

The Degree of Use of Graduate Students on Artificial Intelligence Tools in Scientific Research

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Abstracts

The aim of the current research is to try to identify the degree of use of graduate students for artificial intelligence tools in scientific research, the research has relied on the descriptive analytical approach and has been preparing a questionnaire consisting of 20) single applied to (163) graduate students at the College of Education at King Khalid University (94) of master's students and (69) of doctoral students, The research found that the degree of graduate students' use of artificial intelligence tools in scientific research was average by (58%), with an arithmetic average of (3.32). The results of the opinions of the sample members on the second Dimentions related to the challenges came the total estimate of the Dimentions was high by (71%), with an arithmetic average of (3.86) and the highest challenges related to the fact that the use of tools is for a financial fee, and the results also indicated that there are no statistically significant differences in the degree of turnout of graduate students at the College of Education, King Khalid University, and the challenges they face in the use of artificial intelligence tools in scientific research due to the gender variable, while there are statistically significant differences due to the program level variable. In light of this, the research recommended training students on the use of artificial intelligence tools in scientific research, educating students about the ethics of scientific research and controls for the use of artificial intelligence in scientific research, integrating the topics of artificial intelligence applications in a seminar course for master's students.

Keywords: B Graduate Students - Artificial Intelligence Tools - Scientific Research

1. Introduction

The development and development of contemporary societies is affected by the degree of their use of technological resources and artificial intelligence, and education in general and higher education in particular is one of the most important pillars on which nations and societies are

based, as higher education institutions contribute to a key role in maximizing the cognitive ability of society in research, use and application through the exercise of its activities of teaching, disseminating and producing knowledge, community service and applying knowledge (Saliha. 2014. 10)

The knowledge society requires special capabilities and skills and superior capabilities that prepare individuals to interact with its renewed challenges, and it only comes through upgrading the level of performance of individuals in all institutions, especially educational, as education and scientific research are the driving force driving social and economic creativity in the future, and in order for universities to keep pace with rapid and successive changes, it is necessary to pay attention to scientific research as one of the important and vital functions of the university, on the basis of its outputs, the university can occupy an important position among international universities in International classifications.

Artificial intelligence techniques are modern technologies that are concerned with the production of knowledge by acquiring, storing, processing, interpreting and investing in solving problems and providing new services (Al-Lozi, 2012)

The study of Ahmed and Hussein (2023) showed that self-learning is one of the most ways to acquire knowledge of artificial intelligence tools, at 47.9%, and the most important tools used in searching for information were Google scalar, 54.7%, and the most important artificial intelligence tools used in searching within files and texts, data search, by 47.2%.

Qutb (2023) also stressed that there has been a significant and noticeable increase in the number of studies interested in discovering artificial intelligence applications in writing scientific research, especially in the medical field, and the United States of America was the most productive of these researches. Despite the significant benefits of this technology, studies have emphasized the need to develop ethical and ethical guidelines for its use in scientific writing. Finally, a comprehensive classification of applications that can be used at all stages of writing scientific research was presented. Based on the results of the current research, research gaps and future exploratory trends can be identified, which are expected to be of great value to academics and practitioners alike, and the study of Al-Saidi (2024) recommended, the most important of which is directing scientific publishing institutions to rely on artificial intelligence in classifying research studies and developing policies and systems related to scientific publishing to comply with artificial intelligence applications and educating researchers about the importance of adhering to the ethics of scientific research, Gawish's study (2024) concluded that it is necessary to develop the researcher's skills in dealing with artificial intelligence applications, mastering artificial intelligence tools, and the need to master the practical and applied aspects, and not be satisfied with the theoretical aspect.

On the other hand, the study of Al-Matrafi (2024) found that most of the parties agreed not to consider the ChatGPT model as an author, but rather as an auxiliary tool for researchers, and the research recommended the need to pay attention to developing guidelines and principles to control generative artificial intelligence in scientific research and to educate researchers about the importance of the human element in the use of artificial intelligence and in the need to adhere to the ethics of scientific publishing and intellectual property rightsThe study of Abu Eyada and

Odaibat (2023) was also concerned with building proposed ethical standards to employ artificial intelligence in scientific research to achieve ethical use efficiently and effectively, manage current ethical crises, solve problems in creative ways, and recommended planning to transform the future of scientific research in a smart way by creating a smart environment to keep pace with the changes of the current era, and Coley (2023) points out in his research paper, which dealt with the ethical challenges of artificial intelligence, the need to raise awareness, adopt appropriate legislation and consolidate ethical values, and this would enhance Scientific research and the protection of educational systems, and therefore the current research was interested in identifying the degree of use of graduate students at the College of Education, King Khalid University, for artificial intelligence tools in scientific research.

Research problem:

Scientific research represents one of the basic requirements for the progress of nations and peoples, and thanks to the efforts of researchers and scientists, man has achieved tangible progress in various fields, and the emergence of artificial intelligence has had an impact on the education and scientific research sector, as the capabilities possessed by artificial intelligence, which are similar to human capabilities such as reasoning, problem solving, thinking and knowledge generation, contributed to the development of scientific research and the development of its outputs, Perhaps this requires attention to developing the skills of researchers and graduate students and enabling them with artificial intelligence tools to benefit from them in completing their research, and both Ali and Yassin (2016) indicated that artificial intelligence began with the development of scientific research methods and that researchers must be trained and qualified to use artificial intelligence tools. Scientific research policies and ethics of artificial intelligence within the framework of the Fourth Industrial Revolution. Requirements for qualifying university professors to work in AI-enabled education, and empowering them with the new digital skills necessary for the academic, educational and administrative uses of AI. From here, the current research sought to try to answer the following main question: What is the reality of the use of graduate students at the College of Education, King Khalid University, for artificial intelligence tools in scientific research?

Research Questions

1. What is the degree to which graduate students at the College of Education, King Khalid University, use artificial intelligence tools in scientific research?
2. What is the degree of challenges facing graduate students at the College of Education, King Khalid University, in using artificial intelligence tools in scientific research?
3. Are there statistically significant differences in the degree of use of artificial intelligence tools by graduate students at the College of Education, King Khalid University, and the challenges they face in this due to the gender variable?
4. Are there statistically significant differences in the degree of use of graduate students at the College of Education, King Khalid University, and the challenges they face in using artificial intelligence tools in scientific research due to the degree variable?

Objectives: The current research aims to try to identify:

1. The degree of use of graduate students at the College of Education, King Khalid University, on the use of artificial intelligence tools in scientific research
2. Challenges facing graduate students at the College of Education, King Khalid University, in using artificial intelligence tools in scientific research.
3. Differences in the degree of use of artificial intelligence tools by graduate students at the College of Education, King Khalid University, in scientific research and the challenges they face in that due to the gender variable
4. The differences in the challenges they face in using artificial intelligence tools in scientific research and the challenges they face in that are due to the degree variable

Important:

- 1- The current research is concerned with highlighting the importance of using artificial intelligence tools in scientific research in accordance with the ethical controls specified for this
- 2- The current research contributes to the preparation of a form for artificial intelligence tools used in scientific research to know the degree of use of graduate students at the College of Education, King Khalid University, for artificial intelligence tools in scientific research, and may be useful in developing mechanisms to address the challenges facing graduate students at the College of Education in the use of artificial intelligence tools in scientific research.

Terminologies:

Scientific research is an organized way to discover a problem for the purpose of publishing and correcting knowledge, whether that knowledge is theoretical or scientific, and with the aim of finding explanations for the mysterious phenomena (Firas and Al-Sreera, 2011, 15)

Artificial intelligence tools : smart programs and applications based on advanced algorithms of artificial intelligence, helping users to solve real-world problems, and these tools are specialized, and directed towards customized functions, and in our study are various programs and applications that are based on artificial intelligence and benefit the researcher in the field of social sciences and humanities at all stages of her research. (Abbas, 2024, 244)

The current research defines it as a set of efforts to design and develop computer programs and systems for its applications in cognitive science, computer science, natural interfaces and smart machines that think intelligently in the same way that intelligent humans think, can behave in a similar way to humans, and can learn natural languages. Actual tasks in integrated coordination

Artificial intelligence: Artificial intelligence (AI) is an advanced technology that aims to enable devices and systems to think, learn and make decisions similar to humans (Al-Kawar. 2023)

Limitations of the study:

Human limits: The current research was limited to a sample of graduate students at the College of Education

Objective limits: The current research was limited to trying to identify the degree of use of artificial intelligence tools by graduate students at the College of Education, King Khalid University, and the challenges they face in that.

Spatial limitation: College of Education

Time limits: The questionnaire was applied in the first semester of 1446-2024

Sample: 163 graduate students (Master and PhD) at the College of Education, King Khalid University

2. Theoretical Framework:

The rapid development of artificial intelligence (AI) has led to radical changes in many fields, including scientific research. AI is known for its ability to process and analyze large amounts of data quickly and accurately, accelerating the research process and developing new ideas based on strong data foundations.

Applications of artificial intelligence in scientific research

Artificial intelligence has multiple roles in scientific research, as Meyer et al., (2023) pointed out that artificial intelligence tools, especially chatgpt, have a major role in academic writing, and these tools can be referred to at several stages of writing scientific research, starting from generating ideas, setting the initial lines of research, ending with writing, editing and agreeing to the conditions of scientific publishing institutions, in addition to that these tools facilitate the process of translating long texts accurately and as distinct from Google Translate, which is often In addition, it provides multiple options for translation style, whether academic professional and others (Hwang et al., 2023), in addition to the possibility of editing the writings of researchers by correcting spelling and grammatical errors, which contributes to improving the quality of writing and reducing errors (Geher, 2023)

It also contributes to the prevention of plagiarism by examining texts and comparing them with big data from sources to detect exact similarities and matches and to detect reworked materials (Liu et al, 2023).

Artificial intelligence helps accelerate scientific discovery and innovation. Allows data to be analyzed more efficiently and experiments are designed in time-saving ways and increases the productivity of scientific research and the spread of new knowledge Artificial intelligence enhances the quality of research processes and the reliability of results. Enables researchers to produce more accurate and reliable studies. This contributes better to the development of scientific knowledge (The use of artificial intelligence in writing research and studies,

Artificial intelligence tools in scientific research:

Artificial intelligence tools are one of the most important technological developments that have been developed recently and have an important role in all areas of life, including scientific research, as the use of artificial intelligence tools in scientific research constitutes a qualitative leap in traditional research methodologies, as it enhances the ability of researchers to use and

analyze huge amounts of data quickly and accurately, meeting the needs of researchers in collecting and understanding big data. AI can also offer advanced methods for analyzing this data, extracting complex patterns and trends that are invisible to the naked eye. For example, in the field of biological sciences, AI can be used to analyze genomics and identify associations between genes and diseases very quickly, enabling researchers to better guide treatment strategies. In physics and chemistry, AI can be used to predict physical behaviors and chemical reactions based on available data. In addition, AI can help researchers design more expensive and effective experiments and improve measurement and analysis methods. This allows researchers to achieve better and faster results, thus accelerating the pace of scientific progress. All of this makes AI an essential tool in promoting scientific research by enabling researchers to reach new levels of analysis and understanding in various academic disciplines (Newcity, 2023)

The applications of artificial intelligence in scientific research include multiple fields such as:

1. **Big Data Analysis:** AI can analyze huge sets of data, allowing researchers to understand patterns and trends that may be hidden from the human eye.

According to a study by Lee and Chen (2020), many medical and environmental researches rely on AI tools to analyze big data and accelerate scientific progress.

2. **Predictive Modeling:** Artificial intelligence allows building predictive models that help researchers test their hypotheses and explore potential outcomes before conducting complex or costly experiments.

In a study by Johnson (2019), the researcher noted that artificial intelligence helps develop predictive models in areas such as climate and medical research to provide reliable initial visualizations to plan future experiments.

3. **Help with literature review and scientific writing:** Many AI-based tools rely on natural language processing (NLP) techniques to search scientific databases and provide abstracts and literature reviews.

In this context, Brown and Taylor (2021) noted that AI techniques have helped researchers identify the most important sources based on the content of scientific research in a fast and efficient way..

The New First website (July 22, 2023) identified the top 10 tools for artificial intelligence in academic research as follows:

Scite Assistant is an AI-powered research tool that helps find, read, and understand scientific literature. Automatic extraction of basic information from papers. Help identify relevant paperwork, track their progress, and collaborate with others.

Consensus is an AI-powered search engine that enables a researcher to: Find relevant research papers using machine learning. Extracting the results and extracting them directly from scientific research. Research scientific results only through published peer-reviewed sources.

Elicit is an AI research assistant that helps in: write, search, find relevant information without an exact match with keywords, create presentations for interim and final seminars. Assist in brainstorming, summarizing and classifying the text.

Semantic Scholar is an academic search engine powered by artificial intelligence, and prioritizes scientific content useful in: analyzing research papers, extracting important information, issuing relevant recommendations, researching relevant work, identifying new research trends, keeping abreast of the latest developments, organizing papers into dedicated folders, creating public folders and sharing them with others.

Quill Bot One of the AI writing tools Helps to: Create high-quality content using NLP algorithms and .Rephrase the text in a more sophisticated and professional way. and Improves text fluency and readability.

Grade scope is an AI-powered ranking tool, widely used in educational institutions, that helps reduce the time and effort required to grade assignments, exams, and coding projects by automating the process. Decipher, handwriting recognition and providing students with in-depth feedback through its machine learning algorithms. Get detailed analyses and statistics for each question and each assessment base to understand learners' performance.

Research Rabbit is an artificial intelligence tool that helps researchers manage their research. Such as tracking citations, creating references, and creating abstracts of papers. Use charts as new starting points for deeper research.

Chat PDF is an artificial intelligence tool that enables automatic extraction of text from PDF files, translation of languages, and answering questions related to content. And secure cloud file storage is never shared.

ChatGPT is an AI chatbot with which you can do the following: create text, translate languages, and answer questions. And derive intellectual conclusions based on logical evidence and evidence. And discover linguistic errors in the texts presented in terms of morphological, grammatical and spelling rules.

Perplexity is an AI-powered search engine with powerful academic search capabilities that help in: Provide a list of relevant questions and references and access a variety of different sources. Extracting information from the Internet and various scientific sources WolframAlpha, YouTube, Reddit

Challenges associated with the applications of artificial intelligence in scientific research: Despite the huge potential that artificial intelligence offers in scientific research, there are significant challenges that must be faced:

1. The need for big and accurate data:

AI algorithms rely heavily on data quality. According to Smith and Johnson (2020), incomplete or biased data can lead to unreliable research results.

2. High costs of systems development:

Building advanced AI systems can be expensive and require significant technical and human resources. As Lee and Chen (2020) point out, these costs can be a barrier for researchers and small enterprises.

3. Privacy and security issues:

The use of artificial intelligence requires the handling of large amounts of personal and sensitive data, which raises questions about how to protect this data. According to Miller and Davis (2019), challenges associated with protecting data privacy are among the biggest obstacles to the spread of AI in sensitive research areas such as medicine.

In light of the above, it can be said that artificial intelligence applications show great potential in improving the effectiveness of scientific research and providing innovative solutions to traditional research challenges. However, challenges associated with data, costs, and privacy must be taken into account to ensure that the technology is most out of it.

3. Study Methodology and Procedures

Methodology: The current research used the descriptive analytical approach by referring to the literature and previous studies related to the subject in order to analyze and benefit from them in a way that contributes to describing the current phenomenon and helping to build the theoretical framework and the current research tool to reach an answer to the research questions and provide several recommendations.

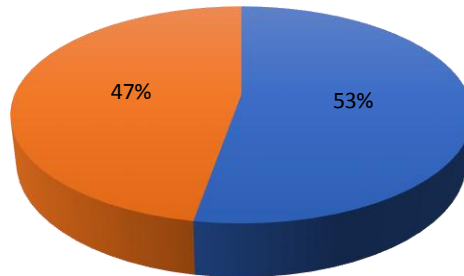
Description of the population and sample of the study:

Study population:

(B) **Study sample:** A stratified random sample selected from the community of all students registered at King Khalid University to obtain master's or doctoral degrees, and the community has been divided into layers according to the variables of the study, which include (gender male / female, degree master's / doctorate), and has been distributed as in the following table and drawings:

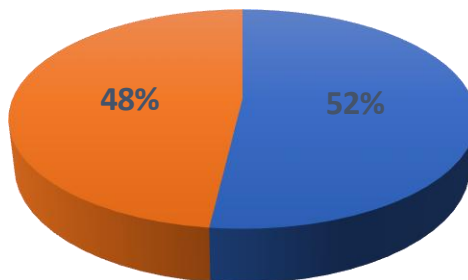
Statement	Table No. (1) Sample Description by Variables			
	genre		Degree	
	males	females	Master Students	PhD students
Number	77	86	94	69
Ratio	%47	%53	%58	%42
Total	163		163	

Pie Chart (1) Illustrating the Distribution of the Sample by Gender Variable



- Males 47%
- Females 53%

Pie Chart(2) Illustrating the Distribution of the Sample by Academic Degree Variable



- Master's holders: 48%
- PhD holders: 52%

Data collection Tool:

A list of artificial intelligence tools used in scientific research has been prepared from the relevant literature and previous studies and has been limited and formulated on the five-way Likert and its phrases have reached (10) phrases whose responses have been determined as follows (I do not need them, weak, medium, large, very large) to take the values (1, 2, 3, 4, 5). Then it presented it

to a group of arbitrators to ensure its sincerity in terms of content and to ensure its importance to graduate students, and the amendments were made, whether by deletion or addition, in light of the arbitrators' proposals, and then they became applicable to them. In addition to a questionnaire to identify the challenges facing graduate students at the College of Education, King Khalid University, in the use of artificial intelligence tools in scientific research, and its phrases reached (10) phrases whose responses were determined as follows (strongly disagree, disagree, medium, disagree, strongly disagree) to take the values (1, 2, 3, 4, 5).

Statistical study of the questionnaire:

After the arbitration of the questionnaire and the amendment of what is in it based on the recommendations of the arbitrators to amend, delete and add, the researchers conducted an exploratory study on it, which included (30) items, in order to ensure the honesty and stability of its tools statistically, and its statistical validity for the current study, and the result was:

Honesty:

(a) Structural honesty (internal consistency) of the two axes of the Questionnaire :

We note that all the links of the items of the two axes, namely (the demand for the use of artificial intelligence, which numbered (10), and the Dimensions of the challenges of using artificial intelligence (10) items, are acceptable high, as they were limited between (.369 and .735), which prompted the researcher to adopt them all in both axes, and thus all the approved questionnaire items become (20) equally between the two axes. See Table (2) and Table (2).

Table No. (2) shows the internal consistency of the Dimensions of the Questionnaire turnout and updates

N	Correlation	N	Correlation	N	Correlation	N	Correlation
1	.531	6	.489	1	.513	6	.532
2	.630	7	.590	2	.540	7	.396
3	.604	8	.405	3	.369	8	.530
4	.501	9	.708	4	.428	9	.672
5	.735	10	.692	5	.458	10	.383

(b) Self-honesty of the two axes:

It means the product of the square root of the stability coefficient of Alvakrönbach, and looking at the values of stability, we find that the subjective honesty of the two axes: (the demand for the use of artificial intelligence, and the Dimensions of the challenges of using artificial intelligence), where it reached respectively (.935.- .900), which are acceptably high values, confirming their subjective validity and therefore the suitability of both for use in the present study. See Table 2.

Stability of the two axes of the Questionnaire :

(a) Vcronbach stability:

The researchers extracted the value of the stability of Alpha Cronbach, for the two axes of the Questionnaire (the demand for the use of artificial intelligence, and the Dimentions of the challenges of using artificial intelligence), where it reached for both respectively (.875 - .811), which is a high value and therefore acceptable, which indicates the stability of the two axes and thus their suitability for use in the current study. See Table 2.

Stability of half segmentation:

The researchers extracted the value of the stability of the scale by the half-segmentation method in two ways, Spearman-Brown and Getman method, for the two axes of the Questionnaire (the demand for the use of artificial intelligence, and the Dimentions of the challenges of using artificial intelligence), where it reached for the two methods (.851, .846), (.732 , .721) respectively, which are high values, and therefore acceptable, which indicates that the two scales are at a high level of stability see Table (4).

Table No. (3) shows the validity and stability of their different types of Questionnaire axes

Questionnaire Dimensions	Deleted items	Number of items approved	Alfakronbach stability coefficient	Self-honesty	Half-retail stability	
					Spearman-Brown	Getman
Turnout	None	Terms (10)	.875	.935	.851	.846
Challenges	None	Terms (10)	.811	.900	.732	.741

Statistical treatments:

The researchers used several statistical treatments to process his data, using the Statistical Package for Social Sciences (SPSS) program, and she chose from that:

1. Arithmetic averages: to extract percentages and estimates
2. The percentage equation of the mean: in order to extract the percentage at the level of the single, and the equation is as follows: $(\text{average} - 1) \div 2 \times 100$
3. Schedule of Judging and Evaluation Criteria: To make judgment and estimate percentages, which is as follows:

Table 4 Governance and Evaluation Criteria Table

Ratio	%20 -%1	%40 -%21	%60 -%41	%80 -%61	81% - 100%
value	Very low	Low	Medium	high	Very high

4. Two-sided T.Test: to detect differences between binary groups

Fourth: Presentation and discussion of results (a) Presentation and drawing conclusions

The first question: What is the degree to which graduate students at the College of Education, King Khalid University, use artificial intelligence tools in scientific research?

To answer this question, the averages, standard deviations, percentage and estimation for this Dimentions were extracted and the result was as follows:

table (5) shows the ranks, percentages and estimate of the dimensions of demand for the use of artificial intelligence

number	Vocabulary of the reality of the use of graduate students on artificial intelligence tools in scientific research	rank	arithmetic mean	standard deviation	percentage	value
1	Find and get sourcesgoogle scalar- elic it al reseach -publish or perish (pop)	(3)	3.61	1.07	65.25%	high
2	Data search /talk to book /text generation	(6)	3.24	1.13	56%	Medium
3	ACADEMIC WRITING AND PARAPHRASING essay bot/rytr/kattab	(9)	3.00	1.08	50%	Medium
4	STATISTICAL ANALYSIS OF DATA excel/ imp spss/ sas	(4)	3.39	1.17	59.75%	Medium
5	Spelling grammarly/ heming way/ moda oio	(8)	3.15	1.17	53.75%	Medium
6	GOOGLE translate/ translator universal speech	(2)	3.63	1.06	65.75%	high
7	Demos and mind maps mindiy aps .com/ context minds/ elic it/ microsoftpowerpoint	(5)	3.28	1.17	57%	Medium
8	File formatting and merging i love pdf	(1)	3.84	1.10	71%	high
9	AUTOMATICALLY EXTRACT TEXT FROM pdf files TRANSLATE , LANGUAGES, AND ANSWER 1 QUESTIONS RELATED TO CHAT gpt content	(7)	3.17	1.18	54.25%	Medium
10	Rephrase the text in a more sophisticated .and professional wayQuillbot	(10)	2.91	1.16	47.75%	medium
Percentages and total estimation of thedimentions of employment demand			3.32	1.12	58%	medium

Looking at the table, which included percentages and estimates in the items of the Dimentions of graduate students' use of artificial intelligence in scientific research, we note that the percentages of some items came in the range of high estimation rates, which are items No. (1, 6, 8), meaning that they were limited between (60% - 80%), while the rest of the items, which are (2, 3, 4, 5, 7, 9, 10) came in the range of medium estimation, meaning that they were limited between (40% - 60%), and we note that the lowest percentage It came for item No. (10), where it reached (47.25%), with an arithmetic average of (2.91), which included (reformulating the text in a more sophisticated and professional way. QuillBot) while the highest percentage came for item (9), where it reached (71%, with an arithmetic average of (3.84), which included (file format and merging I LOVE PDF). Accordingly, the overall estimate of the Dimentions in the estimation range was medium (58%), with an arithmetic mean (3.32). It is a result that is close to the result of Al-Sayyad and Al-Salem (2023), which showed that the use of artificial intelligence tools by female students of the College of Education at King Saud University in scientific research is

weak, and perhaps this result is due to The novelty of students' knowledge of artificial intelligence tools and their uses in scientific research, in addition to the lack of training on the use of these tools

The second question: What are the challenges facing graduate students at the College of Education, King Khalid University, in using artificial intelligence tools in scientific research?

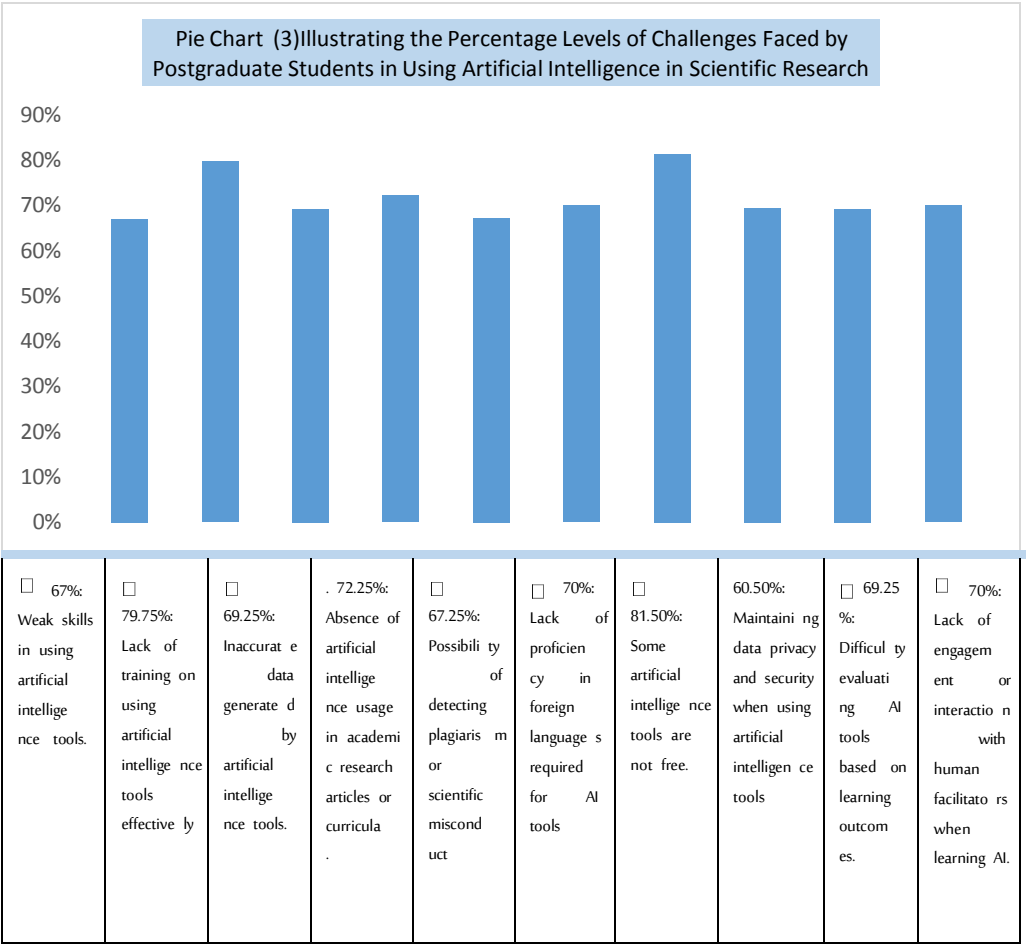
To answer this question , the averages, standard deviations, percentage and estimation for this Dimention were extracted and the result was as follows:

Table (5) shows the ranks, percentages and estimation of the challenges of using artificial intelligence

number	Vocabulary of the Dimention of the challenges of using graduate students on the use of artificial intelligence in scientific research	Rank	Arithmetic mean	Standard deviation	Percentage	Appreciation
1	Poor skills using artificial intelligence tools	(8)	3.68	1.01	67%	high
2	Lack of training in the use of artificial intelligence tools	(2)	4.19	.89	79.75%	high
3	Inaccuracy of data generated by the use of these tools	(6)	3.77	.87	69.25%	high
4	Research methods courses did not include the topics of using artificial intelligence tools in scientific research	(3)	3.89	1.00	72.25%	high
5	The possibility of detecting plagiarism and scientific thefts	(7)	3.69	.91	67.25%	high
6	Lack of foreign language	(4)	3.80	1.08	70%	high
7	Some tools are not free	(1)	4.26	.79	81.5%	Very high
8	Maintain privacy and information security	(5)	3.78	.87	69.5%	high
9	Difficulty assessing the effectiveness of AI tools in enhancing learning outcomes	(6)	3.77	.83	69.25%	high
10	Lack of human interaction	(4)	3.80	.92	70%	high
Percentages and total estimation of theDimention of demand for the use of artificial intelligence			3.86	.91	71.5%	high

Looking at the table, which included percentages and estimates in the items of the challenges facing the use of artificial intelligence by graduate students in scientific research, we note that the percentages of one item came in the range of very high estimation rates, which is item No. (7), meaning that it was limited between (80% - 100%), and while the rest of the items in the range of appreciation came high in the sense that it was limited between (60% - 80%), and we

also note that the lowest percentage came to item No. (1), where It reached (67%), with an arithmetic average of (3.68), which included (poor skills in using artificial intelligence tools), while the highest percentage came for item (7), where it reached (81.5%), with an arithmetic average of (4.26), which included (some tools are not free). Accordingly, the overall estimate of the Dimentions in the range of the estimate was high (71%), with an arithmetic mean (3.86). It indicates that there are challenges facing graduate students at the College of Education, King Khalid University in using artificial intelligence tools in scientific research, challenges of a high degree due to the lack of a course in artificial intelligence and the failure to provide training courses related to the employment of artificial intelligence applications in scientific research and the lack of some students to master the English language



The third question: Are there statistically significant differences in the reality of using graduate students at the College of Education, King Khalid University, and the challenges they face in using artificial intelligence tools in scientific research due to the gender variable?

To answer this question, a two-sided (T) test was used for differences, averages and standard deviations, and the result was as follows:

Table (5) shows the result of the two-sided (T) test for differences in use demand and challenges attributed to the gender variable

Variable	Samples	Sample size	Arithmetic mean	SD	Median	Value (T)	P-value	Significance
The reality of using artificial intelligence tools	Male	77	33.75	6.49	161	.722	.471	Non-Significance differences
	Female	86	32.91	8.38				
Challenges of use	Male	77	38.12	5.36		-.811	.419	Non-Significance differences
	Female	86	38.83	5.36				

Looking at the table above, Note The differences in the two axes (the degree of use of artificial intelligence, and the Dimensions of the challenges of using artificial intelligence) between males and females are not statistically significant, as the values of (T(calculated (.722., -.811) respectively, which are non-significant values at the lowest significance level 05., where their p-values were in the same series (.471, .419) So the result: (There are no statistically significant differences in The degree of turnout of graduate students at the College of Education, King Khalid University and the challenges they face in The use of artificial intelligence tools in scientific research attributed to the type variable).

Fourth question: Are there statistically significant differences in the degree of use of artificial intelligence tools by graduate students at the College of Education, King Khalid University, and the challenges they face in using artificial intelligence tools in scientific research due to the degree variable?

Table (5) shows the result of the two-sided (T) test for differences in use demand and challenges attributed to the gender variable

Variable	Samples	n	Mean	SD	median	Value (T)	P	Significance
The use of artificial intelligence tools in scientific research	Master	94	31.07	8.34	161	-4.67	.000	The differences are indicative in favor of the doctorate
	Doctor	69	36.17	5.57				
Challenges of use	Master	94	39.37	5.27		2.27	.025	The differences are a function in favor of the masters
	Doctor	69	37.46	5.32				

To answer this question, the researcher uses a two-sided (T) test for differences, averages and standard deviations, and the result was as follows:

Looking at the table above, we notice that the differences in the two axes (the demand for the use of artificial intelligence, and the Dimensions of the challenges of using artificial intelligence) between master's and doctoral students are statistically significant, as the calculated (T) values (-4.67, 2.27) respectively, which are significant values at the level of significance 01., 05. respectively, where their probability values reached the same series (.000., .025), and it is noticeable considering the averages that the differences in the first Dimensions are the demand for use in favor of doctoral students, while the differences in the second Dimensions are in favor of master's students.

4. Discussion and interpretation of the results:

Discussion of the first result: ((The degree of use of graduate students at the College of Education, King Khalid University, on artificial intelligence tools in scientific research is medium))

The overall estimate for this Dimensions was in the average estimate range by (58%), with an arithmetic average of (3.32). It is a result that converges from the result of Al-Sayyad and Al-Salem (2023), which showed that the use of artificial intelligence tools by female students of the College of Education at King Saud University in scientific research is weak, and perhaps this result is due to the novelty of students' knowledge of artificial intelligence tools and their uses in scientific research, in addition to the lack of training on the use of these tools

Discussion of the second result: ((Graduate students at the College of Education, King Khalid University, face high degree challenges))

The overall estimate of the Dimensions in the range of the estimate was high by (71%), with an arithmetic mean of (3.86). It indicates that there are challenges facing graduate students at the College of Education, King Khalid University, in using artificial intelligence tools in scientific research. High degree challenges due to the lack of a course in artificial intelligence and the failure to provide training courses related to employing artificial intelligence applications in scientific research and the lack of some students to master the English language

Discussion of the third result: ((There are no statistically significant differences in the degree of use of graduate students at the College of Education, King Khalid University, and the challenges they face in using artificial intelligence tools in scientific research due to the gender variable)).

The results indicate the confirmation of this hypothesis, as there are no statistically significant differences in the degree of turnout of graduate students at the College of Education, King Khalid University, and the challenges they face in using artificial intelligence tools in scientific research due to the gender variable, and this confirms that both males and females have a medium degree of use of artificial intelligence applications, which buys the need to support students in this aspect and provide training courses that enable them to safely use these applications.

Discussion of the fourth result: (((There are statistically significant differences in the degree of use of graduate students at the College of Education, King Khalid University and the challenges they face in the use of artificial intelligence tools in scientific research attributed to the degree

variable in favor of doctoral students in turnout and in favor of master's students in the Dimensions of use challenges).

The results indicate that there are statistically significant differences in the degree of turnout of graduate students at the College of Education, King Khalid University, and the challenges they face in using artificial intelligence tools in scientific research due to the variable of the level of the academic program in favor of doctoral students in use and for the benefit of master's students in the Dimensions of use challenges, and perhaps this is due to the presence of experience among doctoral students greater than master's students in the use of artificial intelligence tools in scientific research. He stresses that master's students see more challenges.

5. Conclusion and Recommendations

The use of artificial intelligence in scientific research has become an urgent necessity to keep pace with the rapid changes in the technical field in addition to accelerating scientific research processes and improving its outputs, and this requires a conscious transformation with many challenges facing researchers in dealing with these tools with ethical commitment, as well as dealing with challenges related to their inability to use artificial intelligence tools in scientific research.

Recommendations: In the results, the current research recommends the following:

- 1- Training students on the use of artificial intelligence tools in scientific research
- 2- Educating students about the ethics of scientific research and the controls for the use of artificial intelligence in scientific research
- 3- Integrating AI Applications Topics into a Seminar Course for Master's Students
- 4- Develop a mechanism to provide the use of artificial intelligence applications under the umbrella of the university to meet the cost challenge for students
- 5- Educating students on how to deal with AI applications in a way that ensures confidence in the data to be obtained

Future Studies Proposals: The current research proposes the following studies:

- 1- Conducting a study on the extent of students' commitment to the controls for the use of artificial intelligence in scientific research from the point of view of faculty members
- 2- Conducting a study on students' opinions on the degree of confidence in the data issued by artificial intelligence
- 3- Conducting a study of the concerns of the use of artificial intelligence from the point of view of faculty members

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