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Integrating Artificial Intelligence Technology in Algerian Education: A Blessing in Disguise

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Abstract

Over the past few years, artificial intelligence has been changing the way humans see the world. Every facet of our society is being impacted, from the widespread use of mobile devices to increasingly complicated work environments. Even if we might not notice it in action, it also enhances our general well-being. The goal of the Algerian AI task force is to develop an AI strategy for Algeria to foster an understanding of how new technologies can be used to enhance people's quality of life. This will ensure that Algeria remains at the forefront of technological innovation. This paper seeks to explore to which extent Algerian universities and researchers deal with AI services and how they managed to invest in its benefits and avoid its drawbacks, so that, it would be possible to use AI wisely and responsibly in the future. To do so, qualitative research has been conducted with seven post-graduated researchers. The data were gathered through a semi-structured interview and the analysis revealed that Algerian universities are not really ready to adopt AI policies either because of the lack of material or curriculum updating and teachers ' training fortunately researchers tend to use AI in their research papers and struggle to avoid plagiarism.

Keywords: Artificial Intelligence, benefits, drawbacks , education, policy, plagiarism

ملخص

على مدى السنوات القليلة الماضية، غيّر الذكاء الاصطناعي الطريقة التي يرى بها البشر العالم. يتأثر كل جانب من جوانب مجتمعنا، بدءًا من الاستخدام الواسع النطاق للأجهزة المحمولة وحتى بيئات العمل المعقدة بشكل متزايد. وحتى لو لم نلاحظ ذلك أثناء العمل، فإنه يعزز أيضًا رفاهيتنا العامة. هدف فريق العمل الجزائري للذكاء الاصطناعي هو تطوير استراتيجية الذكاء الاصطناعي للجزائر بهدف تعزيز فهم كيفية استخدام التقنيات الجديدة لتحسين نوعية حياة الناس. وهذا سيضمن بقاء الجزائر في طليعة الابتكار التكنولوجي. هذا البحث يسعى لاكتشاف إلى أي مدى تتعامل الجامعات والباحثون الجزائريون مع خدمات الذكاء الاصطناعي وكيف تمكنت من الاستثمار في فوائدها وتجنب سلبياتها،لتحقيق استعمال حكيم ومسؤول للذكاء الاصطناعي في المستقبل ولهذا الغرض تم إجراء بحث نوعي مع سبعة باحثين في مرحلة ما بعد التدرج . تم جمع البيانات من خلال مقابلة شبه منظمة وكشف التحليل أن الجامعات الجزائرية ليست مستعدة حقًا لتكييف سياسات الذكاء الاصطناعي إما بسبب نقص الوسائل التكنولوجية أو عدم تحديث المناهج الدراسية وتدريب المعلمين، ولحسن الحظ يميل الباحثون إلى استخدام الذكاء الاصطناعي في أوراقهم البحثية ويكافحون لتجنب السرقة العلمية .

الكلمات المفتاحية : ذكاء اصطناعي، فوائد، عيوب، تعليم، سياسة، سرقة علمية

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Introduction

To advance the development and application of AI technology, numerous nations have published pertinent policies and reports. For example, the United States released a national AI research and development strategy plan and prepared for the future of AI in 2016. In addition, Stanford University published Artificial Intelligence and Life in 2030 as the inaugural output of the ongoing project "*One Hundred Year Study on Artificial Intelligence (AI100)*"; Pearson also co-published Intelligence Unleashed: An Argument for AI in Education with the University of California, Los Angeles Knowledge Lab. These policy texts have had a big impact on the world. Furthermore, in both the 2016 and 2017 Horizon Reports (basic education edition and higher education edition), Artificial Intelligence (AI) was identified as one of the fundamental technologies that would revolutionize teaching and learning over the next five years.

While information technology has brought about significant changes in society, education has only seen minor adjustments up to this point. While earlier technologies (such as radio, television, and movies) were heralded as educational miracles, almost all of them had a limited influence, partly because they merely mechanized or mimicked already-existing instructional techniques (such as broadcast lectures on radio and television) (McArthur et al., 1994). However, the convergence of artificial intelligence, cognitive science, and the Internet offers a chance that is distinct from previous technological advancements and goes beyond merely replicating current educational methodologies.

The production of instructional content has altered as a result of the Internet, a flexible medium that combines many communication devices (audio, video, and two-way communication), has altered the process of creating educational information, lowered its price, and increased its effectiveness. For instance, technology has made it feasible to use a number of innovative teaching strategies, such as inquiry learning and collaboration. Online chat and multiuser activities present options that were not previously available in the classroom. In youth, knowledge is fleeting; those who possess the ability to learn are sufficiently knowledgeable (Adams,1907).

The Algerian educational system is highly recommended to support the use of technology to enhance teaching and learning and to support innovation both at the level of universities and even schools. It is first obligatory to address the clear requirement for sharing knowledge and developing policies for “Artificial Intelligence,” a fast-advancing class of foundational abilities which are progressively embedded in all sorts of educational technology systems and are even available to the public. AI has the priority to address a set of challenging issues in education today and innovate learning and teaching practices in addition to its role in accelerating progress but, fast technological developments undoubtedly bring many troubles, risks and challenges that need updating policies based on debates and continuous studies and frameworks. In short, using AI in the teaching and learning process is a blessing in disguise. The present paper tries to explore the ability of Algerian universities in general and researchers in particular to use AI services without violating research ethics and principles and at the same time benefit from technological advances to achieve a global scientific position free from plagiarism and comply with research terms and standards. To do so, Two primary research questions were raised:

1. How could Algerian educational institutions investigate AI services avoiding its drawbacks?

2. How do Educational Institutions reach progressive research points with less plagiarism in the light of AI?

To answer these questions a set of secondary questions were built as a part of scientific research methodology.

Literature Review

AI refers to computer systems that can perform complex tasks that were previously only possible for humans, such as logical reasoning, decision-making, or problem-solving. Today, the term "artificial intelligence" describes a wide range of technologies that power many of the services and goods we use every day, from apps that recommend TV shows to chatbots that provide real-time customer support. But do all these technologies really represent artificial intelligence as most of us imagine? If not, then why do we use the term so frequently? In this article, you'll learn more about artificial intelligence, its practical uses, and the types of artificial intelligence. Finally, you'll also learn about some of its benefits and dangers, and discover flexible courses to further deepen your knowledge of artificial intelligence.

Artificial Intelligence Examples

Though they do not yet exist, you've undoubtedly seen humanoid robots frequently associated with AI interacting with machine learning-based services or gadgets, such as Data from Star Trek: The Next Generation or the T-800 from The Terminator.

In its most basic form, machine learning is the process of developing a machine learning model—a computer system that can be used to carry out tasks like music recommendation, route optimization, and text translation—by training algorithms on a set of data. Among the most prevalent applications of AI in use now are:

ChatGPT: Generates text based on queries or comments sent to it by using Large Language Models (LLMs).

Google Translate: This tool translates text between languages using deep learning algorithms.

Netflix: Based on a user's prior viewing behavior, the company uses machine learning algorithms to generate tailored recommendation engines.

Tesla: The self-driving elements of their vehicles are powered by computer vision.

A potential state in which computer systems will be able to equal or surpass human intelligence is known as artificial general intelligence or AGI.

In other words, Artificial General Intelligence (AGI) is "true" AI, the kind that is depicted in a ton of science fiction literature, comic books, TV shows, and motion pictures. On the notion of "AI," academics disagree on how to recognize "true" artificial general intelligence when it materializes. The Turing test, also known as the limitation game, is the most well-known method for determining if a machine is clever or not. Renowned mathematician, computer scientist, and cryptanalyst Alan Turing originally described the experiment in a 1950 paper on computer intelligence. Sir Turing then went on to explain a three–player game where a human ‘interrogator’ is required to send text messages to both a human and a machine, determining who wrote each response. Turing claims that the computer can be deemed intelligent if the interrogator is unable to identify the subject with any degree of reliability. To make matters more complicated, scientists and philosophers are divided on whether Artificial General Intelligence (AGI) is getting closer to reality or yet a long way off. For instance, a

recent study from Microsoft Research and Open AI contends that Chat GPT-4 is an early example of Artificial General Intelligence (AGI), although many other experts doubt these assertions and contend that they were produced purely for media attention (Turing, 1950). Progress in artificial intelligence is occurring not just within research facilities but is also captur ing headlines in mainstream media and education-focused publications (Cardona, 2023).

In 2023, the Stanford Institute for Human-Centered AI published the "AI Index Report "in which it has recorded a significant surge in investment within AI along with a rise in studies focused on ethics, particularly regarding fairness and transparency. Accor dingly, investigations into ethical matters are expanding as challenges become apparent. Ethical dilemmas and problems are likely to arise in educational contexts as well (Maslej et al., 2023).

The Categories of AI

Researchers need to start developing more sophisticated definitions of intelligence and perhaps consciousness as they work to create increasingly sophisticated artificial intelligence systems. Researchers have identified four AI categories to clarify ideas and views towards the uses of AI. Professor Arend Hintze of the University of Michigan summarized each form of AI as follows:

a. Automatic devices

The most fundamental form of AI is seen in reactive machines. These kinds of automatic machines only "react" to what is in front of them at any one time; they are unaware of past events.

Because of this, they are limited in their ability to accomplish certain sophisticated task, like playing chess, and are unable to carry out activities outside of their specific context

b. Memory-constrained computers

Machines with little memory have a limited comprehension of the past. Compared to reactive machines, they are more capable of interacting with their surroundings. Self-driving cars, for instance, employ a kind of limited memory to detect and react to incoming vehicles, change course, and change speed. However, because their recollection of past events is restricted and only employed in a narrow band of time, machines with limited memory are unable to acquire a thorough picture of the world.

c. The notion of mental machines

"Theory of mind" machines are an example of early artificial general intelligence. Such machines would be able to comprehend other entities that exist within the world in addition to being able to build representations of it.

d. Autonomous devices

The most advanced AI that exists theoretically is that of machines that are aware of themselves and the world around them. When most people discuss reaching AGI, they mean something like this. This is a far-off reality right now.

AI advantages and risks

AI has many uses and the ability to change both our daily lives and the way we operate. Many of these changes, such as wearable technology in the healthcare sector, virtual assistants, and self-driving automobiles, are exciting, but they also present a number of difficulties.

It is a complex image that frequently evokes conflicting visions—a dystopia for some, a utopia for others. Reality is likely far more nuanced. Here are some potential advantages and risks that artificial intelligence could bring:

Table 1. *Advantages and drawbacks of*

Possible advantages	Possible risks
Increased precision for some repetitive jobs, like putting computers or cars together.	Job losses as a result of growing automation.
Lower operating expenses as a result of the equipment increased efficiency.	Possibility of prejudice or inequity stemming from the dataset utilized for AI training.
Enhanced personalization of digital goods and services.	Potential cybersecurity issues.
Enhanced judgment and decision-making in specific circumstances.	Insufficient transparency regarding the decision-making process leads to suboptimal outcomes.
The capacity to produce new text or visual content quickly.	Possibility of spreading false information and unintentionally

Note 1. Adopted from Coursera Staff (2024, p.14)

AI is not restricted to one thing or a single ability but an octopus with many arms each arm stands for developed modeling capabilities. The following Figure shows AI's various types, Components, and subfields based on Regona et al (2022).

Figure 1. Components, types, and subfields of AI based on Regona et al (2022, p.12)

From the figure we observe that artificial intelligence involves many fields and subfields and includes a set of components and that's what makes it a deep interesting field of research and a treasure for humankind.

AI in Education

A "teacher for every student" or a "community of teachers for every student" is one goal of artificial intelligence and education. Making learning a communal activity and allowing students to submit in multiple forms (handwriting, voice, body language, and facial expressions) and facilitating a variety of instructional techniques (dialogue, inquiry, and cooperation).

Books, classrooms, and lectures have been the main teaching methods for hundreds of years. Information is carefully arranged into manageable packages by academics and educators, which passive students receive. They then labor alone, completing fixed homework from the outdated curriculum. These passive techniques imply that the goal of a student's work is to comprehend clear topics and demonstrate this comprehension in multiple-choice exams that are primarily factual and definition-based. According to this method, 95% of the questions are usually posed by teachers in the classroom and demand brief responses or problem-solving exercises (Graesser & Person, 1994; Hmelo-Silver, 2002).

According to Waterman et al. (1993), these teaching methods are not very successful; the only students who have shown success with them are the top-fourth of each class, who are frequently motivated and gifted.

It was discovered that there was a two standard deviation difference in student achievement between individual tutoring (1:1 teacher/student ratio) and classroom instruction (1:30 teacher/student ratio) (Bloom, 1984). That instance, when traditional lecture-based instruction was used, the typical achievement bell curve was centered on the 50th percentile and was lifted to the 98th percentile by one-on-one human teachers.

Information technology boosts productivity in business and the military and is useful in education. According to Regian et al. (1996), intelligent tutors efficiently cut learning time in half or one-third while producing gains equivalent to those of one-on-one tutoring. Remember that classroom performance can reach the 98th percentile with one-on-one personal mentoring (Bloom, 1984). Fletcher (1995) and Regian et al. (1996) claim that intelligent tutors are 30% more successful than traditional education. Networked versions of these programs also save running expenses by around 92% and require 70% less training of support staff.

There are many reasons to adopt AI services in educational systems and update educational policies that suit nowadays progressive development.

First, AI can facilitate achieving educational necessities and priorities in suitable ways, in a short time, and with less cost.

It is a policy priority to address the various incomplete learning that pupils have as a result of the pandemic, and AI may make learning resources more adaptive to the requirements and strengths of individual students. Enhancing teaching positions is a top priority, and AI may be able to help teachers more by way of automated assistants or other technologies. When teachers run out of time, AI may also allow them to provide more support to specific kids. Priority should be given to creating resources that take into account the knowledge and experiences that students bring to their education—their cultural and communal assets. Artificial intelligence may make it possible for curriculum materials to be more locally tailored. AI has the potential to improve educational services, as demonstrated by voice assistants, mapping tools, shopping recommendations, essay writing skills, and other commonplace applications.

Second, apprehension about possible future hazards and awareness of system-level concerns give rise to urgency and importance. For instance, students can see increased monitoring. While the Department vehemently denies the notion that AI may replace teachers, some educators are concerned that they might be supplanted. People are aware of instances of algorithmic prejudice discrimination, such as voice recognition software that struggles to recognize accents from different regions or test monitoring software that might unjustly flag some student groups for disciplinary action. AI may be used in invisible and infrastructure-

related ways, raising questions about trust and transparency. AI frequently appears in new applications with a magical quality, but educators and procurement regulations demand that edtech demonstrate its effectiveness. Artificial Intelligence may yield seemingly genuine knowledge that is, in fact, unreliable or unfounded in reality. Most importantly, AI poses new risks beyond the well-known ones related to data security and privacy. These risks include the possibility of scaling automation and pattern detectors that lead to "algorithmic discrimination" (i.e., systematic unfairness in the resources or learning opportunities recommended to certain student populations).

Third, the scope of potential unforeseen or unintentional repercussions makes things urgent. Teachers may find unintended repercussions when AI makes it possible for judgments to be automatically made at scale in the classroom. For instance, Achievement disparities may increase if AI adjusts by accelerating the curriculum for some students and slowing it down for other students (based on shaky ideas, insufficient data, or skewed assumptions about learning). The quality of the available data may occasionally lead to unexpected outcomes. One may presume, for instance, that an AI-powered teacher hiring system is more objective than one that scores resumes by hand. However, the AI system may deprioritize applicants who could add talent and diversity to a school's teaching staff if it is dependent on shoddy past data. In conclusion, it is critical to address AI in education immediately to take advantage of significant benefits, stop and reduce emerging threats, and deal with unforeseen repercussions.

Artificial intelligence in education brings enthusiasm and encourages advancements in learning institutions. It is crucial to oversee these innovations by thoroughly contemplating the context and implications. AI technologies present an exhilarating field for humanity; nevertheless, as the participants in this study have indicated, it is not a panacea for every issue nor a transformation that guarantees universal benefit. Consequently, the legal, ethical, pedagog ical, psychological, and sociological implications both positive and negative must be evaluated. As humanity is the primary stakeholder impacted by technology, the entire process must be conducted within a legal framework to prevent any harm (Göçen & Aydemir, 2020).

Methods and Materials

The present qualitative research has been conducted with seven Algerian researchers (doctorate students) who are preparing their thesis literature reviews in different literary fields, The data were collected using semi-structured interviews and were analysed to answer the aforementioned research questions.

Participants

The sample population of seven Algerian researchers from various specialities, that belong to human and social sciences (HSS), were selected according to the necessity to use AI in general and chat GPT in particular since they are about to write their literature reviews where the researcher needs to paraphrase, reformulate and organize all the possible theories, and remarks and show the previous gaps but with his own style and with no plagiarism. The following table demonstrates our participants and their fields of research.

Table 2. *Participant's personal information*

Participant's identity	Speciality	Field of research	Subscribing year	Degree of working progress
A	Human science	Educational psychology	4th Year	23%
B	Sociology	Family and society	6th year	45%

C	Arabic	Modern poetry structure	6th year	57%
D	English	ESP	5th year	35%
E	History	Western encounters	3rd year	22%
F	Islamic Sciences	Miracles in Holly Coran	2nd year	11%
G	Philosophy	Philosophy of mind	4th year	31%

Research Instruments

The study used a qualitative approach to address the population through a semi-structured interview. The research explores researchers' perceptions toward integrating AI services in writing research papers and the challenges they face while using it in addition to Algerian university's readiness to benefit from this innovative processing system. Semi-structured interview introduces more richness and details owing to their open-ended nature i.e., participants could be asked to explain, clarify rephrase their answers if it's necessary and even elaborate and extend ideas.

Research Procedures

The study took place in different university departments, the researcher chose the sample population according to their speciality, thus all of them are researchers in HSS. Researchers in this field usually base more on theoretical part and literature review and some of their research papers have no real practical part, they contain just an analysis or a comparison between theories, cases, styles or events. In such cases, researchers rely particularly on AI services and are more likely to fall into plagiarism.

Results

The data gathered from the semi-structured interview revealed a set of findings and came with different attitudes held by the participants. The interview was constructed of three parts. The first part contains simple questions about the researcher's identity field of study interests ……. The second part holds questions about the use of AI in Algerian universities either for teaching or learning purposes (since 4 participants are substitute teachers in their departments) and its drawbacks and benefits. In the last part we asked them to propose future recommendations, especially on how to avoid plagiarism in thesis writing or any research paper among these questions there was a sensitive question about if they used AI to write their literature reviews. The Analysis of the second and third parts came with:

Table 3. *Participants attitudes towards the use of AI in education*

Participants' attitude	Not satisfied	Quiet satisfied	satisfied	Very satisfied
Number	3	1	3	0

Table Three shows that those researchers are not very satisfied with the use of AI in education. According to participant 'G' who used to teach philosophy in his department:*' There is no concrete use of AI in our departments, students and teachers use AI for their own purposes, this year we have noticed a huge number of master students preparing their thesis using chat GPT nothing authentic no creativity just giving the topic to the AI application and it answers all*

their questions and prepares extended essays for them. What could I say plagiarism in its new form ". However, participant 'A' declares that '*it was very helpful for me I can prepare simple lesson plans for my students and they could themselves ask chat GPT their complex questions at home and not disturb our lesson and waste time but it would be a curse at the moment of exams and tests* ".

The next questions were concerning the use of AI in their research laboratories, surprisingly all of them said that there was no actual use of AI in their labs some of them argued that they did not even check their labs because there is no material no collaboration so they prefer to work at home with their own material, here the question that may rise up: is AI in higher education a myth or a reality? After all, participants were questioned if they used AI to write their literature reviews, and they answered as follows:

Table 4. *The relation between the use of AI and work progress*

	Number	Work progress	Years of work
No AI is used	2	22-23%	3-4 Y
AI is used	2	45-75%	4-6 Y
AI is highly used	3	11-31%	2-4 Y

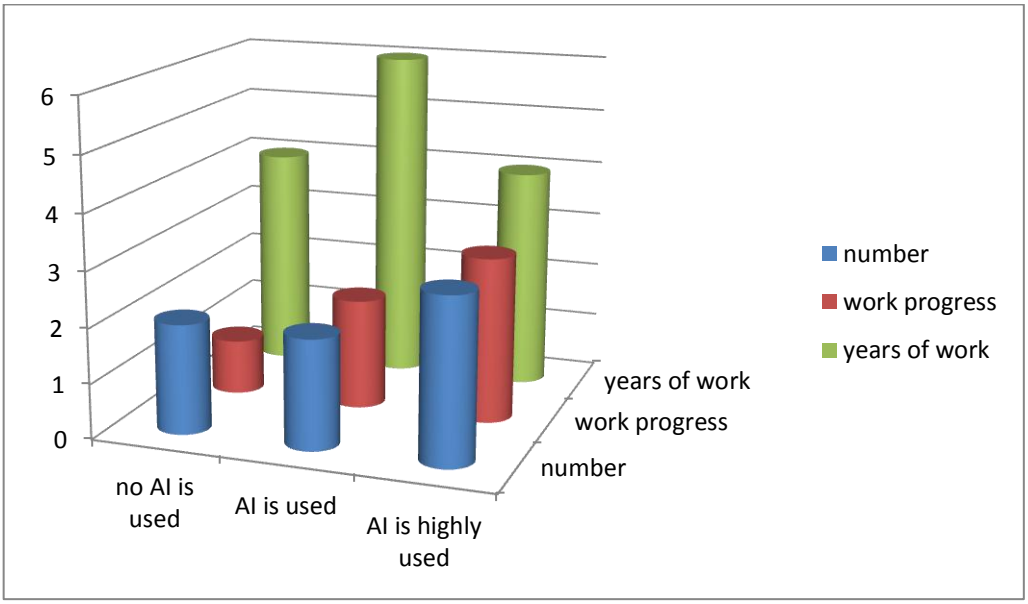

Figure 1. The relation between the use of AI and work progress

Both the table and the graph show clearly that AI helps researchers to achieve their work in less duration, thus those who use AI services achieved more than a quarter of the work in their first years. All the questioned researchers maintain that they try not to fall into plagiarism while dealing with chat GPT because they want to achieve a fully authentic work and avoid any problems when they submit their thesis in progress site to be verified. Technology is a sword with two edges, it is wisely recommended to be careful when we use AI services and how to use it ethically.

The interview contains a few questions about the benefits and disadvantages of using AI in addition to the challenges that may face both teachers and learners while using it

and even those which face universities in the first place and all Algerian educational institutions in the second place. The results were classified in the following table :

Table 5. *AI Advantages and drawbacks according to the participants*

Advantages	*Disadvantages*	*Challenges*
-Save time and efforts -facilitate the work and clarify ambiguous things -easy and rapid translation and text reformulation -it can replace the teacher at home It helps me learn new languages. It simplifies expressions and helps with writing literature reviews and solving problems	-it leads to laziness -it may kill creativity - students will lose their motivation to learn -it can cause work-losing -it leads to plagiarism - it replaces humans in almost everything - students who are not familiar with technology may suffer while using it -no barriers over and stop it	- The lack of technological material -Some AI applications are not for free -a special training for teachers is required - students have to know when why and how to use AI -The current policies have to be updated with AI requirements -all members of educational staff should invest to benefit from AI and not fall into its curse

A lot of work is required to achieve a full or at least partial integration of AI in Algerian universities as a part of educational life. Both students (future researchers) and teachers have to benefit from this innovative revolution update with any new and inclusive change and face any challenges. The world is progressively developed no time to stop or relax. It is up to authorities to adopt new curricula that match the new demands and control the use of AI in their educational institutions. By streamlining administrative work and allowing teachers to concentrate more on instruction and one-on-one interactions with students, artificial intelligence (AI) can enhance human-led teaching rather than take its place in the classroom.

AI applications in education need to be developed cooperatively and with fairness as their top priority. This will resolve inequalities that exist between different demographic groups and guarantee that all students can use them.

It is essential to teach students about artificial intelligence (AI), including how to develop AI technologies and recognize their potential risks, in addition to employing AI tools for educational objectives.

Discussion

The results of the present research have revealed that :

1. Algerian educational institutions can investigate AI services and avoid its drawbacks by providing more information and communication technologies (ICT) material, increasing the flow of the internet training teachers as well as researchers to use AI devices and techniques and updating their knowledge each time a new device or a technique appears from another side avoiding its drawback is a must, researchers usually fall in plagiarism and violate ethics of research, in addition, students in universities are basing more on the services of chat GPT either in preparing projects lessons or even to cheat in official exams. There is an increasing decline in creativity and problem-solving processes. That's why, Algerian Universities need to encourage self-based learning, realizing students' ideas in the form of small institutions and projects.
2. Algerian Universities can fight or at least minimize Plagiarism in research papers by offering more accounts in plagiarism-checking programs, helping students paraphrase ideas and quotes by increasing the number of methodology sessions,

guiding researchers and helping them by programming more seminars and fruitful workshops with effective feedback.

AI is a blessing innovation if it is used and controlled correctly and it has been mentioned in the literature review in the AI report in 2023, AI is an urgent need in education but researchers should not violate the research standards and ethics already mentioned humans have to benefits from AI in a legal context (Göçen & Aydemir, 2020).

Conclusion

The research aimed to discover the Algerian universities' and researchers' familiarity with AI and the way they can benefit from it without falling into its traps. The findings have shown that Researchers are struggling to use AI services to avoid plagiarism but they usually encounter a high citation rate, or worse, a percentage of similarity or conformity that violates the conditions of journals or universities since they had no serious training on how to use the services of AI or even due to their complete reliance on AI without any self-reliance. Moreover, Algerian universities are still far from professionally controlling AI, facilitating its use by students and researchers and providing it more widely by providing advanced technological means (ICTs) as a first step.

Educational activities have changed as a result of the quick changes occurring in artificial intelligence, cognitive science, education, and the web. Information technology undoubtedly makes individuals closer to one another. Every individual on the planet is about to become a teacher and a student to everyone else. This technology has the power to alter the way that education is fundamentally conducted. To guarantee that the upcoming changes benefit students rather than organizations, managing this intersection point necessitates the complete participation of all parties. The convergence of artificial intelligence and education is not only possible but imminent in today's quickly changing technological landscape. It is important to understand what artificial intelligence is and is not when utilizing new technologies. After all, enormous power entails great responsibility.

Recommendations

AI is not being introduced into education to replace teachers. Researchers who are employed by Artificial Intelligence in Education (AIED) have to concentrate on areas where AI can accomplish complicated activities that are otherwise challenging or relieve teachers of ordinary responsibilities. It is common information that every student is different from the next in terms of their socioeconomic background, preferences, likes, and dislikes, as well as their own learning style. These distinct characteristics may be found using AI, which can then be utilized to create and maintain a student model for every learner.

AI is a blessing in disguise and an octopus with many arms. Algerian educational institutions especially universities have to prepare and update themselves to keep up with the potential changes and be able to deal with the new challenges and as it is known new enemies require new swords.

In Algeria, things will highly change especially with the introduction of 'The National School of Artificial Intelligence' which is an institution of excellence for education whose vocation is to educate engineers specializing in AI and data sciences.

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Declaration of AI Refined

This document has benefited from the application of AI-driven tools, including Grammarly and Scholar AI Chat, to refine its linguistic aspects. These tools were utilized to correct grammar and spelling and improve the overall writing style. It is acknowledged that the use of these technologies may introduce certain AI-generated linguistic patterns. However, the core intellectual content, data interpretation, and conclusions presented remain the sole work of the authors.

Statement of Absence of Conflict of Interest

The authors declare that there are no conflicts of interest related to the research, findings, or recommendations presented in this paper. All conclusions drawn are independent and unbiased.

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