

The Role of Artificial Intelligence in Academic Achievement and Scientific Research Among University Students: A Field Study on a Sample of Students from The Department of Sociology at Souk Ahras University

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Abstract:

This study aims to shed light on one of the most prominent technological innovation of the last decade, represented by Artificial Intelligence (AI), and the transformations it has brought about upon entering the educational and scientific research of university students, considering that these tools provide students with diverse methods for exam preparation, supported by simulated questions. Furthermore, they facilitate the review and summarization of lectures, not to mention providing smoother and easier scientific research methods; it's often sufficient for a student to pose questions in a correct, comprehensible, and simplified format to find what they are looking for with the click of a button. To this end, we conducted this research on a sample of 120 students from the Department of Sociology at Souk Ahras University, relying on a questionnaire as a research tool and employing the descriptive approach to analyze and interpret the results of this study.

Keywords: Artificial Intelligence; Academic Achievement; Scientific Research.

1. Introduction:

Artificial intelligence stands as one of the most prominent human innovations of our contemporary era, owing to its multiple functional capabilities, which have confined many daily human and programmatic tasks to a single command directed at one of its specific tools, across various sectors. The higher education and scientific research sector has not remained isolated from this development; rather, it has become one of the most important social systems affected by these intelligent technologies, which have transcended their traditional role as auxiliary tools to become an active element in the production, organization, and circulation of knowledge. Numerous tools concerned with the educational dimension of students' work have emerged, some of which assist in summarization, others in explanation and analysis, and others still in providing instructional models and exercises. Consequently, the integration of artificial intelligence tools into the academic system has imposed a new educational reality, one that has reshaped the concepts and mechanisms of academic achievement among university and postgraduate students. These technologies have enabled personalized learning environments consistent with each student's individual capacities, providing immediate quantitative and qualitative access to global sources of knowledge, on the one hand, and equipping researchers and students with advanced capabilities in Big Data Analytics and highly rapid

and precise literature review, in addition to the automation of numerous complex procedural processes, on the other.

Algerian students in general, and students of Mohamed Cherif Messaadia University in the wilaya of Souk Ahras in particular, are among the university students who may use artificial intelligence tools throughout the academic year in their scientific and academic trajectory. This prompts us to investigate the extent to which such use is effective in their academic achievement as well as their research activities, through the following research questions:

- **Does artificial intelligence contribute to performing a cognitive function within the university system by enriching the university student's scientific and cognitive fund?**
- **Does artificial intelligence contribute to performing a cognitive function within the university system by enhancing the quality of scientific research among university students?**
- **Does artificial intelligence play a functional role in adequately preparing university students for examinations?**

The study also relied on a set of hypotheses, as follows:

- **There are no statistically significant differences regarding artificial intelligence and academic achievement and scientific research among university students at the significance level of 0.05 attributable to the gender variable.**
- **There are no statistically significant differences regarding artificial intelligence and academic achievement and scientific research among university students at the significance level of 0.05 attributable to the academic level variable.**

2. Objectives of the Study:

Every scientific study has specific objectives that the researcher seeks to achieve, and defining them precisely enables us to gain control over the subject to be studied. Since the subject of our research encompasses a set of diverse variables some classical, such as academic achievement and scientific research, and others contemporary, such as artificial intelligence we shall attempt, through this research, to achieve the following set of scientific objectives:

- To enrich the bibliographic dimension related to the study's variables.
- To enrich scientific research by delving deeply into the study's variables, with the aid of scientific research instruments conducive to this end, such as the questionnaire.
- To uncover the nature of the relationship between artificial intelligence and academic achievement and scientific research among university students.
- To uncover the effect of the student's gender on their use of artificial intelligence, or lack thereof.
- To uncover the effect of the student's academic level on their use of artificial intelligence, or lack thereof.
- To bring this subject down from its theoretical framework to empirical reality, subjecting it to empirical investigation.

3. Concepts of the Study:

3.1. Artificial Intelligence:

The United Kingdom, in accordance with the National Security and Investment Act of 2021, defined artificial intelligence as the technology enabling a machine to be programmed or trained, or to perceive environments, through the use of data, to interpret data by means of automated processing designed to approximate cognitive capacities, and to provide recommendations or decisions with a view to achieving a specific objective. (The National Security and Investment Act, 2021)

The World Intellectual Property Organization (WIPO) defines it as a discipline of computer science aimed at developing machines and systems capable of performing tasks that require human intelligence, with limited or no human intervention. (Guimberteau & Harwood, 2023, p. 87)

It is also defined as a branch of computer science concerned with how machines simulate human behavior, being the science of creating computer devices and programs capable of thinking in the same manner as the human brain operates learning as we learn, deciding as we decide, and acting as we act. (Ahmed, 2022, p. 22)

Artificial intelligence, then, is that branch of computer science which aims to train computerized electronic machines to acquire processing capacities and to perform tasks similar to and emulative of human performance, such that they acquire the ability to generate ideas and solutions to problems and subsequently address them, according to a pattern akin to its human counterpart.

3.2. Academic Achievement:

Academic achievement is defined as a system of knowledge, skills, and attitudes acquired by the student through learning various academic subjects over the course of the year, expressed by the final average of all academic subjects obtained by the student at the end of the academic term. (Al-Awad, 2005, p. 8)

It is also the acquisition of information, skills, and modes of thinking, along with the modification of attitudes and values and the adjustment of adaptive methods, encompassing both desirable and undesirable outcomes. (Al-Jalani, 2011, p. 23)

It is likewise defined as: "a scholastic effort attained by the individual through educational, scholastic, and training practices within the scope of an educational field, thereby realizing the extent of benefit the learner has derived from the lessons and the educational, pedagogical, and training guidance given or prescribed to them". (Faliyah & El-Zaki, 2004, pp. 72-73)

Academic achievement, therefore, is the sum total of knowledge and skills acquired by the learner as a result of receiving them in the form of academic subjects, imparted over a specified period of time within an academic term, in accordance with a pre-established program.

4. Previous Studies:

4.1. First Study: Study by Mohammed Hamad Al-Otal et al. (2021): "The Role of Artificial Intelligence (AI) in Education from the Perspective of Students of the College of Basic Education in the State of Kuwait": (Al-Otal & al, 2021, pp. 30-64)

This study aimed to identify the significance of artificial intelligence technology in the educational process from the perspective of students of the College of Basic Education in the State of Kuwait, by uncovering the challenges facing the use of artificial intelligence technology, as well as identifying differences between the mean scores of the study sample regarding the significance of

artificial intelligence technology in the educational process and the challenges facing its use according to the variables of (gender, academic year, cumulative GPA). The study followed the descriptive method, with the study population consisting of students of the College of Education, from which a sample of 229 male and female students was drawn. The study employed a questionnaire comprising 34 items. Among the most notable findings, the study revealed the significance of artificial intelligence technology in the educational process according to the academic year variable, while no differences were found regarding the challenges facing its use in education according to this variable. The results further indicated the existence of differences regarding the challenges facing the use of artificial intelligence technology in education according to the gender and cumulative GPA variables, whereas no differences were found regarding its significance in the educational process according to these variables.

4.2. Second Study: Study by Noha Abdel Karim Ahmed Abdel Baqi (2022): "The Effectiveness of an Artificial Intelligence-Based Learning Environment in Developing Achievement, Decision-Making Skills, and Attitude Toward Technology among Female Students of the College of Education at King Khalid University in Light of Kolb's Model": (Abdel Hakam Ahmed Abdel Baqi, 2022, pp. 2-45)

The present study aimed to identify the effectiveness and impact of an artificial intelligence-based learning environment, in light of Kolb's model, in developing academic achievement, as well as in developing decision-making skills and attitude toward technology among female students of the College of Education at King Khalid University.

To achieve the objectives of the research, the quasi-experimental method was applied using two groups: a control group consisting of (30) female students and an experimental group consisting of (32) female students, employing an achievement test, a decision-making scale, and an attitude-toward-technology scale as research instruments.

The results revealed a statistically significant difference at the significance level (0.05) between the mean scores of the female students of the experimental group, who studied within the artificial intelligence-based learning environment in light of Kolb's model, and the scores of the female students of the control group, who were taught by the traditional method, in each of the achievement test, decision-making skills, and attitude toward technology.

The results also revealed a statistically significant difference in the level of effect of the independent variable the artificial intelligence-based learning environment in light of Kolb's model on each of the dependent variables: cognitive achievement, decision-making, and attitude toward technology.

5. Theories Explaining the Study:

5.1. Structural Functionalism Theory:

Structural functionalism is among the most renowned and widely prevalent sociological theories in this field, owing to its solid premises and arguments, which contribute to the scientific study of social phenomena. Structural functionalism is simultaneously an old and a modern orientation; we find it rooted in the ideas and research of early thinkers, beginning with Plato and Ibn Khaldun, and extending to the works of Talcott Parsons in the modern era (Gharbi & Guelouaz, 2016, p. 184), among others such as Robert Merton and Radcliffe-Brown, all of whom were influenced by

the positivist thought prevailing since the beginning of the nineteenth century, which upholds science and empirical logic. They therefore likened society to a living organism composed of interrelated parts, each part performing a function assigned to it, thereby contributing to achieving the integration of the overall system and ensuring its equilibrium.

In its deconstruction of the structure of society and the functions it performs, and in its analysis of social phenomena and the interconnectedness of the functions generated thereby, structural functionalism relies on the concept of Structure the part or element of which any system, unit, or social structure is composed and function the role and contribution provided by each part within the overall structure (Al-Hawat, 1998, p. 96). Accordingly, the social phenomenon is the product of the structural parts that emerge within its midst, possessing a social function that is in turn linked to the functions of other phenomena resulting from the remaining parts constituting the social structure; society is thus structure and function, each complementing the other. (Thompson & al, 1997, pp. 254-283)

Despite the diversity of scholars' views on the concept of functionalism, they nonetheless converge on certain propositions which, taken together, constitute the theoretical formulation of functionalism in sociology. Van den Berghe confined these concepts to seven propositions, namely: (Van den Berghe, 1963, p. 696)

- A holistic view of society as a system comprising a set of interrelated and integrated parts.
- Since society consists of interrelated and integrated parts, causality is multiple and reciprocal.
- Although integration is never absolute, social systems are subject to a state of dynamic equilibrium.
- Dysfunctions and functional deficiencies do indeed exist within the system and may persist for a long period; ultimately, however, they tend to achieve equilibrium of their own accord, this being the end toward which such social systems tend, although they are unable to achieve it fully, striving toward it only relatively.
- Change occurs in a gradual, adaptive manner rather than suddenly or revolutionarily.
- Change emanates from three sources: the adaptation and accommodation of the system to external changes, growth resulting from functional differentiation, and renewal and innovation.
- The fundamental factor in creating social integration lies in consensus on values.

Our reliance on the functionalist perspective in this study stems from the premise that the university, as a social institution, is thereby regarded as a social system whose function is the production of knowledge and the preparation of cadres and personnel, as well as scientific production and the construction of scientific research, with a view to achieving functional integration with the remaining social systems, such as the economic system and the political system. Artificial intelligence tools are but a subsystem within the educational system represented by the university; and its performance of its function namely, assisting students in their academic and scientific achievement and its development can elevate this social system (education) and contribute to its continuity and to the continuity and equilibrium of the overall social system.

6. Methodological Procedures of the Study:

6.1. Method Employed:

If method "is a set of general rules for arriving at the truth in the sciences, or is the path leading to the discovery of truth in the sciences by means of a set of general rules that govern the course of the mind and determine its operations in order to arrive at a known conclusion, and it is the instrument for testing hypotheses, bearing the burden of their development and verification" (Abdel Hamid, 2000, p. 15), this means that it is indispensable for any scientific research.

The descriptive method is the method that corresponds to the nature and requirements of the research, particularly in its aspect connected to **the survey method**, which has proven its efficacy in studying people's positions, attitudes, and opinions regarding the various issues, subjects, and phenomena they experience in their daily lives. (Al-Sayyid, 1994, p. 210)

The adoption of **the descriptive method** in this study is due, primarily, to its being regarded as the principal and standard form of data collection when the study encompasses the general population or a large sample of such a size that it becomes difficult to reach its individual units, given the vastness of its scope and the abundance of its units which is precisely what is required in our study, "The Role of Artificial Intelligence in Academic Achievement and Scientific Research among University Students: A Field Study on a Sample of Sociology Department Students at Souk Ahras University."

6.2. Data Collection Instruments:

The instrument we employed for collecting field data in this study is a **scale questionnaire**, as it suits the purpose of the study, firstly, and given the characteristics it possesses that facilitate the saving of time and effort for both the researcher and the respondent, secondly. The questionnaire is "a printed form containing a set of questions, directed at a sample of individuals, concerning a particular subject or subjects related to the topic of the study". (Abdel Hamid, 2000, p. 353)

6.3. Validity Testing of the Instrument:

Table (01): Shows the data regarding: Total values

		N	%
Cases	Valid	120	100,0
	Excluded ^a	0	,0
	Total	120	100,0

Source: Outputs of the statistical processing by SPSS software

Table (02): Shows data on measuring instrument validity using the Cronbach's Alpha reliability-validity coefficient

Reliability Statistics	
Cronbach's Alpha	N of Items
,849	26

Source: Outputs of the statistical processing by SPSS software

The table above shows that the value of Cronbach's alpha reliability coefficient exceeds 0.7, and thus the reliability rate of the questionnaire exceeded 70%, whereby the questionnaire is accepted.

6.4. Study Sample:

The sample in scientific research "is the part selected by the researcher, according to specific methods, to represent the research population in a sound scientific manner." The sampling method is used in research in cases of large populations whose units number in the thousands and millions, where conducting the study by means of a comprehensive census becomes impracticable. (Ben Morsli, 2003, p. 170)

Since the population of university students is large and consists of strata such as academic year, specialization, and cycle, we shall select the sample on the basis of cycle (Bachelor's–Master's); accordingly, the appropriate sample for the study is **the stratified random sample**, this type of sampling being employed in heterogeneous populations whose units are distinguished according to specific characteristics, such as the educational level of the units of the study population, gender, and type of specialization, whereby the study population may be divided into strata according to divisions differing fundamentally from one another in terms of the characteristic underlying their division. (Delyou & al, 2012, p. 169)

Accordingly, the study sample consisted of 120 units male/female students to whom the questionnaires were distributed according to **an equal distribution** 60 Bachelor's/60 Master's, and we were able to retrieve all of them.

6.5. Domains of the Study:

6.5.1. Spatial Domain:

This study was conducted within the Department of Sociology at Mohamed Cherif Messaadia University Souk Ahras, Algeria, which was established as a university center of a scientific, cultural, and professional character, enjoying legal personality and financial autonomy, pursuant to Executive Decree No. 01-279 dated 30 Jumada al-Thani 1422 AH, corresponding to 30 September 2001, which determined the number of institutes as 2 (the Institute of Science and Technology; the Institute of Legal Sciences). The above executive decree was subsequently amended by amending and supplementing Decree No. 06-282 dated 21 Rajab 1427 AH, corresponding to 16 August 2006, which determined the number of institutes constituting the Souk Ahras University Center and their respective specializations as follows: (Institute of Science and Technology; Institute of Legal and Administrative Sciences; Institute of Arts and Languages; Institute of Economic and Commercial Sciences and Management Sciences; Institute of Natural and Life Sciences). Subsequently, Executive Decree No. 245/12 dated 4 June 2012 was issued, providing for the establishment of Souk Ahras University, and determined the number of faculties and institutes constituting Mohamed Cherif Messaadia University of Souk Ahras as follows: (Faculty of Science and Technology; Faculty of Natural and Life Sciences; Faculty of Arts and Languages; Faculty of Social and Human Sciences; Faculty of Economic and Commercial Sciences and Management Sciences; Faculty of Law and Political Science; Institute of Agricultural and Veterinary Sciences; Institute of Physical Education and Sports Sciences). (Official Website of Souk Ahras University, 2026)

6.5.2. Temporal Domain:

The study was conducted over the period extending from 28/05/2026 to 13/07/2026, through the distribution of questionnaires to the research sample, the clarification of certain questions in cases of ambiguity for the respondent, and the collection of as many of them as possible at a subsequent

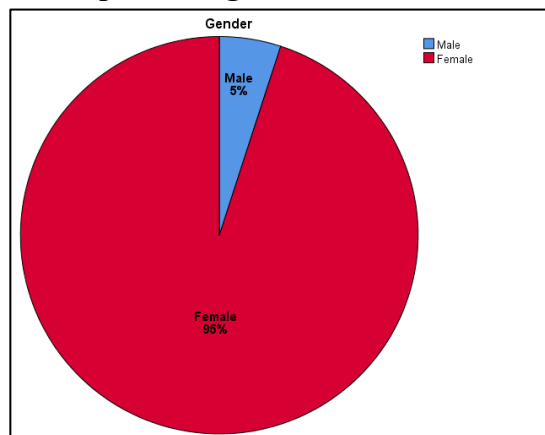
stage, followed by their statistical processing using SPSS software, version 26.0, culminating in the analysis and scientific interpretation of these statistical outputs in accordance with the literature of the discipline.

7. Field Study:

7.1. Presentation and Analysis of Data:

7.1.1. Presentation and Analysis of Data of the First Axis: Personal Data (Sample Characteristics)

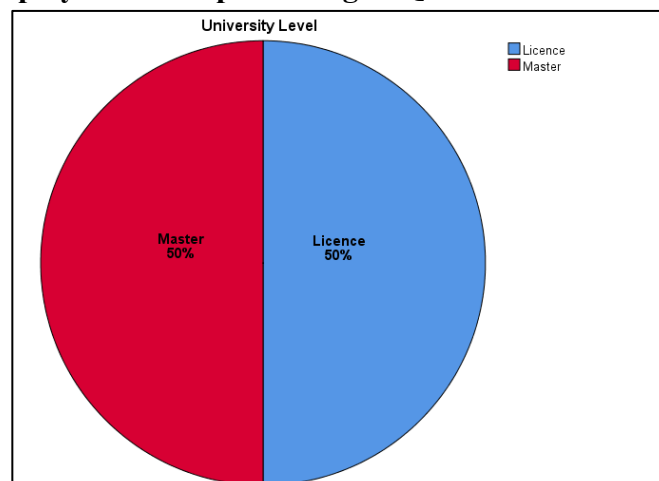
Figure (01): Displays the data pertaining to Question 1: Student gender



Source: Outputs of the statistical processing by SPSS software

The data presented in the figure above reveals that male students constitute a proportion of (5%) of the total sample size, while the proportion of female students was (95%) percentages we consider logical when viewed in light of the educational reality prevailing in Algeria, which the Algerian individual often links directly to the economic dimension, given that most young males typically seek economic opportunities at an early age, prompting them either to discontinue or suspend their studies. This is not to mention the nature of the specializations and their relationship to the physiological and psychological aspects of the male gender, which generally inclines them toward opting for technical specializations at the expense of literary and humanities specializations, such as the specialization of the students constituting the sample, namely sociology.

Figure (02): Displays the data pertaining to Question 2: Student academic level



Source: Outputs of the statistical processing by SPSS software

According to the statistical data presented in the figure above, the proportion of both Bachelor's and Master's students was equal (50%), which is logical, given that the study sample represented by the stratified random sample requires drawing the same number of units from each level.

7.1.2. Presentation and Analysis of Data of the Second Axis: Artificial Intelligence and the Enrichment of the Student's Scientific and Cognitive Fund

Table (03): Displays the data pertaining to the second dimension: Artificial Intelligence and enhancing student's scientific and cognitive repertoire

No	Item		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
3	Artificial intelligence helps me understand complex academic concepts quickly.	Frequency	26	86	5	3	0
		Percent	21,7%	71,7%	4,2%	2,5%	% 0
4	Artificial intelligence enhances my skills in searching for scientific sources.	Frequency	25	56	21	16	2
		Percent	20,8%	46,7%	17,5%	13,3%	1,7%
5	Artificial intelligence contributes to increasing my motivation to study.	Frequency	17	45	28	26	4
		Percent	14,2%	37,5%	23,3%	21,7%	3,3%
6	Artificial intelligence improves my ability to formulate scientific research objectives.	Frequency	16	75	17	11	1
		Percent	13,3%	62,5%	14,2%	9,2%	0,8%
7	I feel an increase in my comprehension capacities thanks to artificial intelligence.	Frequency	19	50	27	21	3
		Percent	15,8%	41,7%	22,5%	17,5%	2,5%
8	Artificial intelligence provides models and examples of research methodologies.	Frequency	29	74	12	5	0
		Percent	24,2%	61,7%	10,0%	4,2%	0,0%
9	Artificial intelligence enhances my creativity in formulating research problems.	Frequency	23	64	20	13	0
		Percent	19,2%	53,3%	16,7%	10,8%	0,0%
10	Artificial intelligence improves my understanding of scientific theories in my specialization.	Frequency	33	62	12	12	1
		Percent	27,5%	51,7%	10,0%	10,0%	0,8%

Source: Outputs of the statistical processing by SPSS software

The statistical reading of the data presented in the table above reveals the following:

We observe from the data presented in the table that a proportion of (71.7% and 21.7%) of the sample members respectively agreed and strongly agreed with the statement "Artificial intelligence helps me understand complex academic concepts quickly," which indicates that the student resorts to artificial intelligence in general, particularly with respect to the fundamental concepts of their

specialization, in order to facilitate their understanding of the scientific content specific to sociology, in addition to acquiring a sociological scientific lexicon.

We also observe that (46.7% and 20.8%) of the sample members respectively agreed and strongly agreed with the statement "Artificial intelligence enhances my skills in searching for scientific sources," which is explained by the fact that artificial intelligence reinforces students' classroom instruction in methodological unit courses, given that it provides answers to the majority of methodological problems within the specialization, supported by examples, in a scientific manner grounded in genuine references, it being sufficient for the student merely to formulate the question within an appropriate framework.

As for the statement "Artificial intelligence contributes to increasing my motivation to study," it was agreed upon by a proportion of (37.5%), while (23.3%) remained neutral, meaning that artificial intelligence contributed to some extent to motivating students to study owing to the information and research methods it provided them; however, what draws attention in the responses of the study sample is that a considerable proportion remained neutral, which may be explained by the fact that artificial intelligence, given its research, formatting, and information-generation capabilities, may engender dependency among students and stifle the critical thinking that leads a student to question, investigate, compare, and select.

With regard to the statement "Artificial intelligence improves my ability to formulate scientific research objectives," it was agreed upon by a proportion of (62.5%) of the sample members, which is explained by students' reliance on artificial intelligence at this stage of the research process; students are thus aware of the advantages of these tools and their capacity to assist the student at every stage of their academic achievement and scientific research.

A proportion of (41.7%) of the sample members agreed with the statement "I feel an increase in my comprehension capacities thanks to artificial intelligence," meaning that artificial intelligence contributed to simplifying information and ideas for the student, in addition to explaining and summarizing lessons and lectures.

In the following statement, which reads "Artificial intelligence provides models and examples of research methodologies," (61.7%) of the sample members agreed; as previously mentioned, artificial intelligence has the capacity to discuss methodological issues in a reliable, scientific manner, substantiated by genuine scientific references.

We also observe that (53.3%) of the sample members agreed with the statement "Artificial intelligence enhances my creativity in formulating research problems," which indicates the contribution of artificial intelligence to improving the quality of students' scientific research, including the methodological dimension, students having acknowledged that their reliance on it produced in them enhanced capacities for formulating the research problem.

The sample members likewise agree with the statement "Artificial intelligence improves my understanding of scientific theories in my specialization" at a rate of (51.7%), which indicates, as previously mentioned, that artificial intelligence has the capacity to explain and simplify prescribed lectures and lessons, in addition to substantiating them with further examples and scientific references, thereby granting the student a deeper and more comprehensive grasp of the content of the subject matter studied.

7.1.3. Presentation and Analysis of Data of the Third Axis: Artificial Intelligence and the Enhancement of the Quality of Scientific Research among University Students.

Table (04): Displays the data pertaining to the third dimension: AI and enhancing university students' scientific research quality

No	Item		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
11	I use artificial intelligence to summarize scientific references in research.	Frequency	29	63	10	16	2
		Percent	24,2%	52,5%	8,3%	13,3%	1,7%
12	Artificial intelligence reduces the time spent writing university research papers.	Frequency	40	55	14	10	1
		Percent	33,3%	45,8%	11,7%	8,3%	0,8%
13	Artificial intelligence assists in the analysis of statistical data for research.	Frequency	26	62	19	10	3
		Percent	21,7%	51,7%	15,8%	8,3%	2,5%
14	I rely on artificial intelligence to improve the quality of my university research.	Frequency	19	76	14	10	1
		Percent	15,8%	63,3%	11,7%	8,3%	0,8%
15	Artificial intelligence assists in the statistical analysis of university research.	Frequency	26	55	23	15	1
		Percent	21,7%	45,8%	19,2%	12,5%	0,8%
16	Artificial intelligence supports collaboration in collective research projects.	Frequency	21	55	31	10	3
		Percent	17,5%	45,8%	25,8%	8,3%	2,5%
17	Artificial intelligence assists in translating foreign scientific references.	Frequency	39	64	9	6	2
		Percent	32,5%	53,3%	7,5%	5,0%	1,7%
18	I prefer using artificial intelligence over traditional research methods.	Frequency	25	32	38	22	3
		Percent	20,8%	26,7%	31,7%	18,3%	2,5%
19	Artificial intelligence can replace traditional libraries in scientific research.	Frequency	19	19	26	37	19
		Percent	15,8%	15,8%	21,7%	30,8%	15,8%

Source: Outputs of the statistical processing by SPSS software

The statistical reading of the data presented in the table above reveals the following:

We observe from the data presented in the table that a proportion of (52.5%) of the sample members agreed with the statement "I use artificial intelligence to summarize scientific references in research," which indicates that the student has indeed begun to adopt artificial intelligence as a kind of pedagogical support and instructional means throughout their university trajectory, particularly with respect to summarization; for, as in the case of this question, the scientific references specialized in a given course may be numerous and diverse, spanning books, articles, and dissertations, which

renders reading them in full arduous, prompting the student to resort to artificial intelligence to summarize them.

The sample members likewise agree with the statement "Artificial intelligence reduces the time spent writing university research papers" at a rate of (45.8%), while (33.3%) strongly agreed, which is consistent with what was mentioned previously: artificial intelligence possesses research, summarization, and formatting capabilities that render the student's writing of research papers a somewhat expedited process. Here, however, the issue of academic integrity, which the student must uphold in composing their research papers, invariably comes to the fore, along with the necessity of avoiding academic plagiarism through the amalgamation of AI-generated content with the work of specialists, or attributing it to oneself or to others.

As for the statement "Artificial intelligence assists in the analysis of statistical data for research," it was agreed upon by a proportion of (51.7%), meaning that artificial intelligence tools are capable of reading and analyzing statistical data in a scientifically sound manner, which accounts for their widespread adoption among the sample students.

We also observe that (63.3%) of the sample members agreed with the statement "I rely on artificial intelligence to improve the quality of my university research," which is explained by the fact that students resort to artificial intelligence in several aspects of scientific research with a view to improving its quality, such as reconstructing and reformulating ideas, in addition to formulating objectives, crystallizing problematics, and reading statistical data.

In the following statement, which reads "Artificial intelligence assists in the statistical analysis of university research," (45.8%) agreed and (21.7%) strongly agreed among the sample members, which is consistent with what was previously indicated namely, that artificial intelligence has the capacity for sound and precise scientific analysis of statistical data in research, the task remaining for the student being merely to interpret these analyses in accordance with the theories adopted in their research, the findings of previous studies, and their own study's hypotheses, if any.

A proportion of (45.8%) of the sample members agreed with the statement "Artificial intelligence supports collaboration in collective research projects," while (25.8%) remained neutral. Artificial intelligence can here unify the efforts of student research teams, such as by providing them with a shared work plan and consolidating their ideas and collective readings into unified conceptions that clarify their research vision for them; it can likewise furnish them with ideas, hypotheses, and perspectives on the research that they themselves had not noticed, as well as providing them with indicators particularly relevant here when considering the disciplinary diversity among researchers. With the emergence of what are known as startups within the university sphere, the research subject and its underlying idea may require research members from several disciplines such as the creation of a psychosocial counseling application, for instance, which requires the participation of computer science students and it is here that artificial intelligence plays a role in unifying students' efforts and visions despite disciplinary differences.

The considerable proportion of the research sample members who remained neutral may be attributable to their not having previously undertaken collective research projects, which necessarily precludes them from the experience of relying on artificial intelligence in such research.

We also observe that (53.3%) of the sample members agreed with the statement "Artificial intelligence assists in translating foreign scientific references," with a further (32.5%) strongly agreeing, which is explained by the fact that students rely fundamentally on artificial intelligence in translating foreign scientific research and references, given that artificial intelligence provides an enormous array of translation tools, such as DeepL Translator, QuillBot Translator, and the Claude model, among many others that provide robust translation preserving the original meaning of the research and ideas.

Regarding the statement "I prefer using artificial intelligence over traditional research methods," a proportion of (31.7%) of the sample members remained neutral, while (26.7% and 20.8%) were, respectively, between agreement and strong agreement, whereas (18.3%) opposed the idea of the statement. On this point, we find that the majority tends toward neutrality or rejection, which is a natural matter, as the researcher cannot dispense entirely with traditional research methods, given that artificial intelligence tools are but automated models that may not provide the researcher with the answers they are seeking as they would wish particularly when this coincides with weak student skills in using artificial intelligence, since arriving at good research results requires certain skills, most notably the skill of formulating the query submitted, known as the "prompt." All of this compels the student to resort to research by traditional means, from visiting the university library and browsing books and theses in print, to consulting scientific research and books published online and summarizing them manually.

Students' preference here for traditional methods does not fall outside the scope of either a personal a priori resistance to change, or a post-usage rejection stemming from lack of benefit, whether due to weak student skills in using artificial intelligence or technical deficiencies in the devices used and the quality of internet access available to them, which invariably compels them to resort to traditional research methods.

As for the following statement, "Artificial intelligence can replace traditional libraries in scientific research," it was opposed by a proportion of (30.8%) of the sample members, while (21.7%) remained neutral, which confirms what was previously discussed: that traditional research, which relies on printed scientific materials, cannot be entirely dispensed with in favor of artificial intelligence, given that the latter may be beset by technical malfunctions such as internet outages, source blocking, and restricted access thereto not to mention the possibility of their damage or deletion from databases at any time, whether intentionally or by error in addition to requiring certain usage skills not available to every researcher. University libraries, by contrast, house scientific references in printed copies, preserved in a carefully considered and secure manner that ensures their integrity for hundreds of years, made available to all researchers and interested parties, the student's sole responsibility here being to master scientific research skills in order to benefit from these references in their research. Traditional libraries have likewise benefited from technological advancement, which has assisted them in indexing and archiving their holdings, as well as in creating digital databases comprising digital copies of their printed references.

7.1.4. Presentation and Analysis of Data of the Fourth Axis: Artificial Intelligence and Its Role in Preparing for Examinations.

Table (05): Displays the data pertaining to the fourth dimension: AI and its role in preparing for examinations.

No	Item		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
20	Artificial intelligence reduces academic stress during examination preparation.	Frequency	22	53	23	16	6
		Percent	18,3%	44,2%	19,2%	13,3%	5,0%
21	Artificial intelligence saves and organizes my time in preparing for examinations.	Frequency	30	47	18	22	3
		Percent	25,0%	39,2%	15,0%	18,3%	2,5%
22	Artificial intelligence helps summarize lectures.	Frequency	51	59	5	3	2
		Percent	42,5%	49,2%	4,2%	2,5%	1,7%
23	Artificial intelligence provides useful practice questions that simulate examinations.	Frequency	31	54	24	9	2
		Percent	25,8%	45,0%	20,0%	7,5%	1,7%
24	I regularly rely on artificial intelligence in preparing for examinations.	Frequency	15	46	27	25	7
		Percent	12,5%	38,3%	22,5%	20,8%	5,8%
25	Thanks to artificial intelligence, my examination pass rate has increased.	Frequency	11	27	41	28	13
		Percent	9,2%	22,5%	34,2%	23,3%	10,8%
26	Artificial intelligence is an essential tool for the university student in examinations.	Frequency	17	32	39	22	10
		Percent	14,2%	26,7%	32,5%	18,3%	8,3%

Source: Outputs of the statistical processing by SPSS software

The statistical reading of the data presented in the table above reveals the following:

We observe from the data presented in the table that a proportion of (44.2%) of the sample members agreed with the statement "Artificial intelligence reduces academic stress during examination preparation," which indicates that the student, having used artificial intelligence, has become aware of the instructional models these tools contain, which facilitate their processes of review and summarization, as well as the possibility of generating mock examination models.

As for the statement "Artificial intelligence saves and organizes my time in preparing for examinations," it was agreed upon by (39.2%) and strongly agreed upon by (25.0%), meaning that artificial intelligence, in addition to summarizing and explaining lectures and providing innovative methods and techniques for review and preparation, accomplishes all of the aforementioned within a matter of minutes, thereby saving the student time.

A proportion of (49.2%) of the sample members agreed with the statement "Artificial intelligence helps summarize lectures," with strong agreement likewise found among (42.5%) of the sample members, which is consistent with what was previously mentioned regarding this aspect.

We also observe that (45.0% and 25.8%) of the sample members respectively agreed and strongly agreed with the statement "Artificial intelligence provides useful practice questions that simulate examinations." Artificial intelligence has gone beyond merely summarizing and explaining the content of the courses prescribed for the student, extending to the generation of practice questions for examinations, which serve to elevate the student's level, broaden the scope of their thinking and their capacity to comprehend questions, and likewise alleviate their pressure and stress, given that they have thereby acquired a clearer vision and expectation, even if only approximate, regarding the nature of the questions posed in the examination.

The following statement, which reads "I regularly rely on artificial intelligence in preparing for examinations," was agreed upon by (38.3%) of the sample members, with a further (12.5%) strongly agreeing, which confirms what was previously mentioned regarding the advantages artificial intelligence offers in the aspect of examination preparation, leading the student to rely on it automatically and on a regular basis in this regard.

Regarding the statement "Thanks to artificial intelligence, my examination pass rate has increased," a proportion of (34.2%) of the sample members remained neutral, while (23.3%) rejected it, which is explained by the fact that the student's reliance on artificial intelligence in summarizing and explaining their lessons, and resorting to it in preparing for examinations, contributed to raising their pass rates thereby confirming the importance and efficacy of these tools as instructional means that contribute, in one way or another, to achieving a positive shift in the academic achievement of the university student.

We also observe that (32.5%) of the sample members remained neutral toward the statement "Artificial intelligence is an essential tool for the university student in examinations," from which it may be understood that students do not regard artificial intelligence alone as sufficient for examination preparation, but rather consider it necessary to employ traditional methods of preparation, such as review and memorization, without disregarding the role of the instructor in explaining lessons and lectures and students' direct benefit therefrom.

7.1.5. Hypothesis Testing :

7.1.5.1. First Hypothesis :

- **There are no statistically significant differences regarding artificial intelligence and academic achievement and scientific research among university students at the significance level of 0.05 attributable to the gender variable.**

Table (06): Displays the data pertaining to: Descriptive Statistics for Groups

Group Statistics					
	Gender	N	Mean	Std. Deviation	Std. Error Mean
Artificial Intelligence and Academic Achievement / Scientific Research	Male	6	88,5000	10,50238	4,28758
	Female	114	88,5263	11,43989	1,07144

Source: Outputs of the statistical processing by SPSS software

From the statistical outputs presented above in the table, we find that the mean score for males (88.5000) approximates the mean score for females (88.5263), which indicates the absence of statistically significant differences between artificial intelligence and academic achievement and scientific research among university students according to the gender variable, a finding statistically supported by the significance value calculated in the following table.

Table (07): Displays data on: Independent samples t-test results testing the significance of differences for Hypothesis 1 by gender

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Dimensions of Artificial Intelligence and Academic Achievement / Scientific Research	Equal variances assumed	,117	,733	-,006	118	,996	-,02632	4,77566	-9,48342	9,43079
	Equal variances not assumed			-,006	5,643	,995	-,02632	4,41943	-11,00828	10,95565

Source: Outputs of the statistical processing by SPSS software

From the statistical outputs presented above in the table, we find that the calculated "t" value amounted to (-0.006) at 118 degrees of freedom, with a statistical significance level of Sig. = 0.996, a value greater than the probability significance threshold of $\alpha = 0.05$. Based on these statistical results, we acknowledge the absence of statistically significant differences between artificial intelligence and academic achievement and scientific research among university students according to the gender variable, whereby the null hypothesis is accepted.

This, if it indicates anything, indicates that artificial intelligence tools are available to all students alike, it being sufficient merely for them to acquire the skill of using them, as such tools do not require particular physical exertion or physiological characteristics that would create disparities between one gender and another. The sample students, regardless of gender, use artificial intelligence throughout their academic university trajectory, whether in scientific research and the production of research papers and projects, or in preparing for examinations and explaining and summarizing lessons.

Based on the foregoing, and in accordance with the functionalist perspective, artificial intelligence, as a structural technological tool within the university system, has afforded equal opportunities to males and females alike, which has led to the equalization of their research roles and the dissipation of the digital gender gap within the university thereby achieving a form of technical integration and equilibrium between male and female students, unifying and linking their functional behaviors in service of the higher system's objective, namely the production of knowledge.

In sum, our acceptance of the null hypothesis indicates the integration of artificial intelligence as a stable and neutral structural element within the university system, thereby contributing to the elimination of gender differentiation in research practices and to the achievement of a functional equilibrium that enables students, irrespective of gender, to perform their academic roles with equal efficiency thus preserving the stability and integration of the educational system within the university as a whole.

7.1.5.2. Second Hypothesis :

- **There are no statistically significant differences regarding artificial intelligence and academic achievement and scientific research among university students at the significance level of 0.05 attributable to the university level variable.**

Table (08): Displays the data pertaining to: Descriptive Statistics for Groups

Group Statistics					
	University Level	N	Mean	Std. Deviation	Std. Error Mean
Artificial Intelligence and Academic Achievement / Scientific Research	Licence	60	89,9833	11,28895	1,45740
	Master	60	87,0667	11,32399	1,46192

Source: Outputs of the statistical processing by SPSS software

From the statistical outputs presented above in the table, we find that the mean score for Bachelor's students is (89.9833), while the mean score for Master's students is (87.0667), which indicates an apparent difference between the two means, suggesting the possible existence of statistically significant differences between artificial intelligence and academic achievement and scientific research among university students according to the university level variable a matter requiring confirmation or refutation through the t-test, as illustrated in the following table.

Table (09): Displays data on: Independent samples t-test results testing the significance of differences for Hypothesis 2 by academic level

Independent Samples Test								
	Levene's Test for Equality of Variances		t-test for Equality of Means					
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error	95% Confidence Interval of the Difference

								Difference	Lower	Upper
Dimensions of Artificial Intelligence and Academic Achievement / Scientific Research	Equal variances assumed	,066	,798	1,413	118	,160	2,91667	2,06427	-1,17115	7,00449
	Equal variances not assumed			1,413	117,999	,160	2,91667	2,06427	-1,17115	7,00449

Source: Outputs of the statistical processing by SPSS software

From the statistical outputs presented above in the table, we find that the calculated "t" value amounted to (1.413) at 118 degrees of freedom, with a statistical significance level of Sig. = 0.160, a value greater than the probability significance threshold of $\alpha = 0.05$. Based on these statistical results, we acknowledge the absence of statistically significant differences between artificial intelligence and academic achievement and scientific research among university students according to the university level variable, whereby the null hypothesis is accepted.

The use of artificial intelligence was thus observed among all students regardless of their university level, given that the student, throughout the entirety of their academic trajectory, is required to complete research papers and projects and to attend lessons and lectures, on which they are subsequently examined in the form of semester examinations. Accordingly, research and academic achievement here are not confined to a particular university level, which renders the use of artificial intelligence a general practice among all students.

Through our adoption of the null hypothesis, it becomes apparent to us that artificial intelligence has generated a form of homogeneity in the mechanisms of academic achievement across all levels: the novice student at the Bachelor's stage and their more advanced counterpart at the Master's stage alike employ artificial intelligence tools to meet the requirements of their respective roles. We thus acknowledge that artificial intelligence has performed its function as a mechanism of equilibrium across all university levels within the university system, which likewise indicates the adaptation of students at all levels to the requirements of the digital age.

In sum, these results demonstrate that artificial intelligence has been transformed from an extraneous variable into a stable structural element within the higher education system, performing its assigned functional role of supporting the stability of the educational system and preserving its overall order, irrespective of the hierarchical gradation of university levels.

8. General Findings of the Study:

Based on the foregoing analysis of respondents' answers and the testing of hypotheses, we may derive the following set of general findings:

- Artificial intelligence has become an educational tool performing integrative functions within the university system, having contributed to improving students' cognitive capacities and enriching their scientific and cognitive fund through multiple educational, cognitive, and methodological

functions, such as simplifying knowledge and improving comprehension without overlooking its function in supporting cognitive and methodological formation through the enhancement of research skills, providing models and examples thereof. This role must, however, be noted as necessarily linked to conscious use, lest it be transformed from a functionally supportive tool into a factor weakening intellectual autonomy and critical capacity.

- Artificial intelligence has become a functional element within the university environment, improving the quality of research and raising the efficiency of students' research performance, adapting them to its requirements through its contribution to summarization, translation, data analysis, and time-saving.
- According to respondents' answers, artificial intelligence tools within the university system do not function as a complete substitute for traditional means, but rather as functionally complementary thereto, preserving equilibrium and effectiveness.
- Artificial intelligence performs a supportive function within the university system; it does not create a rupture with it, but rather reorganizes some of its functions in a manner serving integration, efficiency, and quality, by facilitating access to knowledge, unifying efforts in collective projects, and raising student productivity.
- Artificial intelligence has helped the student adapt to the functional requirements pertaining to academic achievement and examinations with greater efficiency, through summarizing lectures, organizing time, and providing practice questions simulating examinations, which raises the quality of preparation, enhances comprehension, and alleviates psychological pressure on the student.
- Artificial intelligence performs its function within the university system without generating functional differentiation linked to gender, by meeting the academic needs of all students alike and integrating with the requirements of their academic achievement.
- Artificial intelligence responds to the academic needs shared among all students regardless of their university level, such as needs related to learning, research, performance improvement, and effort organization; artificial intelligence thus performs a converging function within the university system across the various university levels.
- The results of the study reflect the functional role performed by artificial intelligence, through its contribution to achieving equilibrium and continuity in academic performance, without generating functional divergence or disparity between levels.

9. Conclusion:

In concluding this study, it becomes apparent that artificial intelligence is no longer merely an auxiliary technical tool, but has become an influential element within the university system, contributing to supporting academic achievement and invigorating scientific research among university students through several functions such as summarization, translation, analysis, and the facilitation of access to knowledge it being sufficient merely for the student to possess the skills of proper use. We thus arrive at the conclusion that artificial intelligence performs an integrative function within the university institution, serving its academic objectives and contributing to adapting the student to the requirements of research and academic achievement.

- 10. It is likewise worth noting the necessity of emphasizing that artificial intelligence does not eliminate the traditional roles of the instructor, the library, self-directed reading, and other traditional educational means, but rather complements them if employed judiciously in accordance with the established ethical and pedagogical standards which highlights our need to frame students' uses of it and to train them in accordance with what would improve such use.**

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