

## Challenges and Prospects of Using Artificial Intelligence in the Educational Process: Perspectives of University Teachers – A Field Study

Fatima Zohra Meriah<sup>1\*</sup>, Ghiat Hayat<sup>2</sup>

<sup>1\*</sup> Doctor, Faculty of Social Sciences, Laboratory of Applications in Psychology and Educational Sciences for Development in Algeria, University of Oran2, (Algeria).

Email: [meriah.fatimazohra@univ-oran2.dz](mailto:meriah.fatimazohra@univ-oran2.dz)

<sup>2</sup> Professor, Faculty of Social Sciences, Laboratory of Applications in Psychology and Educational Sciences for Development in Algeria, University of Oran2, (Algeria).

Email: [ghiat.hayat@univ-oran2.dz](mailto:ghiat.hayat@univ-oran2.dz)

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**Abstract:** This paper revolves around the importance of the Artificial Intelligence AI in education and the scientific research from the perspective of the teachers. In this regard, we administered an electronic questionnaire to know about the interest of the teachers in AI, in learning it, and in recommending it to the students. Besides, we shed light on the use of AI by the teachers in the scientific research, and used a survey on a sample of 50 university teachers from the different Algerian universities. Findings show that the majority of the teachers recommend the use of AI to the students. In addition, most consider that AI is a manifestation of the education quality. Finally, most of them neither master AI nor rely on it in their works despite their awareness about its importance.

**Keywords:** Artificial Intelligence, Education, Scientific research, University teachers, Questionnaire survey.

### Introduction

AI is a branch of computer science that aims at establishing systems that can execute the tasks that need the human intelligence. It dates back to the mid-20<sup>th</sup> century and has witnessed, later, development in various fields such as the symbolic thinking, machine learning, and language processing. It ranges from the weak intelligence that executes a specific task to the strong that mimics the human intelligence and the super intelligence that exceeds the human. Its importance lies within its ability to increase the efficiency, productivity, exactness, and innovation in education, health, business, industry, transportation, etc. Its applications cover the personal assistants, the chat bots, the auto-drive cars, marketing systems, etc.

### A - The theoretical side

#### 1 - Problematic of the study:

Technology and sciences are witnessing unprecedented transformation now. In this regard, the techniques of AI play a vital role in changing the society and affecting the various fields, including the scientific research. The latter witnesses important transformations in using the techniques to facilitate research and analysis. This raises questions about the effect of these transformations on the scientific research. AI is a step towards a bright future, as it improves many life aspects. The AI can be invested for the good functioning of the researches and the interaction of the human mind and creativity in the academic filed. However, despite awareness about the importance of this development, the researchers do not show initiatives to learn or use AI in the scientific research and education, as proven by the study of Berrabeh Mohamed & Ali Hamidouche, which found out that AI in the scientific research is still in its

beginning and does not get its merits. Besides, the research centers in the Arab world did not make enough studies and researches. Based on what was said, we raise the following questions:

- Do the teachers encourage their students to take training on AI?
- Are the teachers themselves qualified in using AI?
- Do the teachers use AI in their researches and scientific life?

## **2 -Hypotheses :**

- The teachers encourage their students to take training on AI.
- The teachers are qualified in using AI.
- The teachers use AI in their researches and scientific life.

## **3 - Aims of the study :**

- Providing a background on AI.
- Knowing the strategies of AI in developing the higher education.
- Reaching recommendations that contribute to the adoption of AI in higher education.

## **4- Artificial Intelligence (AI):**

It is one of the concepts that has been highly used recently in the light of globalization, as its applications are unlimited. In the beginning, it was mere imaginary ideas watched in imaginary films. However, it turned into a reality that is commonly used (Kemmiche, 2023, p. 354). Its main features include the analysis, the end of the routine tasks, and the reduction of the tasks to the minimum. Besides, it has many independent applications that suit the developing technology and allow providing customer service via chat-bots (Yacine, 2021). As for education, it aims at improving the quality, efficiency, availability, and diversity of teachers and students. Its applications include the virtual assistants, the improved evaluation, the skills learning, the language learning, the integrated learning, the project-based learning, and the collaborative learning. In addition, it helps provide remarks to the students, the automation of the administrative tasks, determining the fields where the students need extra help, improving the interaction between the teacher and the students, increasing the access to education, and improving the grades.

Its challenges in education cover ethical, legal, technical, cultural and human issues, such as privacy protection, security, property rights, bias, quality, equivalence, and interaction. As for its horizons in education, it provides chances to enrich the learning experiences, creativity, innovation, and integration. For instance, it allows developing new methodologies, styles, and tools for learning. However, it requires a social responsibility to guarantee its legal and efficient use. In this regard, it is necessary to design, develop, and use the smart techniques in a way that preserves the transparency, equality, accountability, and ethics. The goals and target benefits of AI in education must be clearly underlined to protect the human rights and respect the privacy. Moreover, the suitable training must be provided to the students and teachers to understand the AI techniques.

## **5 - AI (concepts) :**

- It is a set of developed computer systems that can execute tasks that require human intelligence, such as the visual recognition, speech recognition, problem solving, decision-taking, etc (Allak & Drid, 2022, p. 709).

- It is the machine's ability to make the cognitive tasks that need human mind, such as reasoning, recognition, learning, interaction, problem solving, and creativity (Goujil & Kerziz, 2021, p. 250).

## **6 - Characteristics of AI:**

It is characterized with:

- Solving problems.
- Thinking about the problems based on inputs.
- Using the experience and error to discover the different things.
- Rapidly responding to the new situations and conditions.
- Dealing with the complicated and vague cases, even in the absence or lack of information (Saidi & Fellag, 2021, p. 273).

## **7 - Advantages of AI in the educational process:**

It can manage the school to reduce the administrative burdens through turning the administrative system into electronic to facilitate taking the correct decision, setting timetables, and discovering the talented students and providing special programs for them.

- It helps get rid of the one method learning. For instance, the different educational platforms suit the different inclinations and needs of the students.
- It provides the opportunity to learn and develop the self, thanks to the learning and logic machines, auto-correction, and self-programing.
- It allows establishing organized databases to store information efficiently and enable the staff, mainly the administrative, to get knowledge and learn the experimental rules that are found in books and other sources. Besides, the school can protect the special knowledge from loss due to the retirement or resignation of the employees.
- It helps find solutions to complex problems in a brief time. In addition, it helps the people with specific needs, mainly through translating texts from written format to sound format, and vice versa. This helps the non-seeing or non-hearing people. Moreover, it increases the experience of the teachers, mainly in the light of the absence of expert teachers.
- It provides many aspects of the main content and teaching skills, and gives better data and recommendations for the teachers.
- The computes are ideal to target the basic content for the student, determine the gaps in skills, and provide the teachers with evaluation data in due time. Furthermore, Ai equips the novice teachers with technical assistance to perform well and discover the non-academic learning difficulties.
- It simplifies the innovations, complements distinct aspects of education, and reinforces the teachers' performance. In addition, it provides a deep vision to the practitioners and decision makers to provide access to quality education to all the students.
- It provides the necessary support to the students.

The schools need experience about establishing and managing AI applications, and must provide the suitable infrastructure for this technology. This requires:

- Establishing the smart content from the digital proofs to textbooks to digital learning facades that can be personalized at all the educational levels.
- Providing smart learning systems that use AI.

- Providing applications that allow scanning the handouts, and adding the required suppositions to be converted into interactive pages, and encouraging the active participation of the learner.
- Acquiring, updating, and preserving the knowledge to be used in solving educational problems.
- Facilitating linking knowledge, the scientific experiments, and the practical aspects.

## 8 - Literature review:

The integration of AI into the education is a new topic. Therefore, we found only analytical studies, namely:

**1. The study of Leila Mekatel & Hania Hesni:** they analyzed AI and its educational application to develop the educational process. They found out that despite the advantages of AI in education, it has drawbacks, mainly in the conservative societies that focus on their heritage and draw their power from their cultural specificity. This needs thoughtful use of AI with the human intelligence to achieve the advantages of AI and avoid its drawbacks. In addition, the study recommended:

- designing AI-based educational programs,
- providing environments that contribute to the socio-pedagogic study,
- improving the level of the stakeholders,
- training them on the use of technology and smart systems to cope with the development,
- establishing a department for AI in the universities to train AI specialists,
- conducting empirical studies that show the efficiency of the AI-based education,
- spreading the technological culture and awareness about the positive effects of AI and the virtual societies,
- informing the parents on how to have access to the educational websites when the suitable technology is available (Leila, Hania, 2021, 109).

**2. The study of Souad Boubaja:** the author analyzed the applications of AI and found out that:

- The rapid development brought about by technology caused the 4<sup>th</sup> industrial revolution, where AI is a prominent output.
- AI is a giant leap in the theoretical and practical fields, as it mimics the human intelligence.
- AI penetrated all the fields and provided many chances for many sectors, as it enables making huge profits.
- Some states developed and accelerated the application of AI thanks to its advantages on the economic systems that allow a thorough restructuration of the economic structures.

In addition, the author recommended:

- Raising awareness of people on the concept of AI to facilitate its spread and use.
- Making efforts to incarnate the digital citizen who can easily deal with AI.
- Adopting educational programs that go with AI.
- Supporting the local scientific potentials specialized in AI.
- Facilitating the establishment of research centers specialized in AI.

- Enacting laws that go with the rapid developments in AI.
- Adopting incentives to attract the national and foreign capabilities working on AI (Souad, 2022, p. 85).

**3. The study of Berrabeh Mohamed & Ali Hamidouche:** they analyzed the electronic education and AI and their achievements and challenges in the Western and Arab states. They found out that:

- There are gaps between the education in the West and in the Arab world, as seen in the rank of the universities, the unfit of the education outputs to the labor market in the Arab world, the high unemployment rates, the brain drain, and the despair lived by the researcher in the Arab world.
- As for the scientific research, it is still in its start, as the research centers in the Arab world conducted only few works that are not valorized. This applies to the AI researches, as it did not get its merits (Berrabeh, 2022, p. 45).

**4. The study of Chebli (1991):** it tackled the experience of using AI in planning the open education programs at the University of Alexandria. It aimed at using the computer as a medium for the open self-study. Findings showed consensus on the importance of the program as a pioneering experience in the field. The study provided 14 educational programs to the students. Thus, the experience can be relied on in the general and higher educations.

**5. The study of al Kahlout & al Mokayad (2017)** aimed at identifying the requirements of using the smart learning in the educational process in the Palestinian universities that use AI. The requirements include the structures, tools, devices, programs, techniques, methods, and the organizational and human resources. The study used the descriptive method and administered a questionnaire to 100 experts at the Faculty of Education and Computer Systems. Findings showed that the requirement of the method elements ranked first with 96.71%, the requirement of the organizational and human resources ranked second with 88.33%, the requirement of the need to modern techniques and programs ranked third with 85.03%, and the requirement of the structures and tools ranked last with 84.80% (Bekkari, 2022, p. 86).

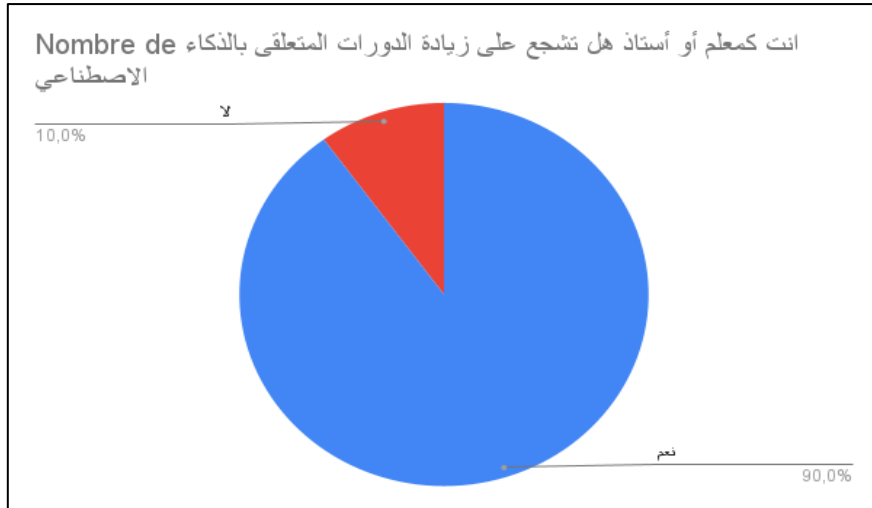
### **B - The practical side:**

We administered an electronic questionnaire to a sample of 50 teachers from the Faculty of Sociology, as the authors found difficulties convincing other teachers to answer the questionnaire since the topic is new. We used the questionnaire because the used method is a survey that aims at learning about the views of the teachers about the importance of AI in the scientific research.

### **Presentation and analysis of the results:**

#### **1. Presentation of the results of the 1<sup>st</sup> hypothesis:**

The teachers encourage their students to take training on AI.



**Figure 01:** results of the 1<sup>st</sup> hypothesis

The figure shows that 90% of the teachers said yes while 10% said no when we asked if they encouraged their students to take training on AI. This shows that the teachers are aware about the importance of AI in the scientific research.

## 2. Presentation of the results of the 2<sup>nd</sup> hypothesis:

The teachers are qualified in using AI.



**Figure 02 :** results of the 2<sup>st</sup> hypothesis

The answers show that the big majority do not master AI applications, as 72% said they do not master them while only 28% said they do. The latter is a considerable rate that shows the interest of the teachers in AI and their awareness about its importance in the scientific research and self-development.

## 3. Presentation of the results of the 3<sup>rd</sup> hypothesis:

The teachers use AI in their researches and scientific life.

To test this hypothesis, we used 03 sub-questions, as follows:

1. Do you rely on the solutions and innovations of AI to solve the scientific problems you face?



**Figure 03:** results of the 3<sup>st</sup> hypothesis

The answers to this question are shown in the figure. In this regard, 64% of the teachers do not rely on AI to solve their scientific problems while 36% do. The latter is a considerable rate with the start of this new technology, which will have an important position in the future thanks to the services it provides.

2. Does the university teacher rely on the techniques of AI in planning his lessons?



**Figure 04:** results of the 3<sup>st</sup> hypothesis

Figure 04 shows that 68% do not rely on AI in making their lesson plans while 32% do. Despite the awareness of the teachers about the importance of AI in the scientific research, it is not common amid them.



**Figure 05:** results of the 3<sup>st</sup> hypothesis

The figure shows that a big share (56%) of the informants relies on AI in translating their works and documents.

#### **Discussion of the results:**

Findings show the awareness of the university teachers about the importance of AI, as a big share of them advises the students to get training on it. However, they do not master it. They use it in translating their works, not in preparing their lesson plans. The rapid developments brought about by science and technology led to the 4<sup>th</sup> industrial revolution, where AI is a prominent output. It is a giant leap in the practical and theoretical fields, as it mimics the human intelligence and penetrates many sectors. In addition, it helps make huge profits in many fields, mainly the scientific research. In this context, some states accelerated and developed the applications of AI thanks to its effects on the scientific cognitive systems and to the ability to make restructuring towards producing knowledge and high value techniques.

Although some believe that AI has many drawbacks and threatens the position of the human minds in the big systems, we must design educational programs based on AI without neglecting the human brain. Besides, we must employ AI applications in the educational institutions and in education for development and for saving time and effort, not for laziness or human unemployment. Therefore, it is necessary to improve the level of the education of the stakeholders and train them on the use of technology and the smart systems to cope with the developments of AI. Furthermore, we should establish university departments specialized in AI, as confirmed by the study of al Kahlout and al Mokayad (2017) that aimed at determining the requirements of employing the smart learning in education in the Palestinian universities that use AI. In addition, the study of Chebli was an experiment of the strategies of AI in planning and programming the educational curricula of the open education at the University of Alexandria. It aimed at using the computers as medium for self-education in the

open education. It provided 14 educational proposals for the open education students and concluded that the experiment can be taken advantage of in the higher and open educations. As for our study, it proved the awareness of the teachers about the importance of AI.

We obtained very important survey results. The results of this study proved to us that the use of artificial intelligence techniques in scientific research has great potential to improve the competencies of university students through preparing their work, translating research and documents, and analyzing scientific texts. To achieve this, students must have the capabilities and means. Necessary equipment such as computers, appropriate internet speed, necessary basic skills, financial and administrative support for using artificial intelligence applications. The results also showed differences in the percentage of students using artificial intelligence between states, and the reasons for these differences are due to the lack of means and capabilities, and the lack of the Internet in most southern cities compared to northern cities. Enabling students to fully benefit from artificial intelligence technologies is achieved by providing the necessary capabilities and means to contribute to enhancing the quality of scientific research among all university students across the country. By integrating artificial intelligence techniques into scientific research, significant improvements can be achieved in the efficiency and performance of university students by relying on the innovations and solutions provided by artificial intelligence to solve the problems presented to students in scientific research, reduce errors, increase the efficiency of data analysis, accelerate the discovery process, and provide advanced and complex analytical tools that may be difficult or impossible using traditional methods.

Adopting these technologies enhances the ability of university students to develop innovative solutions using artificial intelligence, which contributes to advancing progress and innovation in scientific research.

Studies of the use of artificial intelligence technologies have also proven that they have great benefits for improving university students' competencies in scientific research. The benefits of using artificial intelligence in scientific research depend largely on the extent to which students know how to use these technologies in preparing their coursework and research work.

The use of artificial intelligence in scientific research faces several challenges that require addressing to fully benefit from this advanced technology of collecting and cleaning data, which is obtaining accurate and complete data. Data may be incomplete or noisy, requiring significant cleaning and processing efforts to ensure its quality. Cost and infrastructure Because implementing AI projects requires powerful and often expensive computing infrastructure, which may be a drawback for many research institutions. Skills shortage is due to a shortage of qualified individuals who possess the skills and experience necessary to develop and implement artificial intelligence projects, which requires significant investments in training and education to enhance these skills among researchers.

The results also demonstrated that the use of artificial intelligence technology in scientific research provides an interactive environment that encourages deep learning and innovation in the fields of scientific research, as these technologies can personalize learning and provide advanced analysis tools to stimulate innovation in scientific research. Artificial intelligence is also an important tool that many students rely on to translate their research and academic assignments. However, it is necessary to use these tools responsibly while developing personal skills to ensure the quality and accuracy of work in scientific research. Through appropriate education and training, an effective balance can be achieved between the use of

technology and the development of personal skills, which enhances the competence and performance of students in scientific research.

So, artificial intelligence technologies are considered a high-quality tool that can play a pivotal role in improving the quality of teaching and learning despite the challenges associated with the cost of implementation and disparities in access to technology. Artificial intelligence technologies can also contribute to achieving a comprehensive and effective educational experience that helps students prepare for a future full of learning. With challenges and opportunities

### **Recommendations:**

- The impression about AI must be rationalized through setting it in the scientific and social frame of the university, and based on the developmental needs of the state.
- It is necessary to design educational programs based on AI and to employ it in the education and the administrative tasks at the university.
- It is necessary to provide educational environments that contribute to the psychopedagogic studies.
- It is necessary to improve the level of the stakeholders and train them on the use of technology and smart systems to cope with the developments.
- It is necessary to establish university departments for training AI experts.
- It is necessary to make empirical studies that show the efficiency of the educational programs based on AI.
- It is necessary to spread the technological culture and raise the awareness about the positive effects of AI and the use of the virtual meetings.
- It is necessary to raise the awareness of the parents about the access to the digital educational websites when the suitable technology is available.
- The university should enhance academic training in artificial intelligence techniques.
- Providing the necessary technical infrastructure.
- Encouraging applied research in the field of artificial intelligence.
- Raising awareness of the benefits of artificial intelligence.
- Propose educational and training programs to enhance students' abilities to use artificial intelligence.
- Strengthening cooperation between universities and technical companies.
- Supporting innovation and creativity using artificial intelligence.

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