# Attitudes and Perceptions Towards the Use of Artificial Intelligence in Higher Education: A Survey Study on a Sample of Academic Staff in Algeria

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**Abstract**

This study explored the attitudes and perceptions of Algerian Academic Staff toward using artificial intelligence in higher education. The study investigated the challenges and prospects of this advanced technology and measured the readiness of Algerian universities to adopt it. The study's significance lies in uncovering the potential of utilizing this technology in universities, revealing the obstacles that may hinder it, and then providing a vision for how to adopt it through the use of an integrated and multi-faceted approach to advance higher education in Algeria. To verify this, the researchers used a questionnaire that targeted a sample of professors at the University of Blida 2-Lounici Ali. The findings showed that the study participants were interested in implementing AI technologies in higher education and their potential to enhance the educational process, facilitate organization, and enable ongoing performance evaluation. However, professors expressed concerns about AI's potential impact on students' critical thinking, the overwhelming amount of information that could impede creativity, ethical and legal issues, and the risks to personal data security. Professors emphasized the need for Algerian universities to invest in the exploitation of AI technologies, in human capital development by providing training courses in AI technologies for successful implementation, ensuring the availability of adequate financial resources, and taking into consideration the establishment of regulatory and ethical laws to control the exploitation of this technology.

*Keywords:* Academic Staff, attitudes, Algeria, Artificial Intelligence, Higher Education, perceptions

ملخص

هدفت هذه الدراسة إلى استكشاف مواقف وتصورات أساتذة الجامعات الجزائرية نحو استخدام تقنيات الذكاء الاصطناعي في التعليم العالي، من خلال البحث في تحديات هذه التكنولوجيا المتطورة، وقياس مدى استعداد الجامعة الجزائرية لتبنيها، وتكمن أهمية الدراسة في الكشف عن إمكانيات الاستفادة من هذه التكنولوجيا في الجامعات، وكشف المعوقات التي قد تعوقها، ومن ثم تقديم رؤية لكيفية تبنيها من خلال استخدام نهج متكامل ومتعدد الجوانب للنهوض بالتعليم العالي في الجزائر. وللتحقق من ذلك، استخدم الباحثين منهجية تتضمن استبيانًا يستهدف عينة من الأستاذة بجامعة البليدة 2-لونيسي علي. أظهرت النتائج أن المشاركين في الدراسة كانوا مهتمين بتطبيق تقنيات الذكاء الاصطناعي في التعليم العالي لإمكاناتها في تعزيز العملية التعليمية وتسهيل التنظيم وتمكين تقييم الأداء المستمر. ومع ذلك، أعرب الأساتذة عن مخاوفهم بشأن التأثير المحتمل للذكاء الاصطناعي على التفكير النقدي للطلاب، والكم الهائل من المعلومات التي يمكن أن تعيق الإبداع، والقضايا الأخلاقية والقانونية، ومخاطر أمن البيانات الشخصية. وأكد الأساتذة على ضرورة استثمار الجامعات الجزائرية في استغلال تقنيات الذكاء الاصطناعي، في تنمية رأس المال البشري من خلال توفير دورات تدريبية في تقنيات الذكاء الاصطناعي للتنفيذ الناجح، وضمان توفر الموارد المالية الكافية، ومراعاة وضع قوانين تنظيمية وأخلاقية للسيطرة على استغلال هذه التكنولوجيا.

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## Introduction

The development of Artificial Intelligence (AI) technologies has provided solutions to problems that traditional methods could not solve. Since emerging, AI has rapidly influenced various fields, including education, sparking debates about its benefits and drawbacks. Although many questions are developing around AI, one fact remains certain: this innovative technology is gradually reshaping our lives.

Higher education is undergoing profound and rapid change in these modern technological advances. The revolutionary changes have the potential to fundamentally alter the way the university environment functions and challenge the educational systems that have long dominated it. While the pace of change may seem overwhelming and uncertain, it is important to recognize that these changes allow us to reshape and rebuild the structures that sustain our educational system.

The Algerian university is not isolated from these developments; nevertheless, it is lagging behind them for many reasons that may be related to awareness of the importance of using artificial intelligence, fear of its impact, weak technological capabilities, or qualified personnel. This prompted us to conduct a study to explore professors' attitudes toward using artificial intelligence applications in higher education in Algeria.

Therefore, the objectives of the study are to identify:
- Pros of using artificial intelligence techniques in higher education.
- Readiness of Algerian universities to use artificial intelligence techniques in the educational process.
- Requirements for employing artificial intelligence technologies in higher education.
- Disadvantages of using artificial intelligence techniques in higher education.
- Challenges facing the use of artificial intelligence technology in higher education.
- Professors' proposals about using artificial intelligence techniques to develop the educational process.

Based on the above, the study was designed to answer the following questions:
1. What are the pros of using artificial intelligence techniques in higher education?
2. How ready is the Algerian university to use artificial intelligence techniques in the educational process?
3. What are the requirements for using artificial intelligence technologies in higher education?
4. What are the disadvantages of using artificial intelligence techniques in higher education?
5. What are the challenges facing the use of artificial intelligence technology in higher education?
6. What are Professors' proposals about using artificial intelligence techniques to develop the educational process?

## Literature Review

### *The Emergence and Concept of Artificial Intelligence*

The concept of organic measurement has played a significant role in the base of various theories interpreting human and social phenomena. At the same time, the human body has become a source of inspiration for the development of technology that can simulate the functions of different organs and vital systems, including the brain - the unique characteristic of humans. Initially, this process involved creating simple devices that could mimic some basic

brain functions, like calculators. However, this simulation technology has evolved, leading to the development of complex machines that can perform a wide range of functions at incredible speed. Computers, for instance, have unlocked the imaginations of researchers and scientists, allowing them to develop algorithms that enable machines to exhibit intelligence that mimics human intelligence.

The principle of AI is to provide machines with human-like intelligence, enabling them to think, function, and perform like humans. Therefore, AI can be defined as "the science and engineering of making intelligent machines, especially intelligent computer programs" (McCarthy, 2007, p. 2). The OECD (Organization for Economic Cooperation and Development) defines AI as: "the discipline of creating algorithms that can learn and reason" (Berryhill et al., 2019, p. 11). AI also refers to the use of intelligent machines to solve problems, make decisions, and perform tasks traditionally done by humans. It encompasses a range of technologies (Blank, 2021).

Hence, we can state that AI is the technology that allows computers and machines to emulate human intelligence and problem-solving abilities (What is AI?). These technologies are developed through complex algorithms that equip machines with abilities to learn from data inputs, recognize patterns, and make decisions according to that information. AI can be applied to a wide range of domains, for instance: business, education, communication, defense, and healthcare, to name a few. Its ability to enhance efficiency and reduce errors has raised the interest in AI as a means of improvement in different fields.

The term "artificial intelligence" was first used in 1956, during a workshop at Dartmouth College (Mijwil & Abttan, 2021). "The 1956 Dartmouth summer research project on artificial intelligence was initiated by August 31, 1955 proposal, authored by John McCarthy, Marvin Minsky, Nathaniel Rochester, and Claude Shannon" (McCarthy et al., 2006, p. 12). It is considered the beginning of the artificial intelligence discipline (Hasan, 2022). Since then AI has revolutionized over time.

### Artificial Intelligence in Education

After the Dartmouth summer research project in 1956, Artificial Intelligence research witnessed a salient development in different domains, particularly education.  The use of artificial intelligence in higher education is no longer just an aspiration, but rather a reality whose rapid development we witness daily. Caution or fear of using this advanced technology can no longer limit its ability to expand and have an influence.  The discussion about the benefits and harms of artificial intelligence in education will proceed along with the development of its use. The concern arises over many issues, including: "the concerns about depersonalization and the ethical considerations" (University of San Diego, n.d, p. 20), On the other hand, many benefits of artificial intelligence present themselves, such as enhancing students' learning experiences and effectiveness, and boosting their motivation, which can lead to lower dropout rates and higher completion of studies; and offering personalized and flexible learning pathways tailored to specific goals established by either the teacher or the student to facilitate the learning process (Pedró, 2020).

Among the tasks currently involved in the use of artificial intelligence in higher education are: Plagiarism Detection, Exam Integrity, Chatbots for Enrollment and Retention, Learning Management Systems, Transcription of Faculty Lectures, Enhanced Online Discussion Boards, Analyzing Student Success Metrics, Academic Research, and Connected Campuses (University of San Diego, n.d).

Many artificial intelligence tools have been developed which can be used in higher education, including:

*The Gradescope*: AI tool that enables students to assess one another and offer feedback (Doncheva & Asenov, 2023). This tool greatly simplifies the grading process for educators (Bransen, 2024).

*Canva*: AI Canva tools are used to create and enhance designs including presentations and graphics (Canva Team, 2024).

*PowerPoint Speaker Coach*: is an AI tool designed to help educators improve their presentation skills. It provides real-time feedback on aspects such as pacing, filler word usage, tone, and clarity, making it an essential resource for teachers looking to enhance their lecture delivery and student engagement (Bransen, 2024).

*Julius AI*: is an intelligent data analysis tool that simplifies the process of interpreting, analyzing, and visualizing complex data (Heinrichs, 2024).

*Dragon Speech Recognition for Education*: provides speech recognition software that can be utilized by both students and faculty (Doncheva & Asenov, 2023). Dragon helps students with accessibility needs particularly (Nuance, n.d).

*Altitude Learning*: is a learning platform designed to empower teachers and students with personalized and customized curriculums, access to learning assessment tools, and easy monitoring of student progress (Altitude Learning, n.d). Altitude Learning "powers the growing learner-centered movement with pedagogical support and a software platform. Together, we can enable all learners to drive their learning and reach their full potential" (Altitude Learning, n.d, p. 1).

The list of AI tools for higher education is extensive and cannot be fully detailed here. According to the "AI in education" working group at Tilburg University in the Netherlands, the leading AI tools for 2024 include ChatGPT for various inquiries, Bing Chat for comprehensive and creative responses, Perplexity for quick ideas and insights, Quillbot for enhancing writing skills, Canva for creating attractive presentations, and Grammarly for improving written work (Bransen, 2024).

Artificial intelligence has contributed to the development of new educational approaches, such as Education 4.0. This learner-centric approach emphasizes the needs of both students and teachers while adapting to technological advancements. It represents a forward-thinking blueprint for transforming education systems and methodologies (Borkar, 2024).

The latest report on 'Shaping the Future of Learning: The Role of AI in Education 4.0' demonstrates four key promises that AI can support in Education 4.0: 1-Supporting teachers' roles through augmentation and automation, 2-Refining assessment and analytics in education, 3-Supporting AI and digital literacy, and 4-Personalizing learning content and experience (World Economic Forum, April 2024).

Artificial intelligence has opened up a wide variety of opportunities for development in higher education, still, many education systems worldwide are slow to keep up with this progress, including Algeria.

Even scientific studies on the subject in Algeria are scarce. We only found one scientific study in 2024 that addressed the use of "Artificial Intelligence in Higher Education and Scientific Research in Algeria" (Djenane, 2024, pp. 114-124). However, the study was not based on field research but rather was limited to a theoretical reading of what was published on the subject. In this paper, we have tried to fill this gap by conducting a field study through

which data is collected and analyzed to answer the questions raised.

## Methods and Materials

A descriptive survey method was used to achieve this study's objectives. The research utilized both qualitative and quantitative methodologies to analyze data collected from a specific group of professors at the University of Bilda2-Lounici Ali, using a structured questionnaire based on a five-point Likert scale.

### Participants

The study's purposive sample consisted of 105 university teachers, intentionally selected for their expertise in artificial intelligence and related technologies.

The purposive sampling size was determined to be 10% of the total university teachers in each of the blida2-Lounici Ali University's four faculties: Humanities and Social Sciences Faculty (30), Literature and Languages Faculty (20), Law and Political Sciences Faculty (26), and Economic and Commercial Sciences and Management Sciences Faculty (29) in the academic year 2023/2024. The variables determined in the selection were: gender, academic rank, professional experience, and academic specialization.

The demographic characteristics of the study sample are shown in Table One as follows:

Table1. *Demographic parameters of the study sample*

| Sex | Frequency | Percentage |
|---|---|---|
| Feminine | 71 | 67,6% |
| Male | 34 | 32,4% |
| Job rank | Frequency | Percentage |
| Professor of higher education | 21 | 20% |
| Professor Lecturer A | 44 | 41,9% |
| Professor Lecturer b | 17 | 16,2% |
| Assistant Professor A | 7 | 6,7% |
| Assistant Professor B | 16 | 15,2% |
| Professional Experience | Frequency | Percentage |
| Less than five years | 9 | 8,6% |
| From 5 to 10 years | 39 | 37,1% |
| More than 10 years | 57 | 54,3% |
| Faculty | Frequency | Percentage |
| Faculty of Art and Languages | 20 | 19% |
| Faculty of Law and Political Science | 26 | 24,8% |
| Faculty of Economic, Commercial, and Management  Sciences | 29 | 27,6% |
| Faculty of Humanities and Social Sciences | 30 | 28,6% |
| Total | 105 | 100% |

Through Table One and considering the frequencies of the study sample members, which amount to a total of 105 respondents, the demographic data of the respondents can be extracted as follows:

We note that 71 respondents represent the number of females at a rate of (67.6% n=71), while the number of male respondents reached 34 respondents at a rate estimated at 32.4% (n=34).

Regarding academic rank, Lecturer A constitutes the largest group (41.9%, n=44), followed by Professors of Higher Education (20%, n=21). Lecturer B (16.2%), Assistant Professor B (15.2%), and Assistant Professor A (6.7%) represent the remaining categories.

The largest percentage of respondents (54.3%, n=57) possess over 10 years of professional experience. The 5-10 year experience group accounts for 37.1% (n=39), while those with less than 5 years of experience constitute 8.6% of the sample.

Finally, the Faculty of Humanities and Social Sciences encompasses 28.6% of participants (n=30), closely followed by the Faculty of Economic, Commercial, and Management Sciences (27.6%, n=29). The Faculty of Law and Political Sciences and the Faculty of Arts and Languages represent 24.8% and 19% of the sample, respectively.

## Research Instruments

The research instrument used to collect the quantitative data from the study field (a sample of 105 professors) was an oriented (structured) questionnaire constructed according to the five-point Likert scale.  The questionnaire in its final form included the following: Personal data or demographic parameters of the study sample, including gender, academic rank, professional experience, and academic specialization. The first axis consists of statements to measure professors' attitudes toward the pros of using AI techniques in higher education. The second axis consists of statements to measure professors' attitudes toward the readiness of Algerian universities to use AI techniques in the educational process. The third axis consists of statements to measure professors' attitudes toward the requirements for using artificial intelligence technologies in higher education. The fourth axis consists of statements to measure professors' attitudes toward the disadvantages of using artificial intelligence techniques in higher education. The fifth axis consists of statements measuring professors' attitudes toward the challenges facing the use of AI technology in higher education. The sixth axis consists of statements to measure professors' proposals about using artificial intelligence techniques to develop the educational process.

## Conducting Validity and Reliability Tests

To test the questionnaire form's ability to measure the variables we were investigating, it was presented to a group of arbitrators, and some amendments were made based on their comments.

The reliability of the questionnaire was confirmed using Cronbach's alpha index of 0.895. This questionnaire includes seven topics, and each topic contains several Likert-type questions. The arithmetic average and the Standard Deviation of the collected data were calculated with the help of the Statistical Package of Social Sciences (SPSS).

## Research Procedures

This study employed quantitative and qualitative methodologies to investigate the attitudes of university teachers regarding the use of artificial intelligence in higher education in Algeria. The decision to use a mixed approach was made to gain a more comprehensive understanding of the research topic. An exploratory study was first conducted in the four faculties of Blida2-Lounici Ali University using interviews to set the topic and its questions and determine the appropriate sample. In the second phase, the questionnaire was distributed to 10 percent of the teachers in each faculty of all ranks (assistant professor, lecturer, professor of higher education). The collected data were processed via SPSS, arithmetic means and standard deviations were extracted, and the validity of the hypotheses was tested. Based on the extracted data, the qualitative analysis was built and the results were drawn.

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## Results

This section delves into the analysis of data collected from the study participants, following the systematic review of literature on AI in higher education.

| Trends \\ Variables | SA | | A | | N | | D | | SD | | mean | standard deviation | Ranking | Trends |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | frequency | % | frequency | % | frequency | % | frequency | % | frequency | % | | | | |
| Enabling faculty members to design a stimulating learning environment | 33 | 31.4 | 56 | 53.3 | 10 | 9.5 | 6 | 5.7 | - | -- | 4,10 | 0,79 | 3 | High |
| Facilitating the process of following up, monitoring and guiding students | 18 | 17.1 | 64 | 61 | 14 | 13.3 | 7 | 6.7 | 2 | 1.9 | 3,85 | 0,85 | 8 | High |
| Providing knowledge bases for managing educational content | 30 | 28.6 | 55 | 52.4 | 12 | 11.4 | 7 | 6.7 | 1 | 0.9 | 4,01 | 0,87 | 5 | High |
| Providing professors with feedback to improve the teaching process | 28 | 26.7 | 47 | 44.8 | 19 | 18.1 | 10 | 9.5 | 1 | 0.9 | 3,87 | 0,95 | 6 | High |
| Helping students do their homework through many smart applications | 19 | 18.1 | 49 | 46.7 | 17 | 16.2 | 18 | 17.1 | 2 | 1.9 | 3,62 | 1,03 | 10 | High |
| Helping to develop critical thinking among students | 18 | 17.1 | 28 | 26.7 | 30 | 28.6 | 21 | 20 | 8 | 7.6 | 3,26 | 1,18 | 12 | Medium |
| Facilitating the process of grading all types of multiple choice tests | 22 | 21 | 40 | 38.1 | 29 | 27.6 | 9 | 8.6 | 5 | 4.8 | 3,62 | 1,06 | 11 | High |
| Providing a continuous evaluation system for the performance of the faculty member and student | 21 | 20 | 52 | 49.5 | 23 | 21.9 | 8 | 7.6 | 1 | 0.9 | 3,80 | 0,88 | 9 | High |
| Holding scientific meetings with faculty members, such as conferences | 27 | 25.7 | 60 | 57.1 | 13 | 12.4 | 5 | 4.8 | - | -- | 4,04 | 0,75 | 4 | High |
| Providing multiple channels for holding various meetings for university members | 21 | 20 | 56 | 53.3 | 20 | 19 | 8 | 7.6 | - | -- | 3,86 | 0,82 | 7 | High |
| Facilitating the conduct of scientific research | 39 | 37.1 | 49 | 46.7 | 11 | 10.5 | 4 | 3.8 | 2 | 1.9 | 4,13 | 0,88 | 2 | High |
| Archiving university information and data for easy access | 43 | 41 | 52 | 49.5 | 6 | 5.7 | 3 | 2.9 | 1 | 0.9 | 4,27 | 0,77 | 1 | very high |
| **General standard** | | | | | | | | | | | 3,86 | 0,64 | | High |

*Figure 1.* Professors' attitudes toward the pros of using AI techniques in higher education

Figure One indicates the sample members' answers to the axis of the positives of using artificial intelligence techniques in higher education most of the sample individuals' answers have a high degree of agreement on the indicators of this axis the arithmetic mean score for this axis reached 3.868, indicating a strong consensus on the benefits of AI integration in academia.

Regarding the positives of using AI techniques in higher education, a large majority of participants (61%) responded, that it facilitates the process of following up, monitoring, and guiding students. Also, 57.1% of participants confirmed that AI enables the holding of scientific meetings with faculty members, such as conferences. Participants (53.3%) agreed that AI Provides multiple channels for holding various meetings for university members. Additionally, providing knowledge bases for managing educational content of professors

affirms that AI can provide knowledge bases for managing educational content. With an equal rate estimated (49.5%)of participants confirmed that AI Provides a continuous evaluation system for the performance of the faculty member and student, and Archiving university information and data for easy access.

From the above, the respondents' answers show the ability of artificial intelligence to transform higher education by increasing efficiency, enhancing communication, and enhancing personal learning experiences. Artificial Intelligence can revolutionize higher education through enhanced learning experiences, personalized instruction, and optimized administrative procedures (Onesi-Ozigagun et al., 2024, p. 597).

| Trends / Variables | Trends SA frequency | SA % | A frequency | A % | N frequency | N % | D frequency | D % | SD frequency | SD % | mean | standard deviation | Ranking | Trends |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Provides a technological structure that keeps pace with technical development | 20 | 19 | 20 | 19 | 19 | 18.1 | 33 | 31.4 | 1 | 0.9 | 3,01 | 1,33 | 6 | Medium |
| Provides qualified human capabilities | 14 | 13.3 | 26 | 24.8 | 27 | 25.7 | 31 | 29.5 | 7 | 6.7 | 3,09 | 1,16 | 3 | Medium |
| Provide sufficient knowledge of how to use artificial intelligence techniques | 18 | 17.1 | 23 | 21.9 | 23 | 21.9 | 28 | 26.7 | 13 | 12.4 | 3,05 | 1,29 | 4 | Medium |
| Provides training and qualification for the human element | 14 | 13.3 | 27 | 25.7 | 32 | 30.5 | 22 | 21 | 10 | 9.5 | 3,12 | 1,17 | 2 | Medium |
| Provides a will to adopt these smart technologies | 14 | 13.3 | 36 | 34.3 | 30 | 28.6 | 18 | 17.1 | 7 | 6.7 | 3,30 | 1,11 | 1 | Medium |
| Availability of appropriate financial capabilities | 17 | 16.2 | 26 | 24.8 | 19 | 18.1 | 28 | 26.7 | 15 | 14.3 | 3,02 | 1,32 | 5 | Medium |
| General standard | | | | | | | | | | | 3,09 | 1,09 | | Medium |

*Figure 2.* Professors' attitudes towards the readiness of Algerian universities to use AI techniques in the educational process

Figure Two indicates that the responses of the sample members to the axis of the readiness of Algerian universities to employ artificial intelligence techniques in the educational process that most of the responses of the sample individuals with a moderate degree of agreement on the indicators of this axis, as the arithmetic mean for the axis of the readiness of Algerian universities to employ artificial intelligence techniques in the educational process was Educational score is 3.098. towards the level of an average degree.

Professors have positive attitudes as regards the readiness of Algerian universities to provide a will to adopt these smart technologies (34.3%). We can say that the professors' positive attitude suggests a recognition of the potential benefits and a willingness to engage in this significant transformation. This indicates a certain level of buy-in and receptiveness towards technological advancement. While their attitudes were negative regarding providing a technological structure that keeps pace with technical development(31.4%), providing qualified human capabilities(29.5%), sufficient knowledge of how to use artificial intelligence techniques(26.7%), Also into the availability of appropriate financial capabilities(26.7%). These concerns point to a disconnect between the desire for change and the practical resources and capacity necessary to achieve it.

This results analysis reveals a scenario where the desire for technological change coexists with clearly recognizing the challenges and resource constraints. To bridge the gap and successfully implement smart technologies, Algerian universities need to focus on addressing the structural limitations, invest in human capital development, and ensure the availability of adequate financial resources. This multifaceted approach is crucial for realizing the full potential of smart technologies within the Algerian higher education system.

| Trends / Variables | SA frequency | SA % | A frequency | A % | N frequency | N % | D frequency | D % | SD frequency | SD % | mean | standard deviation | Ranking | Trends |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| The necessity to train teachers and students on how to use artificial intelligence techniques | 70 | 66.7 | 31 | 29.5 | 4 | 3.8 | - | -- | - | -- | 4,63 | 0,559 | 2 | very high |
| The need to provide an additional financial budget for higher education institutions | 64 | 61 | 36 | 34.3 | 3 | 2.9 | 1 | 0.9 | 1 | 0.9 | 4,53 | 0,694 | 4 | very high |
| The necessity to provide halls equipped with the necessary technological equipment | 73 | 69.5 | 30 | 28.6 | 2 | 1.9 | - | -- | - | -- | 4,68 | 0,509 | 1 | very high |
| The necessity of developing legislation and regulatory laws to codify the process | 61 | 58.1 | 38 | 36.2 | 6 | 5.7 | - | -- | - | -- | 4,52 | 0,606 | 5 | very high |
| The necessity of establishing a culture in the university community to adopt artificial intelligence technologies | 66 | 62.9 | 32 | 30.5 | 6 | 5.7 | 1 | 0.9 | - | -- | 4,55 | 0,650 | 3 | very high |
| General standard | | | | | | | | | | | 4,583 | 0,457 | | very high |

*Figure 3.* Professors' attitudes towards the requirements for using artificial intelligence technologies in higher education

Figure Three shows that the sample members' answers to the axis of requirements for employing artificial intelligence techniques in higher education had a very high degree of agreement on the indicators of this axis, as the arithmetic mean for the axis of requirements for employing artificial intelligence technologies in higher education reached 4.583. Towards a very high degree level.

According to the survey, the majority of professors (69.5%) agreed on the need for providing halls equipped with necessary technological equipment. Additionally, (66.7%) of the professors supported the necessity of training teachers and students on how to use artificial intelligence techniques, while (62.9%) agreed on the need for establishing a culture of adopting artificial intelligence techniques in the university community.

The data indicates a strong consensus among respondents that AI is important for higher education. AI-powered adaptive learning systems can harness vast troves of data on students' learning styles, preferences, and abilities, enabling the creation of tailored learning passageways that meet their unique needs and help them succeed (Mohammed, 2023, p. 31). The high agreement on trends related to technological infrastructure, teacher training, and cultural change emphasizes the need for a multifaceted approach to integrating AI into universities.

| Trends \ Variables | SA | | A | | N | | D | | SD | | mean | standard deviation | Ranking | Trends |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | frequency | % | frequency | % | frequency | % | frequency | % | frequency | % | | | | |
| Excessive amounts of information discourage creative work | 22 | 21 | 39 | 37.1 | 28 | 26.7 | 15 | 14.3 | 1 | 0.9 | 3,63 | 1,002 | 5 | High |
| Developing mental laziness and reducing critical thinking | 29 | 27.6 | 42 | 40 | 11 | 10.5 | 20 | 19 | 3 | 2.9 | 3,70 | 1,151 | 4 | High |
| Bias and misinformation in algorithms | 19 | 18.1 | 33 | 31.4 | 38 | 36.2 | 12 | 11.4 | 3 | 2.9 | 3,50 | 1,011 | 6 | High |
| It poses a risk to the security of personal data | 38 | 36.2 | 35 | 33.3 | 24 | 22.9 | 6 | 5.7 | 2 | 1.9 | 3,96 | 0,999 | 2 | High |
| Isolation, lack of human interaction, and social learning | 34 | 32.4 | 33 | 31.4 | 26 | 24.8 | 11 | 10.5 | 1 | 0.9 | 3,84 | 1,030 | 3 | High |
| Ethical, legal, content ownership, and transparency issues | 41 | 39 | 37 | 35.2 | 23 | 21.9 | 4 | 3.8 | - | -- | 4,10 | 0,872 | 1 | High |
| General standard | | | | | | | | | | | 3,789 | 0,740 | | High |

*Figure 4.* Professors' attitudes toward the disadvantages of using artificial intelligence techniques in higher education

Figure Four reveals that the sample members' answers to the axis of the negatives of using artificial intelligence techniques in higher education are that most of the sample individuals' answers have a high degree of agreement with the indicators of this axis, as the arithmetic mean for the axis of the negatives of using artificial intelligence technologies in higher education was 3.789, means the degree level is high.

Many respondents expressed negative attitudes towards using AI technologies in higher education. Their concerns focused on several variables, the most notable being the development of mental laziness and a reduction in critical thinking (40%). Other concerns included issues related to ownership of content and transparency (39%), excessive amounts of information inhibiting creative work, ethical and legal issues (37.1%), bias and misinformation in algorithms (36.2%), as well as the perceived threat to the security of personal data (36.2%).

This underscores the need for careful planning, consideration of ethical issues, and a careful approach to integrating AI into higher education. Future research should develop strategies to address these concerns and ensure that AI is used effectively to improve learning in higher education.

| Trends \ Variables | Trends | | | | | | | | | | mean | standard deviation | Ranking | Trends |
| | SA | | A | | N | | D | | SD | | | | | |
| | frequency | % | frequency | % | frequency | % | frequency | % | frequency | % | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lack of standardized, reusable digital educational resources for personalized, adaptive learning | 46 | 43.8 | 48 | 45.7 | 10 | 9.5 | 1 | 0.9 | - | -- | 4,32 | 0,686 | 1 | very high |
| The need for more research on the types of data that should be used in AI models | 37 | 35.2 | 58 | 55.2 | 8 | 7.6 | 2 | 1.9 | - | -- | 4,24 | 0,673 | 3 | very high |
| Lack of compatibility between the development of artificial intelligence technologies and the reality of their use in teaching | 49 | 46.7 | 43 | 41 | 11 | 10.5 | 2 | 1.9 | - | -- | 4,32 | 0,740 | 2 | very high |
| Lack of multidisciplinary AI techniques for learning | 39 | 37.1 | 40 | 38.1 | 22 | 21 | 2 | 1.9 | 2 | 1.9 | 4,07 | 0,912 | 6 | High |
| Increasing inequality in education by widening the digital divide between students | 39 | 37.1 | 43 | 41 | 20 | 19 | 3 | 2.9 | - | -- | 4,12 | 0,817 | 5 | High |
| Inadequate knowledge of artificial intelligence techniques among teachers | 40 | 38.1 | 52 | 49.5 | 11 | 10.5 | 2 | 1.9 | - | -- | 4,24 | 0,714 | 4 | very high |
| Negative attitudes toward artificial intelligence among students and teachers | 25 | 23.8 | 54 | 51.4 | 19 | 18.1 | 7 | 6.7 | - | -- | 3,92 | 0,829 | 10 | High |
| Lack of research on the social and emotional aspects of using AI in education | 31 | 29.5 | 47 | 44.8 | 21 | 20 | 6 | 5.7 | - | -- | 3,98 | 0,855 | 9 | High |
| Lack of educational perspective in artificial intelligence research | 38 | 36.2 | 42 | 40 | 18 | 17.1 | 6 | 5.7 | 1 | 0.9 | 4,05 | 0,924 | 8 | High |
| Evaluation methods for artificial intelligence in education are lacking | 38 | 36.2 | 39 | 37.1 | 24 | 22.9 | 4 | 3.8 | - | -- | 4,06 | 0,864 | 7 | High |
| General standard | | | | | | | | | | | 4,132 | 0,547 | | High |

*Figure 5.* Professors' attitudes toward the challenges facing the use of AI technology in higher education

Figure Five demonstrates that the answers of the sample members to the axis of challenges facing the use of artificial intelligence technology in higher education showed that most of the answers of the sample members obtained a high degree of agreement on the indicators of this axis, as the arithmetic mean for the axis of challenges facing the use of artificial intelligence technology was Artificial intelligence in higher education is 4.132, that is, towards the level of a high degree.

A significant percentage of respondents believe that the most important challenges facing the use of artificial intelligence in higher education are the need for more research on the types of data that should be used in artificial intelligence models (55.2%) and the lack of unified and reusable digital educational resources for personalized and adaptive learning (45.7%), negative attitudes towards artificial intelligence among students and teachers (51.4%), and increasing inequality in education through widening the digital gap between students (49.5%).In addition to the lack of unified, reusable digital educational resources for personalized, adaptive learning (45.7%).

Based on these trends, it is clear that professors recognize the potential of AI in education. However, they also have significant concerns about its implementation. There is a strong emphasis on the need for robust resources, comprehensive research, and effective training for professors and students to ensure systematic, thoughtful, and successful integration of AI.

| Variables | Trends | | | | | | | | | | mean | standard deviation | Ranking | Trends |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | SA | | A | | N | | D | | SD | | | | | |
| | frequency | % | frequency | % | frequency | % | frequency | % | frequency | % | | | | |
| Knowledge of data to manage the flow of large quantities | 39 | 37.1 | 47 | 44.8 | 18 | 17.1 | 1 | 0.9 | - | - | 4,18 | 0,744 | 6 | High |
| Technological literacy to know how AI devices work | 42 | 40 | 55 | 52.4 | 6 | 5.7 | 2 | 1.9 | - | - | 4,30 | 0,667 | 5 | very high |
| Striving towards serious adoption to establish a culture of using artificial intelligence in the university community | 49 | 46.7 | 48 | 45.7 | 7 | 6.7 | 1 | 0.9 | - | - | 4,38 | 0,656 | 4 | very high |
| Conducting training courses for the benefit of the human element in universities | 59 | 56.2 | 39 | 37.1 | 7 | 6.7 | - | -- | - | - | 4,50 | 0,622 | 2 | very high |
| Providing a budget for developing the use of artificial intelligence | 61 | 58.1 | 38 | 36.2 | 6 | 5.7 | - | -- | - | - | 4,52 | 0,606 | 1 | very high |
| Establishing special regulatory laws and legislation | 55 | 52.4 | 42 | 40 | 7 | 6.7 | 1 | 0.9 | - | - | 4,44 | 0,664 | 3 | very high |
| General standard | | | | | | | | | | | 4,38 | 0,459 | | very high |

*Figure 6.* Professors' proposals about using artificial intelligence techniques to develop the educational process

Figure Six clarifies that the responses of the sample members to the axis of professors' proposals on the use of artificial intelligence techniques in developing the educational process showed that most of the responses of the sample individuals had a very high degree of agreement on the indicators of this axis, as the arithmetic means for the axis of professors' proposals on the use of artificial intelligence techniques reached In developing the educational process, the score is 4.387.

Professors' proposals regarding the use of artificial intelligence techniques in developing the educational process were mainly represented in providing a budget for developing the use of artificial intelligence (58.1%), conducting training courses for the benefit of the human element in universities (56.2%), establishing laws and regulatory legislation related to artificial intelligence (52.4%), Striving towards serious adoption to consolidate the culture of using artificial intelligence in the university community (46.7%).

The data shows that professors recognize the significance of artificial intelligence in higher education. They prioritize allocating the necessary resources to facilitate the responsible use of AI within legal, ethical, and scientific frameworks to advance education in universities. In this regard, Yang Lin points out that AI offers many benefits to higher education, such as personalized learning support and efficient task management for both students and teachers. However, concerns about academic integrity, biases in AI, and the reliability of information necessitate thorough study and policy development in educational settings to address the challenges it presents ( Lin, 2024, p. 142).

## Discussion

The findings of this research revealed that the majority of professors are convinced of the advantages of using artificial intelligence in higher education, this is in the various dimensions and elements of the educational process that serve both the professor and the student, the educational content, and the evaluation system. According to the teachers surveyed, the main opportunities for implementing AI in higher education are the possibility of using AI systems to facilitate student monitoring and guidance, organizing scientific meetings, offering various channels for university meetings, and providing knowledge bases for managing educational content. In addition, AI can support continuous evaluation of faculty and student performance, as well as archiving university information and data for easy access.

This was confirmed by Borisov and Stoyanova (2024) that the use of AI in education systems presents a wide range of opportunities and tools to enhance the effectiveness and accessibility of learning by introducing personalized and adaptive learning methods, AI promotes an extra innovative, inclusive, and efficient educational aspect, facilitating rapid, customized learning experiences. Its effectiveness in enhancing and developing higher education has been supported by numerous studies, including Borisov and Stoyanova (2024), who posited the main opportunities for applying AI in higher education are that AI techniques can be used to examine learning data to identify areas where teaching and learning can be improved, and Joshi and Tripathi who highlight the benefits of AI in higher education, emphasizing its ability to enhance student engagement, deeper connections with educational content, and facilitate interactive and engaging learning experiences for both students and educators ( Joshi & Tripathi, 2024).

The study's findings revealed that professors are interested in embracing new trends in higher education and investing in artificial intelligence technology, this is an important step in adopting this technology, as user acceptance of the technology is essential for the successful uptake of the devices (Kelly et al., 2023, p. 2). However, this will only be possible unless Algerian universities are prepared to provide the necessary infrastructure and finances and strive to train the human element in this field, taking into account the development of regulatory policies to exploit this technology. Identifying facilitating conditions linked to the supporting infrastructure and resources accessible for the techniques of AI as critical factors that can hamper or facilitate the assumption of AI technologies in higher education institutions ( Mohsin et al., 2024, p. 116).

The study found that educators have fears about the negative aspects of using AI technologies in higher education. Their concerns mainly revolve around the development of mental laziness, a decline in critical thinking, issues related to content ownership and transparency, excessive amounts of information hindering creative work, ethical and legal issues, bias and misleading algorithms, as well as the potential threat to personal data security. These results were largely consistent with the results of the study of Borislav Borisov and Stoyanova where educators express concerns about potential biases in AI systems, lack of transparency in decision-making, and the potential for over-reliance on AI, which could compromise critical thinking and human interaction. Additionally, the vulnerability of AI systems to cyber threats raises concerns about data security and system performance (Borisov & Stoyanova, 2024, p. 3).

Another aspect that this study explored is the majority of academic staff believe that the most important challenges facing the use of AI in higher education are the need for more

research on the types of data that should be used in AI models, negative attitudes towards AI among students and teachers, increasing inequality in education through the widening digital gap between students, and the lack of standardized and reusable digital educational resources for personalized and adaptive learning. To address these challenges, faculty members must be well-trained in the use of AI to provide learners with the skills needed to confront them. Likewise, human ethics must be highlighted when teaching AI, and privacy must be respected and protected through international regulations and laws ( Slimi, 2023, p. 30).

Based on the investigation's results, participants proposed the use of artificial intelligence techniques to develop various aspects of the educational process. These proposals include allocating the necessary budget to develop the use of artificial intelligence, providing training courses for university staff, establishing laws and regulations related to the ethics of artificial intelligence, and promoting the widespread adoption of artificial intelligence in Algerian universities.

## Conclusion

The current study aimed to shed light on the attitudes of Algerian faculty members towards the incorporation of artificial intelligence technologies in higher education. The results of the research revealed that Algerian professors are knowledgeable about the potential benefits of artificial intelligence in higher education. They focus on its ability to enhance the educational process and pedagogical content, as well as its contributions to personal support for students, effective organization, and continuous performance assessment.

Although AI holds tremendous potential in higher education, professors expressed negative attitudes about its impact on student engagement and critical thinking, ownership of content and transparency, excessive amounts of information that hinder creative work, ethical and legal issues, bias and misinformation in algorithms, as well as the potential threat to the security of personal data. This emphasizes the need to consider the ethical issues associated with it and to seek to plan, build, and follow a careful approach to integrating AI technologies in higher education. Future research should also develop strategies to address these concerns and ensure that AI is used effectively to improve learning in higher education.

The desire of professors to adopt AI technologies in higher education is evident, with a clear recognition of the challenges and limitations that can stand in the way of optimal exploitation of this technology. Among the most important challenges that emerged from professors' responses is a strong emphasis on the need for strong resources, comprehensive research, and effective training for professors and students to ensure the systematic, thoughtful, and successful integration of AI. To bridge this gap and successfully implement smart technologies, Algerian universities need to focus on addressing structural constraints, investing in human capital development, and ensuring the availability of adequate financial resources. This multi-faceted approach is critical to realizing the full potential of smart technologies within the Algerian higher education system.

## Recommendations

Based on the findings of this research paper, we can provide a set of recommendations that focus on integrating artificial intelligence into Algerian universities' higher education. However, this integration should not be done haphazardly, but rather through a systematic and purposeful strategy. This entails important steps such as effectively training faculty members on using artificial intelligence and equipping learners with the necessary skills to tackle future challenges in scientific research. Additionally, it is crucial to emphasize the establishment of an

ethical culture when teaching artificial intelligence, ensuring that privacy and dignity are respected and protected by international regulations and laws. Lastly, higher education institutions must effectively manage artificial intelligence by employing an integrated, multi-faceted approach to harness various AI technologies for the advancement of higher education.

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## Declaration of AI Refined

 This research paper has undergone language correction using Grammarly to address grammatical, spelling, and stylistic errors. It is acknowledged that the use of such tools may introduce standardized patterns typical of AI-generated content. Consequently, a certain percentage of content may reflect AI-generated language structures. Yet, the intellectual content and the analysis remain entirely the work of the authors.

## Statement of Absence of Conflict of Interest

 The authors mentioned above hereby solemnly declare that they are not and shall not be in any situation that could give rise to a conflict of interest in what concerns the findings and recommendations contained in this academic article.

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