

Implementation of Artificial Intelligence as an Educational Resource

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Abstract

Artificial intelligence is a discipline that currently plays an important role in society, taking over multiple scenarios, it is projected as an invention that aims to mimic the skills of human beings. In educational environments, it has managed to enter with relevance, it is shown as an alternative to reduce the time of teachers and have a better monitoring of students. The purpose of this article is to analyze the implementation of artificial intelligence in the educational system of the Ernesto Vera Cedeño Educational Unit of Rocafuerte canton, Manabí, Ecuador. The research used a non-experimental descriptive methodology, with a mixed approach, taking as an instrument the survey that was applied to 30 teachers, who were selected through a non-probabilistic sampling where the inclusion criteria consisted of: being a volunteer and having more than 2 years in the educational institution Ernesto Vera Cedeño, finally a review of scientific documents was made, such as: texts, book chapters, articles, theses and documents with reliability information. The results reveal that artificial intelligence is applied in many aspects of the educational environment, providing virtual tutoring, individualized feedback, computing, student tracking, detailed reports, simpler planning, preparation and grading of questionnaires to a greater number of students, and enhancing creativity through robotics, among others. Likewise, it is important to take into account ethical considerations in order not to fall into dependence or loss of interaction skills.

Keywords: learning, Artificial Intelligence, educational system, technology, robotics.

INTRODUCTION

Due to growing technological advances, the media day by day present new creations, among them is Artificial Intelligence, in its beginnings its only mission was to simulate skills or activities carried out by human beings. However, currently its functions are several, among them is the great role that artificial intelligence (AI) has in education.

According to Vera, AI is increasingly used in education, because it offers a host of possibilities that improve teaching and reduce time for teachers. However, every invention always presents two positions, where there are those who consider that AI is here to stay in the educational field, and, on the other hand, those who consider that technology should not be mixed with education.(2023)

The objective of this work is to determine the implementation of AI in the educational environment of a public school. This research problem is of vital importance, because several researchers and psychologists propose that education should be seen from a holistic approach, that is, that there should be no barriers that prevent correct learning, so that each student learns differently and several statistical figures indicate that several students consider that AI has provided a didactic learning methodology.

This is supported by Peñaherrera et al., who highlight that artificial intelligence offers multiple options where the student can know which application allows him to learn more productively. In this way, it makes learning easier, thus reinforcing the knowledge acquired in the classroom.(2022)

Artificial Intelligence must be understood as a discipline that provides the opportunity to solve problems in an anticipated and effective way. Wang believes that this adaptability allowed him to get involved in educational institutions, through virtual tutors who provide them with support in more complex activities. For this reason, several institutions are considering using AI in their educational plans from initial education to higher education.(2018)

Types of Artificial Intelligence machines

Talking about AI is something macro, so it is important to know that, in AI, according to García, there are different technological tools, including machines with a super memory, by immediate reaction, designed according to the human mind and even those that have their own consciousness.(2019)

Based on García, this type of machine can be defined as follows:(2019)

- Reactive machines: they are the most basic and for which Artificial Intelligence became known, in these machines the capacity is limited so they are only able to give a response because they have been programmed with said automatic response.
- Machines with limited memory: they emerged after reactive machines, and unlike the first, their capacity is a little greater so they can learn and act on something because they have been trained, in this case autonomous vehicles are included.
- Machines based on theory of mind: currently it is only as a project, because they will be able to learn something through experience and through this they will know how to react when it comes up again.
- Machines with their own awareness: they are those that will be able to detect emotions and feelings, so it will be the closest thing to a human being, currently the closest thing is a robot called Sofia that imitates gestures and responds according to what is requested, even having a conversation.

Contributions to the educational environment

AI is one of the best inventions according to the opinion of some theorists; Moreno believes that the arrival of AI reinvented the perspective of education, it is thanks to this creation that the most distant communities have been able to shorten the inequality gap in education with chatbots and self-learning platforms these users have been able to acquire greater knowledge.(2019)

However, it is important to bear in mind that one of the most complex areas is education, which is considered to be the area that allows the acquisition of information and skills. In this process for some students it is very complex to understand the tasks, because in the classrooms of educational institutions in Ecuador the number of students is very large and personalized attention cannot be provided, it is here where Del Mastro considers that Artificial Intelligence is a support that allows teachers to provide solutions, serving as reinforcers in this learning. (2003)

However, Artificial Intelligence goes far beyond simply being a tutor, several studies have shown that currently AI allows teachers to reduce the grading time in the evaluations and monitoring of each student, according to Ronquillo, one of the greatest contributions of Artificial Intelligence is to evaluate large volumes of data in a short time, allowing teachers to take virtual questionnaires with greater security.(2023)

Along the same lines, Gómez states that Artificial Intelligence is implemented by teachers in order to save time and for the individualized service it provides to students, where through a didactic methodology, the user can learn from their learning style, adapting it to their needs. Artificial Intelligence allows identifying weaknesses and strengths of each student, so that a personalized intervention is provided achieving better learning. From this vision, the academy considers that the virtual tutoring system is one of the ones that provide the most positive results, managing to solve more complex concepts and at the pace of each student. (2023)(Tecnológico de Monterrey, 2014)

Regarding the field of educational monitoring, Parra indicates that Artificial Intelligence has made it possible to deepen the progress of students, reaching everyone equally, a more detailed report can be obtained even with graphs of the student's performance, showing the strengths and weaknesses, providing the teacher with essential information on the topics to be reinforced in the classroom. (2022)

Among the implementations of AI in education, they can be grouped as follows:

- Virtual tutoring and automated feedback: virtual assistants have undoubtedly been one of the greatest contributions, allowing interaction with students, responding or solving concerns in a simple way, unlike the human being, a virtual device can work 24 hours a day. According to Ospina, thanks to AI, knowledge can be reinforced, which allows transformation in education, receiving individualized support. It is important to know that, unlike Google, with Artificial Intelligence, virtual tutoring is more didactic, because it works through interaction, as if it were with an individual. (2021)

- Educational Robotics: in education it is one of the most used inventions, according to González, because it strengthens the creativity of students, allowing theoretical learning to be reinforced through practice. In addition, it allows students to learn to create devices that work through physical laws, by using this AI invention, the student is given an approach to careers such as mechanics, electrical engineering, physics and computer sciences. (2011)

Similarly, there is the usefulness of Artificial Intelligence by teachers, according to Ocaña considers that teachers make use of AI, in the following activities:(2019)

- Collaboration in teaching tasks: Artificial Intelligence allows teachers to more easily carry out the process of recording activities, preparing reports, recognizing strengths and weaknesses of each student, supervising tasks through a virtual application, conducting virtual tests with open questions that are graded through AI, to be able to recognize plagiarism in educational work. In addition, it allows for detailed planning for the teacher, so that they can have an organization of their courses, even in higher educational degrees, AI allows truthful information to be obtained for research work.

Limitations faced by Artificial Intelligence in Educational Institutions

Once the contributions of AI to the educational system have been understood, it is necessary to know the other side of this invention, where it is necessary to apply professional ethics, for this it is necessary to understand that artificial intelligence, according to Lobo, is a computer discipline that aims to imitate the skills of the human being, in order to make things easier for people. saving quality time. (2019)

However, it is this same purpose that makes teachers afraid, because they wonder if this invention will ever replace them. However, Lucena believes that, although there is this fear due to the flexibility of AI, it must be understood that it is almost impossible for an invention to replace the empathy and feelings of a human being. Many researchers indicate that more advanced robots may be created in the future. (2019)

Undoubtedly, AI faces many barriers that it must break down to be fully accepted in educational institutions, another of the impediments to its acceptance, is raised by Chassignol, who highlights the excessive dependence that AI can generate, which although it is very important can also cross the line of excess and cause the student to only dedicate himself to obtaining answers from AI. leaving aside the use of their executive functions, hindering the student from solving problems autonomously. (2018)

Similarly, the teachers highlight the fear that Artificial Intelligence, being something technological, has flaws, including those highlighted by Jara, where there is a fear that student data will be disseminated, breaking privacy and security, without neglecting that there may be discrimination between students virtually, with AI being a facilitator of inequality or exclusion. (2020)

It is understandable that there is fear on the part of teachers, in the face of a new fact, because ethically AI, being a technological discipline, calls into question certain aspects that are of great relevance in education.

METHODOLOGY

The descriptive non-experimental design was used, which, according to Rubeira, "represents the systematic mechanism through which scientists and researchers can obtain conclusions about the hypotheses raised in the different projects" (p. 20).(2008)

It has a mixed approach, since the variables were conceptualized and graphed, according to Hernández et al., bearing in mind that this approach embraces and combines the strengths, both qualitative and quantitative, to achieve the purpose of the research, without paying attention to weaknesses. (2014)

The survey was used as an instrument, Archenti defines it as a technique that through some questioning manages to investigate data of great relevance to a certain certain group.(2012)

A non-probabilistic sample was applied, where the inclusion criteria were: to be a volunteer and to have more than 2 years in the educational campus, through these parameters the sample was 30 teachers from the Ernesto Vera Cedeño Fiscal Educational Unit, in the Rocafuerte canton.

The combination of inductive, deductive and descriptive methods was also used. Multiple data sources were used to make the research a reliable subject that was fully covered; this included a documentary review of primary sources of information such as

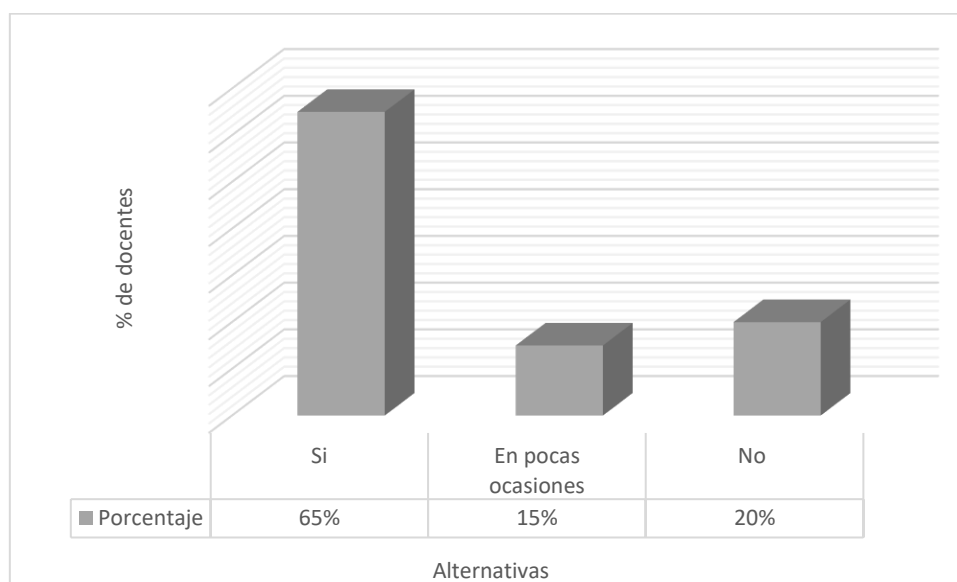
scientific articles, books, book chapters and documentation such as editorials on websites, postgraduate theses and the like, referring to the use of AI in education.

RESULTS

The growth of students has led to the need to use other strategies, so this represents a great challenge for the population worldwide, and given this fact, an alternative that offers multiple advantages in different areas is AI, especially in education, representing, perhaps, one of the best inventions that have been launched into the world and that is the work of human beings.

The work presented is of vital importance given the issue of Artificial Intelligence in education and its environment; developed through the bibliographic review of secondary sources, in which important points about the implementation of Artificial Intelligence and the barriers that prevent it from being fully inserted in educational institutions were analyzed. Therefore, most teachers in institutions in Ecuador and other countries make use of the contributions of Artificial Intelligence, managing to streamline processes in the planning and monitoring of students. In the same way, there are teachers who consider that a limit should be set when using AI, because they can fall into dependency and affect the student's social and emotional skills.

As a result of the survey technique that was applied to the teachers of the educational unit, it was asked if they currently make use of Artificial Intelligence in the educational institution they work for, in graph 1 the results are shown.



Graph 1

Use of artificial intelligence by the teachers of the campus

Note. Result of the questionnaire carried out to the professors of the U.E. Ernesto Vera Cedeño. Own elaboration. In original language Spanish

The first graph highlights that currently a large part of the teachers of the educational establishments implement Artificial Intelligence in their work, because it is a tool that has given them speed in larger groups, thus allowing better learning. In addition, it should be noted that some teachers who answered negatively were unaware of this technological tool.

To deepen the research topic, the teachers were asked how they implemented Artificial Intelligence in their profession, obtaining the following results.

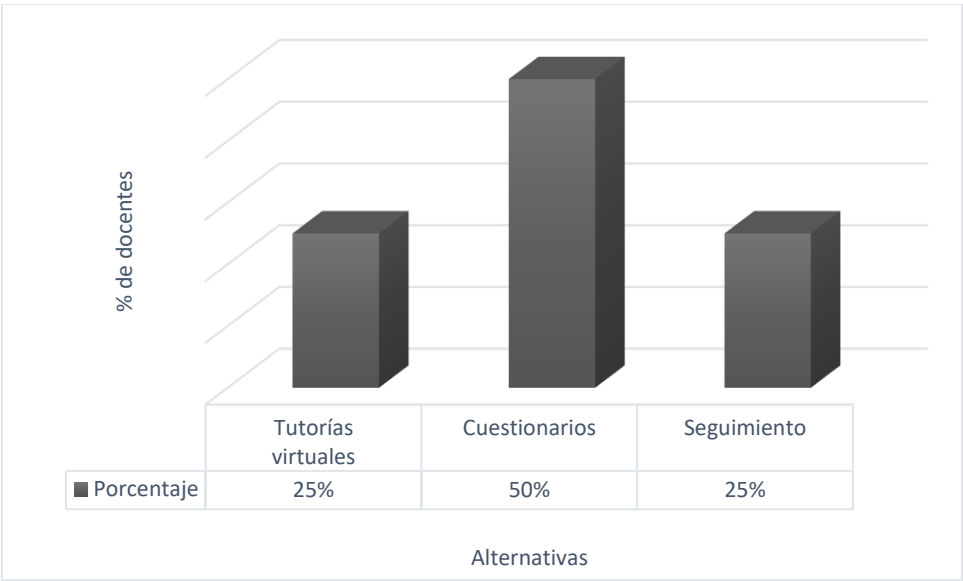


Figure 2

AI Utilities

Note. Utilities of AI for the teachers of the Ernesto Vera Cedeño Educational Institution. Own elaboration. In original language Spanish

Graph 2 allows us to have a clearer vision, highlighting that Artificial Intelligence has provided multiple uses and detailing how AI has filtered into the educational field, in this case teachers consider that conducting questionnaires virtually for a large group of students is a great tool, because its grading is automatic and in less time. in the same way, it is highlighted that both virtual tutorials and the monitoring of students by AI have high statistical figures, which shows that all these functions are relevant for teachers.

The importance of the implementation of AI, and given the fear of some teachers for this tool, they were asked if they consider that Artificial Intelligence as an educational resource is totally safe, in the following graph the results are observed.

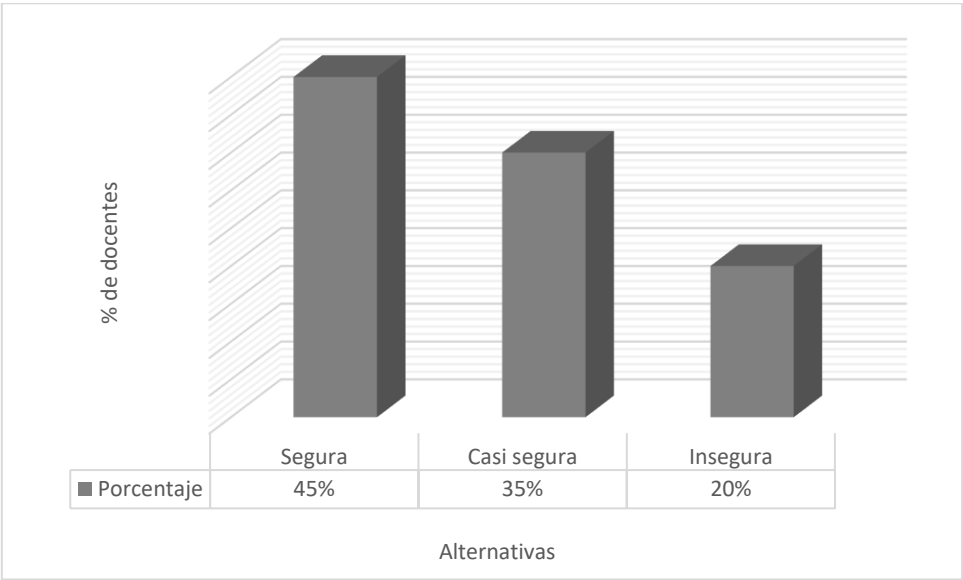


Figure 3

Artificial intelligence security level for campus teachers

Note. Result of the perception of safety in applying AI in educational environments of the teaching staff of the U.E. Ernesto Vera Cedeño. Own elaboration. In original language Spanish

In this graph, teachers consider that despite the fact that Artificial Intelligence has emerged as a support in the educational field, they also state that, being created by technology, there is a fear that in the event of an error, all student information will be dispersed and made public. Of these results, 45% of the teachers to whom the survey was applied report that AI is safe to use, while 35% consider it almost safe, while 20% describe it as unsafe. It can be seen that teachers have a certain suspicion with AI so they do not use it for data that is exclusive, due to the above. There is a considerable number of teachers who indicate that AI is not safe in the education sector, this may be due to a lack of knowledge in technological topics.

According to several bibliographic documents, it indicates that students who are in educational institutions that make use of AI show that they learn more effectively, increasing students' creativity and being more motivated to participate in the activities of the educational environment. Some teachers have suggested that subjects related to artificial intelligence be included in the national curriculum, because more and more studies denote that AI plays a crucial role in educational institutions.

DISCUSSION

Regarding this article regarding AI in education and its environment, the study yielded significant results that are of great contribution to a deep understanding of Artificial Intelligence. In this research, the results of the application of information collection techniques that led to the achievement of the proposed objective were analyzed, the implications of the findings were highlighted, and connections were established with the survey and the existing literature.

It is important to mention that Artificial Intelligence is currently shown as the answer to the difficulties that members of the educational environment are going through, because it provides flexibility, agility and efficiency.

In relation to the purpose of the study, it was possible to analyze the implementation of artificial intelligence in the educational field, among these contributions it was possible to highlight virtual tutorials, individualized feedback, robotics, in addition to those highlighted by González such as personalizing activities, ways of adapting to changes and above all a capacity to provide feedback on Artificial Intelligence systems. with the possibility of being able to contribute to substantial improvements in education that imply accessibility and inclusion to more meaningful learning. (2023)

The research also revealed that there are ethical complications that prevent artificial intelligence from being carried out easily in all educational institutions, due to the risky possibility of openly exposing student data on the web and of dependency, leaving aside emotional skills and human interaction.

In our country, artificial intelligence is gaining more and more territory, even in some educational institutions subjects such as Robotics are offered so that students from secondary education have knowledge of AI, and can develop their creativity.

CONCLUSION

In view of the above, we can say that AI systems have been gaining ground year after year, due to their great contribution in different areas, including education. It is here, where it has made the greatest contribution in recent years, facilitating the process of monitoring activities, planning tasks, preparing questionnaires, publishing research papers due to the large amount of information available on the web. Artificial intelligence is not simply a reinforcer in tasks, it is also a way of learning in a didactic way, where the student can acquire knowledge individually.

However, although technology advances day by day, fear occurs when a machine is capable of acquiring skills from a human being, so teachers should stop this fear, because artificial intelligence when performing routine functions simply avoids wasting time and solves problems for the teacher. In this sense, the advantage that AI offers teachers lies in the fact that they can now focus on developing competencies and skills in students, leaving aside the search for information to make presentations with which to base their classes.

AI contributes to how we acquire knowledge and how we put it into practice, allowing adaptability, and feedback in an effective way achieving optimal learning in all students. Educational institutions should consider the use of artificial intelligence because multiple studies prove the great contribution it makes both to learning and to the way in which knowledge is brought to students. AI is a complementary instrument that facilitates various educational processes for teachers.

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