Application of artificial intelligence in the teaching-learning process: contributions to the Angolan educational system case: higher education institutions in Angola

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Summary

This article analyzes the contributions of Artificial Intelligence (AI) to the teaching-learning process, based on the perceptions of 76 Angolan higher education students. From the survey applied, it was identified that students have extensive knowledge and make frequent use of AI tools, especially for academic research and quick access to information. Although they recognize the benefits of AI for personalization and efficiency of teaching, students also warn of possible challenges, such as excessive dependence on technology. The majority reject the replacement of teachers by AI systems, but support the official integration of these tools in the educational environment. These results indicate that AI can contribute significantly to the modernization of education, as long as it is accompanied by policies that promote teacher training and the critical use of technologies.

Keywords: Artificial Intelligence, Teaching-Learning, Higher Education, Angola, Student Perceptions.

Abstract

This article analyzes the contributions of Artificial Intelligence (AI) to the teaching-learning process, based on the perceptions of 76 Angolan higher education students. The survey revealed that students have extensive knowledge and make frequent use of AI tools, especially for academic research and quick access to information. Although they recognize the benefits of AI for personalizing and teaching efficiency, students also warn of potential challenges, such as excessive dependence on technology.
The majority reject the idea of replacing teachers with AI systems, but support the official integration of these tools into the educational environment. These results indicate that AI can significantly contribute to the modernization of education, as long as it is accompanied by policies that promote teacher training and the critical use of technologies.

Keywords: Artificial Intelligence, Teaching-Learning, Higher Education, Angola, Student Perceptions.

1. Introduction

Artificial Intelligence (AI) has gained prominence in several areas of society, and education

is no exception. Tools like ChatGPT, Google Bard, automatic translators and spell checkers

Intelligent spelling is increasingly present in students' daily lives. Given this

global scenario, it becomes essential to analyze how these technologies can be applied in

specific educational contexts, such as the Angolan educational system.

This study aims to investigate the application of artificial intelligence in the teaching process.

learning in higher education institutions in Angola, seeking to understand the contributions

that these technologies can offer to improve the local education system. The

The justification for exploring this topic lies in the transformative potential of AI, which can

reshape the educational landscape through more accurate pedagogical diagnoses, interventions

personalized and more efficient educational management, based on automation and data analysis. When

focusing on Angolan higher education institutions, the study seeks to identify both opportunities and

the challenges for the integration of AI tools in the national context, aiming to promote a

more effective teaching-learning experience aligned with contemporary demands. This

In this way, it is expected to contribute to the construction of educational strategies that enhance the use of

artificial intelligence, strengthening the development of the educational system in Angola.

2. Theoretical framework

AI in education is an interdisciplinary field that combines computer science, pedagogy and

data analysis. According to Holmes et al. (2019), AI can be applied in tutoring systems

intelligent, adaptive learning platforms, automatic assessment systems and chatbots

educational. Ferreira (2022) states that the digital transformation in Angolan higher education involves

by using smart technologies to improve the efficiency of school management and monitoring

pedagogical. Cutatela et al. (2022), highlight that the success of AI in education depends on the preparation

of teachers and the existence of educational policies that encourage the ethical and efficient use of

technologies. Paulo (2022) adds that the school curriculum in Angola needs to be rethought to

include digital skills and the critical use of technology.

According to Ferreira (2022), the digital transformation in Angolan higher education requires a new model

of educational management based on data and AI. Cutatela et al. (2022), highlight that the adoption of

AI technologies can facilitate the personalization of teaching and the automation of tasks

administrative. In turn, Paulo (2022) highlights curricular dilemmas and the need for

teacher training to deal with technological tools.

Artificial Intelligence represents a transformation in the way we interact with technology and

with the world around us, in the article by Adriana Queli de Freitas 1, Lílian Andrade do Rêgo 2,

Madeanne Sousa Costa 3, Cassandra Paula Sales Linhares Monteiro 4, Waldenisia Dias da Pascoa Costa

5 (2025, p.3), "ARTIFICIAL INTELLIGENCE IN EDUCATION: CONTRIBUTIONS AND

CHALLENGES FOR THE TEACHING AND LEARNING PROCESSreference".

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In agreement with the author's thoughts, although intelligent machines can be effective in

provide immediate assistance and feedback, it is essential to recognize that they should not replace

completely the interactions between real people. by Adriana Queli de Freitas 1, Lílian Andrade do

Rêgo 2 Madeanne Sousa Costa 3, Cassandra Paula Sales Linhares Monteiro 4, Waldenisia Dias da Pascoa

Costa 5 (2025, p.10), "ARTIFICIAL INTELLIGENCE IN EDUCATION: CONTRIBUTIONS AND

CHALLENGES FOR THE TEACHING AND LEARNING PROCESSreference".

Authors such as Knox et al. (2019) emphasize that technology does not replace the role of a teacher

inspiring or human interaction in the construction of collaborative learning. Casagrande

(2019), warns that, although AI systems offer educational support, they should not replace

interaction between people, especially for developing children, where connections

interpersonal skills are fundamental.

On the potential of artificial intelligence to improve learning processes in the classroom,

we see how adaptive personalization, recommendation systems, virtual assistants

learning, predictive analytics and the integration of virtual and augmented reality technologies

can offer more effective and engaging approaches to meet the individual needs of

students and create more interactive and immersive learning experiences.

Still on this path According to Turbot (2017, p.2), cited by Gomes, 2023, p.43, "[...] machines

smart devices are playing an important role in delivering personalized knowledge and

relevant to students, where and when they need them."

As highlighted by Costa, et al., (2019, p. 60), "this approach leads students to a

learning based on freedom and horizontality, where the objects of study are more

intelligent, which favors greater engagement and interest on the part of students".

The Angolan education system faces historical challenges related to infrastructure, training

professional and educational coverage. However, the increasing penetration of the internet and devices

furniture presents new opportunities for the use of AI.

Studies such as Lopez (2022) show that the use of platforms such as Google Workspace for

Education can help develop digital skills in higher education institutions

Angolans. Faustino et al. (2022), observed during the COVID-19 pandemic a greater adherence to

Information and Communication Technologies (ICT), opening space for the integration of AI in teaching

distance.

2.1.   Benefits of AI in the teaching-learning process

Among the main benefits of AI in education, the following stand out:

the)   Personalizing teaching: adaptive platforms adjust content to the student's pace

student;

b)   Pedagogical diagnosis: AI can identify learning difficulties based on

performance standards;

w)   Assessment automation: reducing teaching workload with automatic corrections;

d)   Virtual assistants: support for students outside of class hours. These resources can make the

more inclusive, efficient and student-centered teaching-learning process.

2.2.   Challenges for implementing AI in Angola

Despite the potential, there are significant obstacles:

the)   Lack of technological infrastructure (stable internet, equipment);

b)   Low digital literacy among teachers and students;

w)   Human resource training: Teacher training is a critical point. Few

teachers have digital skills or have been trained to use emerging technologies in

teaching-learning process;

d)   Inequality in access: Regional and socioeconomic disparities mean that

only a small portion of students would have access to AI-based tools, expanding

even further the educational gap;

and)   High cost of commercial platforms and solutions. Cutatela et al. (2022), emphasize that

the implementation of AI in Angola requires a coordinated strategy between government, research institutions

education and private sector;

f)   Ethical and regulatory issues: The use of student data should be done with

responsibility, respecting privacy and security, which requires data protection policies

still incipient in Angola;

g)   Resistance to change: Many educators and school administrators may resist adoption

of new technologies due to lack of knowledge or fear of replacing their functions.

2.3. Opportunities for the application of AI in teaching and learning in Angola

Despite the challenges, the opportunities are vast and strategic:

the)   Personalized Education: AI can adapt teaching content and methodology to

individual needs of students, promoting more efficient and motivating learning;

b)   Expanding access to education: AI tools such as virtual tutors and learning platforms

online learning, can bring quality education to remote areas, overcoming barriers

geographical;

w)   Support for school management: Intelligent systems can assist in administrative organization,

assessment of student performance and optimization of resources;

d)   Continuous teacher training: AI can deliver training programs under

demand, adjusted to the specific needs of each educator;

and)   Stimulating pedagogical innovation: Methodologies such as project-based learning and

gamification can be enhanced with the use of intelligent systems, making the process

more dynamic and attractive educational;

f)   Preparing for the future of work: Including AI in the school curriculum can prepare

better prepare students for the demands of the global job market, which values digital skills and

technological.

2.4. Advantages of applying AI

The integration of AI into the Angolan education system would bring several advantages, such as:

the)   Improving educational efficiency by optimizing available time and resources;

b)   Reduction of educational inequalities, by enabling the democratization of access to

quality content;

w)   Development of digital skills from basic education, preparing students for

an increasingly technological world;

d)   Increased student motivation through more personalized teaching methods and

interactive.- Strengthening the analytical capacity of educational institutions, with the use of data

for making more assertive pedagogical decisions.

2.5. Disadvantages and risks of applying AI

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the)   On the other hand, the indiscriminate adoption of AI in education can generate side effects

worrying:

b)   Widening digital divide: Students without access to technology may be even more

marginalized;

w)   Over-reliance on algorithms: An overemphasis on automatic systems can

reduce the development of essential human skills such as empathy, creativity and

critical thinking;

d)   Security and Privacy Issues: The collection and storage of sensitive data from

students demand strict data protection policies, still under development in Angola;

and)   Replacing human contact: Teacher-student interaction is essential for the

emotional and social development of students, and cannot be fully replaced by

machines;

f)   Economic Challenges: Implementing and maintaining AI systems can become

financially unviable for many institutions.

2.6. Future proposals and perspectives

the)   For AI to be effectively integrated into the Angolan education system, it is necessary to:

b)   Investment in digital infrastructure in schools and universities;

w)   Continuous training programs for teachers;

d)   AI-supported local content development;

and)   Creation of specific public policies for the use of AI in education;

f)   Private Polytechnic Institute of Uíge (ISPPU), can lead initiatives in the region,

testing smart solutions and training teachers prepared for the new digital reality.

1.   Methodology

The present study was carried out by applying a structured survey to a sample of

76 higher education students in Angola, from different areas of knowledge and levels

academics. The questionnaire used covered questions related to the use of intelligence

artificial in the teaching-learning process, as well as the benefits, risks, expectations and

student positions regarding the integration of these technologies in education.

The responses collected were analyzed both quantitatively, to identify trends and

frequencies, and qualitatively, to deepen the understanding of perceptions and experiences

of students. This mixed approach enabled a comprehensive analysis of the impacts and perspectives of

AI in the Angolan educational context.

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Machine Translated by Google

ARCHIOS - Multidisciplinary Scientific Journal of Knowledge.
ISSN: 2675-9128. Sao Paulo-SP.

2.   Results and discussion

4.1. Usage and frequency

All 76 students surveyed said they had heard of or used some AI tool.
Furthermore, all reported that they use these tools frequently, which indicates a high level
familiarity and adherence to technologies based on artificial intelligence in the educational environment.

4.2. Purpose of use

The main purpose of using AI tools pointed out by students was to carry out
research. This result reflects the search for agility and practicality in accessing information, which
is aligned with global trends in the use of AI as a means of democratizing knowledge and
facilitate the students' investigative process.

4.3. Perceived benefits

When asked about the main benefit of AI in education, most highlighted access
fast access to information. This data reinforces the idea that AIs are being seen as allies in
overcoming traditional barriers of time and space to obtain knowledge, allowing
students to access content immediately and in a personalized way.

4.4. Risks and concerns

Despite the positive perceptions, students also demonstrated a critical view of the
possible risks. The main concern expressed was that the constant use of AI could lead to
increase in academic plagiarism with students becoming dependent on technology to solve
problems. This reflection points to the need for a balanced use of AIs, so as to
preserve students' intellectual autonomy and critical thinking.

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Conclusion

Analysis of the perceptions of higher education students in Angola revealed that intelligence artificial intelligence has significant potential to transform the teaching-learning process in country. Students demonstrate familiarity and frequent use of AI tools, recognizing their benefits for personalized teaching, agility in accessing information and pedagogical efficiency. However, they also express legitimate concerns about over-reliance on technology and the need to maintain the central role of the teacher in mediating knowledge. These results indicate that for AI to effectively contribute to the modernization of the educational system Angolan, it is essential that its integration be accompanied by educational policies that promote ongoing training for teachers and encourage the critical and ethical use of these technologies. Thus, artificial intelligence could become a strategic ally for strengthening education higher education in Angola, enhancing the quality and equity of the educational process.

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Attachments

Figure 1: Distribution of students by course in the survey applied.
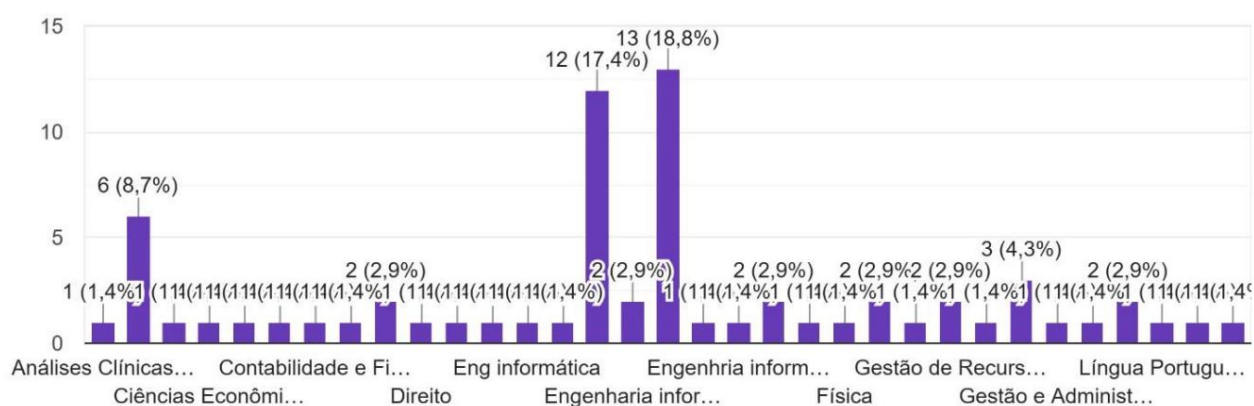
Qual é o seu curso?
69 respostas

Figure 2: Frequency of use of AI tools or generative platforms in academics

Com que frequência você utiliza ferramentas de IA ou plataformas generativas para fins académicos?
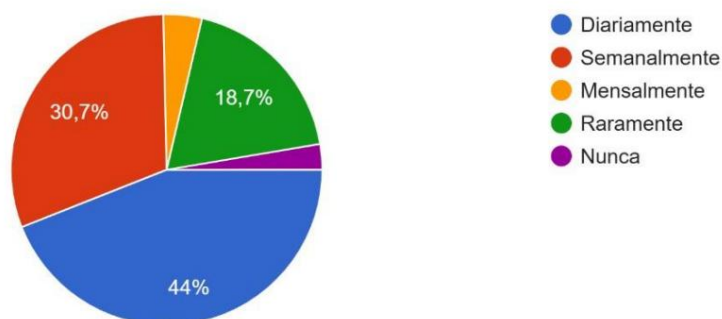75 respostas

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Figure 4: Academic activities using AI tools or generative platforms.

Para quais atividades académicas você utiliza ferramentas de IA ou plataformas generativas? (Pode escolher várias opções)
75 respostas

Atividade	Respostas
Pesquisa de informação	66 (88%)
Geração de ideias	27 (36%)
Redação de trabalhos	20 (26,7%)
Resolução de exercícios	22 (29,3%)
Tradução de textos	24 (32%)

Figure 3: Use of AI tools and generative platforms

Você acredita que o uso de ferramentas de IA e plataformas generativas pode levar a um aumento do plágio académico?
75 respostas

- Sim, muito — 49,3%
- Sim, em parte — 40%
- Não sei
- Não, em parte
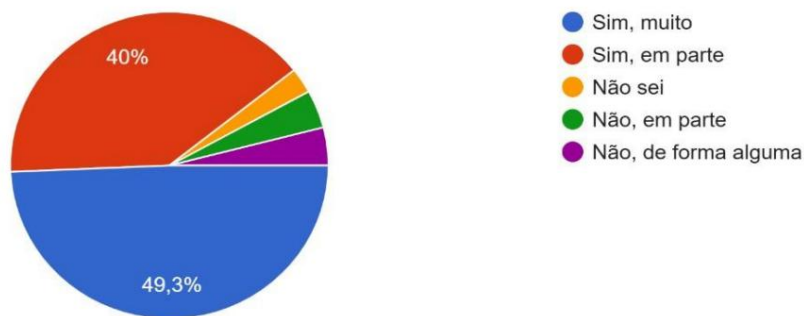- Não, de forma alguma

Figure 5: The utility and performance of AI tools and generative platforms

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Em que medida você considera que as ferramentas de IA e plataformas generativas são úteis para o seu desempenho académico?

74 respostas

54,1% Muito útil
32,4% Útil
Neutro
10,8% Pouco útil
Nada útil