comunicar: Revista Científica de Comunicación y Educación, 31(77), 97-107.

<https://www.revistacomunicar.com/index.php?contenido=detalles&numero=77&articulo=77-2023-08>

Slavov, V., Yotovska, K., & Asenova, A. (2023). Research on the Attitudes of High School Students for the Application of Artificial Intelligence in Education. International Association for Development of the Information Society.

<https://eric.ed.gov/?id=ED639549>

Svoboda, P. (2024). Digital Competencies and Artificial Intelligence for Education:

Transformation of the Education System. International Advances in Economic Research, 1-4. <https://link.springer.com/article/10.1007/s11294-024-09896-z>

Swaraj, A. (2019). Exploratory research: Purpose and process. Parisheelan, 15(2), 665–670.

https://www.academia.edu/106365830/Exploratory_Research_Purpose_And_Process

Tafur, A. T. V., & Molina, R. E. F. (2023). Incidencia de la Inteligencia Artificial en la educación. Educatio Siglo XXI, 41(3), 235-264.

<https://revistas.um.es/educatio/article/view/555681>

Thornhill-Miller, B., Camarda, A., Mercier, M., Burkhardt, J. M., Morisseau, T., Bourgeois-

Bougrine, S., ... & Lubart, T. (2023). Creativity, critical thinking, communication, and collaboration: assessment, certification, and promotion of 21st century skills for the future of work and education. Journal of Intelligence, 11(3), 54. <https://www.mdpi.com/2079-3200/11/3/54?ref=blog.joinwimzee.com>

United Nations Educational, Scientific and Cultural Organization (Ed.). (2019). Artificial intelligence in education: Challenges and opportunities for sustainable development.
<https://www.revistacomunicar.com/pdf/74/c7403es.pdf>

United Nations Educational, Scientific and Cultural Organization (2021). Reimaginar juntos nuestros futuros: Un nuevo contrato social para la educación.

<https://unesdoc.unesco.org/ark:/48223/pf0000376709>

Vanzeto, J. J., & Rodríguez, P. M. (s.f.). Inteligencia Artificial: Una visión propedéutica.

Recuperado de

<https://pallotti.com.br/storage/424/01J8GBRHZAPVYF6ZKZ5VJW8GY7.pdf>

Velásquez, M, (2007). El Sistema Pensional Colombiano. Señal Editora. Medellín Colombia.

Vygotsky, L. S. (1978). *Mind in Society: The Development of Higher Psychological Processes*

(M. Cole, V. John-Steiner, S. Scribner, & E. Souberman, Eds.; A. R. Luria, M. Lopez-Morillas, & M. Cole, Trans.). Harvard University Press.

<https://archive.org/details/mindinsocietydev00vygo>

Walter, Y. (2024). Embracing the future of Artificial Intelligence in the classroom: the relevance of AI literacy, prompt engineering, and critical thinking in modern education.

International Journal of Educational Technology in Higher Education, 21(1), 15.

<https://link.springer.com/article/10.1186/s41239-024-00448-3>

Zhai, X., Chu, X., & Wang, M. (2021). A review of artificial intelligence (AI) in education from 2010 to 2020. *Journal of Educational Technology Development and Exchange*, 14(1), 39–54. <https://onlinelibrary.wiley.com/doi/10.1155/2021/8812542>

Zhang, C., Schießl, J., Plöbl, L. et al. Acceptance of artificial intelligence among pre-service teachers: a multigroup analysis. *Int J Educ Technol High Educ* 20, 49 (2023).

<https://doi.org/10.1186/s41239-023-00420-7>