



International Journal of Innovative Technologies in Social Science

e-ISSN: 2544-9435

Operating Publisher
SciFormat Publishing Inc.
ISNI: 0000 0005 1449 8214

2734 17 Avenue SW,
Calgary, Alberta, T3E0A7,
Canada
+15878858911
editorial-office@sciformat.ca

ARTICLE TITLE	FIELDS AND APPLICATIONS OF ARTIFICIAL INTELLIGENCE IN SCIENTIFIC RESEARCH
----------------------	---

DOI	https://doi.org/10.31435/ijitss.3(51).2026.6522
------------	---

RECEIVED	23 May 2026
-----------------	-------------

ACCEPTED	12 August 2026
-----------------	----------------

PUBLISHED	25 August 2026
------------------	----------------

LICENSE	
----------------	--



The article is licensed under a **Creative Commons Attribution 4.0 International License**.

© The author(s) 2026.

This article is published as open access under the Creative Commons Attribution 4.0 International License (CC BY 4.0), allowing the author to retain copyright. The CC BY 4.0 License permits the content to be copied, adapted, displayed, distributed, republished, or reused for any purpose, including adaptation and commercial use, as long as proper attribution is provided.

FIELDS AND APPLICATIONS OF ARTIFICIAL INTELLIGENCE IN SCIENTIFIC RESEARCH

Soumia Zerari

Dr., University of Oum El Bouaghi, Algeria

ABSTRACT

The current study aims to identify the conceptual framework of artificial intelligence and determine its fields. It also seeks to identify a range of artificial intelligence techniques and applications that benefit doctoral students and assist them in preparing scientific research. The study sample consisted of 51 doctoral students from universities in Algeria, while the questionnaire was used as the data collection instrument. The study results concluded that doctoral students use various artificial intelligence programs for different research purposes, the most important of which are translation and reference collection. Meanwhile, the level of students' use of these programs was found to be moderate, with users facing several challenges in their application, most of which are attributed to the cost of paid programs.

KEYWORDS

Artificial Intelligence, Artificial Intelligence Applications, Scientific Research

CITATION

Soumia Zerari. (2026) Fields and Applications of Artificial Intelligence in Scientific Research. *International Journal of Innovative Technologies in Social Science*. 3(51). doi: 10.31435/ijitss.3(51).2026.6522

COPYRIGHT

© The author(s) 2026. This article is published as open access under the **Creative Commons Attribution 4.0 International License (CC BY 4.0)**, allowing the author to retain copyright. The CC BY 4.0 License permits the content to be copied, adapted, displayed, distributed, republished, or reused for any purpose, including adaptation and commercial use, as long as proper attribution is provided.

1. Introduction

In recent years, remarkable developments have taken place with the emergence of artificial intelligence (AI) technologies. Artificial intelligence is a branch of computer science concerned with developing systems and technologies that enable machines and software to simulate and perform tasks of the human mind. AI has become one of the major topics in computer science, technology, economics, and society. It has been applied in numerous fields and is also used in the field of knowledge and scientific research across various research institutions. It contributes to accelerating the research process and reducing the time required to obtain results. It also helps identify patterns, classifications, and relationships in data more quickly and accurately than humans by analyzing the vast amounts of available data. Moreover, through the use of machine learning and statistical analysis techniques, it is possible to predict the potential outcomes of research experiments and test research hypotheses. AI-powered educational robots are also used to provide explanations and clarifications, answer students' questions, and provide exercises and tests to enhance the learning process.

In light of the above, it can be observed that artificial intelligence technologies have undergone tremendous development in the field of scientific research. They accelerate the pace of research, improve accuracy, and provide new insights. However, despite this development and speed, researchers face challenges in using these applications, such as maintaining scientific integrity and protecting intellectual property. Based on these considerations, the following questions are raised:

What applications can be used by doctoral students for scientific research purposes, and to what extent are they used?

1.1. Study Hypothesis:

This study proceeds from the following main hypotheses:

There is diversity in the use of artificial intelligence applications by doctoral students for scientific research purposes, with differences in their levels of use.

1.2. Study Objectives

Through the current study, we seek to achieve the following objectives:

- To identify some of the artificial intelligence applications available for scientific research.
- To clarify the objectives and uses of the artificial intelligence applications examined in the field of scientific research and the extent to which they are used by doctoral students.

1.3. Study Importance

The importance of this research is reflected in the following two dimensions:

- Highlighting the latest technological developments represented by artificial intelligence and their applications in the field of scientific research.
- This study constitutes an applied study aimed at preparing a reference guide for researchers on the use of artificial intelligence tools in scientific research, particularly in accordance with the standards and principles of scientific integrity and research ethics.

2. Definition of the Study Terms:

2.1. Concept of Artificial Intelligence:

Artificial intelligence is one of the important components of the technology industry in the present era, and it is a branch of computer science. The term consists of two parts: intelligence and artificial. The former refers to the ability to understand and comprehend new meanings, while the latter encompasses various elements that have been created through direct human intervention (Al-Maliki, 2023, p. 96).

Accordingly, artificial intelligence can be defined as an attempt to imitate human intelligence by enabling computers to think like humans through providing them with algorithms and processors that allow them to understand, analyze, and learn.

2.2. Types of Artificial Intelligence:

Artificial intelligence is divided into two main types:

- **Narrow Artificial Intelligence:** Also known as limited artificial intelligence, it is easy to understand and comprehend and is applied in various fields, particularly in Internet search engines, especially in relation to assisting with buying and selling processes and providing advice and guidance (Al-Sayed, 2023, p. 149).
- **Broad Artificial Intelligence:** It is characterized by a high capacity to collect and analyze information and learn from situations it encounters, enabling it to make decisions autonomously without human intervention. Examples include instant chatbots and personal assistant programs (Al-Asad, 2023, p. 168).

2.3. Fields of Artificial Intelligence:

The subfields in which artificial intelligence is currently applied have expanded and diversified in accordance with the various manifestations of human intelligence. Its presence can be observed in many aspects of our surroundings. Research has therefore focused on developing and designing various artificial intelligence programs for industrial, technological, medical, educational, service, and other fields, including the following:

- **Artificial Neural Networks:** This is one of the fields of artificial intelligence characterized by its ability to simulate the functioning of human nerve cells. It enables computers to learn and generalize by training artificial neural networks on a specific type of data, making them capable of predicting other data similar to the data on which they were trained.
- **Natural Language Processing:** This is a field of artificial intelligence characterized by its ability to facilitate interaction between humans and artificial intelligence by developing technologies capable of understanding or communicating in human language. These technologies respond to users' commands, such as performing a specific task, solving a particular problem, or storing a certain amount of data and information.
- **Genetic Algorithms:** This is a field of artificial intelligence that works to solve problems in an optimal manner by selecting the best solution from among thousands of available and possible solutions (Newfrasi Articles).

2.4. Some Artificial Intelligence Applications and Their Uses:

2.4.1. ChatGPT Technology:

ChatGPT is defined as a free-to-use chatbot powered by artificial intelligence, launched by OpenAI in November 2022. It is equipped with a large language model that enables it to generate original texts in response to requests submitted by users (Strzelecki, 2024, p. 5142).

The purpose of ChatGPT technology is to interact through conversation, which involves a series of questions from users and responses from the application. This creates a different experience compared with the use of search engines, which do not maintain an evolving history of answers. Instead, they return a list of separate links to resources based on the order of specific keywords used as search terms (Rospigliosi, 2023, p. 1).

ChatGPT, as an artificial intelligence technology, offers many advantages that make it a valuable tool in academic research. Its ability to process vast amounts of textual data within a short period saves researchers considerable time and effort. It also has the ability to automate many tasks that were previously performed manually by researchers, such as analyzing research papers by scanning them and extracting their key details (Dergaa, Chamari, Zmijewski, & Saad, 2023, p. 617).

The main advantages of employing this technology can be summarized as follows:

- Creating new opportunities and promising prospects for innovation and enhancing diversity in research perspectives.
- Providing researchers worldwide with easy access and use at any time, simply by connecting to the Internet.
- Assisting in generating new research ideas and enhancing researchers' productivity through summarization and writing assistance (Rahman, et al., 2023, p. 07).

2.4.2. EXPLORE AI Application:

This innovative technology enables users to search quickly and easily for answers within thousands of YouTube video clips. One of its main advantages is that users can quickly find the information they need without having to spend time searching across multiple websites. It is an artificial intelligence-based search engine that is fast and efficient and provides users with the most accurate results in a fraction of the time (aifinder.info).

2.4.3. CONSENSUS Application:

This technology leverages advanced artificial intelligence algorithms to extract, compile, and summarize data quickly and accurately. It can also be used to obtain a comprehensive overview of the latest research in a fraction of the time required for detailed research and analysis, as well as to receive a detailed analysis of data to support informed decision-making. It saves time and effort by quickly identifying the latest relevant information. On this basis, this technology can be considered a cognitive revolution in the way scientific data are accessed and interpreted through consensus (aifinder.info).

2.4.4. PAPERS GPT:

This technology enables users to process and comprehend any scientific paper, allowing it to develop a deep and personalized understanding while connecting different types of data. This technology has the potential to revolutionize the way we access and use information. It can be used to process large amounts of data quickly and accurately, as well as to create more accurate models and predictions and identify patterns and trends in data. It can also be used to develop more efficient and effective search algorithms, enabling users to quickly and easily find the information they need. We can therefore say that GPT can be used to make data more accessible and useful, allowing us to gain a better understanding of the world around us (aifinder.info).

3. Previous Studies:

3.1. Kwanlo Study (2023):

This study focused on enhancing the understanding of the extensive capabilities of ChatGPT technology and how it can be used in education, as well as the issues raised by researchers during the first three months following its release. The researcher analyzed the content of 50 articles retrieved from relevant databases. The study found that the performance of ChatGPT varied, ranging from outstanding in the field of economics to satisfactory in programming and unsatisfactory in mathematics. Despite the technology's ability to serve as an assistant to teachers and a virtual tutor for students by answering questions and facilitating collaboration among them, there are challenges associated with its use, foremost among which is the generation of incorrect and fabricated information.

3.2. Deland et al. Study (2023):

This study aimed to examine the current state of ChatGPT technology in natural language processing and similar models within academic settings, as well as their implications, particularly with regard to ethical issues in scientific production and publishing. The study found that the technology is viewed as a potential model for the automated preparation of articles and other types of manuscripts. This technology has the potential to significantly influence research writing and facilitate publication through its effective use of available data and its ability to generate language that closely resembles human language. It can also be used for translation, summarization, answering researchers' questions, and simplifying and formatting the citation process correctly and effectively. On the other hand, the study raised numerous concerns regarding this technology, particularly those related to the ethics of content ownership, compliance with copyright laws, and research evaluation.

4. Research Procedures:

4.1. Research Method:

The researcher employed the descriptive method in this study because it is appropriate for the objectives of the present research, as the study seeks to describe and diagnose a current phenomenon in society. The descriptive method is defined as a method that aims to collect data and attempt to test hypotheses or provide an answer that identifies and determines the subject as it is, by answering questions related to the current status of the individuals in the sample. A descriptive study identifies and determines the subject as it exists in reality (Othman, 1998, p. 29) (Othman & Hassan, 1998, p. 29).

4.2. Study Boundaries:

- **Geographical Boundaries:** Doctoral students at Algerian universities.
- **Temporal Boundaries:** The study was conducted during the period from February 5, 2026, to April 14, 2026.
- **Human Boundaries:** The study was conducted on a group of doctoral students pursuing their postgraduate studies in Algeria in general.

4.3. Study Population and Sample:

This study was conducted among the population of doctoral students in Algeria. The study was administered to a non-random convenience sample consisting of 51 male and female doctoral students enrolled at Algerian universities.

4.4. Study Instrument:

To collect the data necessary to achieve the objectives of the present study, the researcher developed an electronic questionnaire consisting of 25 items distributed across five dimensions: types of applications used, patterns of use, purposes of use, competence and skills, and challenges of use.

4.5. Psychometric Properties of the Study Instrument:

4.5.1. Assessing Construct Validity:

The correlation between each dimension and the total questionnaire score was calculated using Pearson's correlation coefficient.

Table 1. Distribution of Correlation Coefficients between the Dimensions of the Artificial Intelligence Applications Questionnaire and Its Total Score

Types of Applications Used	Usage Pattern	Purposes of Use	Competence and Skills	Challenges of Use	Total Score
0.91	0.87	0.89	0.91	0.83	1.00

Significance level = (0.01)

Source: Prepared by the Researcher

The results presented in the table above indicate that the correlation coefficients between the five dimensions of the Artificial Intelligence Applications Questionnaire and the total score are statistically significant at the 0.01 significance level. The coefficients were very high, ranging from 0.83 as the lowest value for the Challenges of Use dimension to 0.91 as the highest value for the Types of Applications Used and Competence and Skills dimensions. The intermediate values were 0.87 for the Pattern of Use dimension and 0.89 for the Purposes of Use dimension. These results indicate that the questionnaire is valid and suitable for administration and use.

4.5.2. Assessing Discriminant Validity:

Discriminant validity was assessed through an extreme-groups comparison between the mean scores of the upper 27% of the score distribution of the standardization sample, which consisted of 32 male and female doctoral students, and the mean scores of the lower 27% of the same distribution. Accordingly, $N = 32 \times 0.27$, which is approximately 9. Therefore, the number of participants in the upper and lower groups was 18 in total. The difference between the two groups was tested using an independent-samples t-test. The results are summarized in the following table:

Table 2. Results of the Discriminant Validity of the Study Instrument

Sample (N = 16)	Arithmetic Mean	Standard Deviation	T Value	Sig. Value	Significance Level
Lower Scores	21.33	2.89	tc = 26.91	0.00	0.01
Upper Scores	36.58	4.61			

Source: Prepared by the Researcher according to (Firdaws & Khammar, 2025, p.11) from Table 01 that there are statistically significant differences between the mean scores of the upper and lower groups, with a significance value (Sig.) of 0.00 at the 0.01 significance level. This indicates that the study instrument has the ability to discriminate between participants with high scores and those with low scores. Therefore, the study questionnaire demonstrates a high degree of discriminant validity.

4.5.3. Assessing Reliability Using Cronbach's Alpha:

Table 3. Results of the Reliability of the Study Instrument

Cronbach's Alpha Reliability Coefficient
0.87

Source: Prepared by the Researcher according to (Zedira Khammar, et al, 2025, p.6)

5. Presentation and Discussion of the Study Results:

5.1. Presentation of the Study Results:

5.1.1. Presentation of the Results for the Dimension of Types of Applications Used:

Table 4. Results for the Dimension of Types of Applications Used in Scientific Research among Doctoral Students

Types of Applications Used	Usage Rate
ChatGPT	83%
Explore AI	22%
Consensus	64%
Papers GPT	71%
Research Rabbit	31%
Elicit	61%

Source: Prepared by the Researcher

The results presented in the table above indicate that ChatGPT ranks first in terms of usage among doctoral students, with a high rate of 83%, followed by Papers GPT at 71%, Consensus at 64%, and Elicit at 61%, which are relatively high percentages. In contrast, Research Rabbit recorded a rate of 31%, while Explore AI ranked last at 22%, which may be explained by its lower popularity or its limited compatibility with students' research needs.

5.1.2. Presentation of the Results for the Dimension of Patterns of Using Artificial Intelligence Applications in Scientific Research:

Table 5. Results for the Dimension of Patterns of Using Artificial Intelligence Applications in Scientific Research

Usage Pattern	Daily	Weekly	Monthly
Once	43%	49%	62%
More than once	18%	21%	54%

Source: Prepared by the Researcher

The table shows that the pattern of application use among doctoral students varies according to the time period. Regarding daily use, 43% of the students reported using the applications once a day, while 18% used them more than once on the same day. As for weekly use, 49% reported using them once per week, while 21% used them more than once per week. Regarding monthly use, 62% reported using them once per month, while 54% used them more than once per month.

5.1.3. Presentation of the Results for the Dimension of Competence and Skills in Using Artificial Intelligence Applications in Scientific Research:

Table 6. Results for the Dimension of Competence and Skills in Using Artificial Intelligence Applications in Scientific Research

Competence and Skill Level in Using Artificial Intelligence Applications in Scientific Research	Percentage
Beginner	11%
Intermediate	63%
Proficient	47%

Source: Prepared by the Researcher

The table shows the level of competence and skills among doctoral students in using artificial intelligence applications in scientific research. The percentage of beginners was only 11%, while the intermediate group accounted for 63%. In contrast, the percentage of proficient students reached 47%, reflecting the presence of a considerable number of students who possess a high level of competence and advanced ability to benefit from artificial intelligence applications in scientific research.

5.1.4. Presentation of the Results for the Dimension of Purposes for Using Artificial Intelligence Applications in Scientific Research:

Table 7. Results for the Dimension of Purposes for Using Artificial Intelligence Applications in Scientific Research

Purposes of Use	Usage Rate
Reference Collection and Management	71%
Translation	78%
Statistical Analysis and Data Processing	34%
Academic Writing and Editing	25%
Presentation Preparation	56%

Source: Prepared by the Researcher

The table indicates that the most common purpose is translation, with a rate of 78%, followed by reference collection and management at 71%. The use of applications for preparing presentations accounted for 56%, while the rates of use for statistical analysis and data processing and academic writing and editing were 34% and 25%, respectively, which are lower than the preceding percentages.

5.1.5. Presentation of the Results for the Dimension of Challenges Encountered in Using Artificial Intelligence Applications in Scientific Research:

Table 8. Results for the Dimension of Challenges Encountered in Using Artificial Intelligence Applications in Scientific Research

Challenges Encountered	Percentage
High Cost of Paid Software	54%
Difficulty Accessing Applications	5%
Lack of Training	27%
Language Difficulties	8%
Lack of Time for Learning	23%
Poor Internet Connectivity	48%

Source: Prepared by the Researcher

The results presented in the table indicate the challenges faced by doctoral students when using artificial intelligence applications in scientific research. The high cost of paid software accounted for 54%, while poor Internet connectivity represented 48%. Lack of training accounted for 27%, and lack of time for learning accounted for 23%. Meanwhile, the challenges of language difficulties and difficulty accessing applications recorded relatively low percentages of 8% and 5%, respectively.

5.2. Discussion and Interpretation of the Study Results:

The results of the present study show that the use of artificial intelligence applications by doctoral students in scientific research has become a clear phenomenon. ChatGPT ranked first among the most widely used tools, with a rate of 83%, followed by Papers GPT at 71% and Consensus at 64%. This finding is consistent with the theoretical framework discussed above regarding the widespread adoption of narrow and broad artificial intelligence applications, particularly those designed for natural language processing and text generation, as ChatGPT represents an advanced model that combines processing speed with human-like interactive capabilities (Strzelecki, 2024). This finding is also consistent with the study by Deland et al. (2023),

which highlighted the significant role of ChatGPT in facilitating academic writing and generating ideas, as well as the study by Kwanlo (2023), which confirmed its widespread adoption despite the challenges related to reliability.

Regarding patterns of use, the results showed that daily use of artificial intelligence tools is common among a considerable proportion of students. However, a significant proportion of students rely on these tools on a weekly or monthly basis. This pattern reflects the nature of academic research, which may not require continuous daily reliance on such tools. At the same time, it indicates that these applications have become repeatedly integrated into the research workflow. This can be linked to the previously discussed finding that artificial intelligence is used flexibly across multiple fields and that researchers may resort to it at specific stages, such as data collection or text editing.

Regarding the level of competence and skills, the results showed that the majority of students, 63%, were at the intermediate level, while 47% were at the proficient level, compared with only 11% at the beginner level. These findings indicate that a broad segment of students has practical experience with these tools. This is consistent with the ease of access to many applications and with the nature of certain applications, such as Consensus and Papers GPT, which do not require advanced technical knowledge while still providing academic results.

Regarding purposes of use, translation ranked first at 78%, followed by reference management at 71% and presentation preparation at 56%. In contrast, the percentages for statistical analysis (34%) and academic writing (25%) were lower. This can be explained by the fact that students prefer to employ these applications for tasks that consume considerable administrative and linguistic time and effort, while analytical and creative tasks remain more closely associated with researchers' expertise and personal skills. This finding is consistent with the study by Deland et al. (2023) concerning the use of ChatGPT for translation and summarization, as well as with the previously discussed observation that certain fields of artificial intelligence, such as genetic algorithms and advanced analytics, require specialized knowledge.

With regard to the challenges encountered when using these applications, the main challenges were the high cost of paid software (54%) and poor Internet connectivity (48%), followed by limited training opportunities (27%) and lack of time (23%). Language difficulties accounted for 8%, while difficulty accessing applications accounted for only 5%, making these the least common challenges. These findings are consistent with the study by Kwanlo (2023) concerning the technical and organizational obstacles faced by users. They also highlight the importance of improving digital infrastructure and providing training programs for researchers.

Based on the foregoing, it can be concluded that the findings of the present study support the increasing adoption of artificial intelligence applications in academic settings, with variations in the level of competence, patterns of use, and purposes of use. They also reveal the existence of technical and financial challenges that require institutional solutions to ensure the sustainable and more effective use of these tools in scientific research.

6. Conclusions:

In conclusion, it can be inferred that, despite the tremendous revolution that artificial intelligence has brought about in technology in general and scientific research in particular—from generating research ideas to providing access to and exploring various databases, obtaining the information needed by researchers within a short period, accessing and documenting previous studies, and benefiting from translation, data collection, processing, and analysis in accordance with the adopted methodology—it remains a double-edged sword. Researchers must therefore use these technologies responsibly and ethically and adhere to the principles of scientific integrity and research ethics, as established by the relevant authorities.

In light of the findings presented above, the following recommendations are proposed:

- Artificial intelligence applications should be used in scientific research as supportive tools while adhering to the principles of scientific integrity and research ethics.
- The researcher recommends that these applications be used with caution and regarded merely as supportive tools in the research process, rather than being relied upon entirely.

The use of artificial intelligence applications does not eliminate other research methods; rather, it complements and strengthens them and increases the opportunities for benefiting from them more effectively.

REFERENCES

1. Al-Asad, S. (2023). Artificial intelligence: Opportunities, risks, and reality in Arab countries. *Economic Additions Journal*, 7(1), 165–184.
2. Al-Maliki, W. F. (2023). The role of artificial intelligence applications in enhancing educational strategies in higher education (literature review). *Journal of Educational and Psychological Sciences*, 7(5), 93–107.
3. Al-Sayed, N. S. (2023). Artificial intelligence is one of the technical tools used in advertising design as a source of creativity and inspiration. *The Arab International Journal of Art and Digital Design*, 2(3), 143–167.
4. Dergaa, I., Chamari, K., Zmijewski, P., & Saad, H. B. (2023). From human writing to artificial intelligence generated text: Examining the prospects and potential threats of ChatGPT in academic writing. *Biology of Sport*, 615–622.
5. Hafiane, F., & Khammar, Z. (2025). Organizational commitment and its relationship to quality of work life in local administration: A case study of Guelma. *International Journal of Innovative Technologies in Social Science*, 1(45). [https://doi.org/10.31435/ijitss.1\(45\).2025.3140](https://doi.org/10.31435/ijitss.1(45).2025.3140)
6. Othman, O. H. (1998). *University theses and research: Writing on methodology*. Al-Shayab Publications.
7. Rahman, M., Terano, H. J., Rahman, N., Salamzadeh, A., & Rahaman, S. (2023). ChatGPT and academic research: A review and recommendations based on practical examples. *Journal of Education, Management and Development Studies*, 3(1), 1–12.
8. Strzelecki, A. (2024). To use or not to use ChatGPT in higher education? A study of students' acceptance and use of technology. *Interactive Learning Environments*, 5142–5155.
9. Khammar, Z., Kouachi, N. E. H., Boumedjane, Z., Amejouj, H., & Mabrouki, S. (2025). The impact of digitization on administrative creativity: A field study in an Algerian public institution. *International Journal of Innovative Technologies in Social Science*, 2(46). [https://doi.org/10.31435/ijitss.2\(46\).2025.3372](https://doi.org/10.31435/ijitss.2(46).2025.3372)