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The Impact of Artificial Intelligence Usage on Ethical Behaviour and Scientific Research: Does Gender Make a Difference?

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Abstract

Marked by rapid technological advances and gender diversity, universities are more than ever concerned about the state of the value system of the players involved in the educational and scientific research process. The risks to which AI exposes universities are diverse. Indeed, unhealthy use of AI runs the risk of turning ethics into an academic and scientific mirage. Based on a quantitative study of 239 academics from Tunisian universities in Tunis, Nabeul and Sousse, the key findings of SEM revealed that the use of artificial intelligence among male academics significantly and positively influences scientific research but significantly and negatively influences their ethical behaviour. The latter was found to significantly and negatively influences their scientific research. For female academics, the use of artificial intelligence significantly and positively influences both scientific research and ethical behaviour. The latter was found to significantly and positively influence scientific research. Unlike their male counterparts, female academics produce fewer scientific works. However, for them, ethics is of paramount importance and governs their scientific research practices. For women academics, ethics is not limited to a set of academic norms but symbolises a deeper reflection of the values that underpin their behaviour in scientific research. The results have implications for academics and decision-makers on the impact of ethics as a mediator between artificial intelligence usage and scientific research.

Keywords: Artificial intelligence (AI), ethical behaviour, gender, universities; scientific research.

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1. INTRODUCTION

"*How many articles do I have to produce to be promoted?*" A question that came to our ears, from a discussion between two colleagues that I inadvertently listened to while sipping my coffee and that caught my attention during a break in the cafeteria of our university. Such is the current debilitating and nebulous state of scientific research. At a time when artificial intelligence has succeeded in anchoring itself in our daily lives by having the impudence to simulate human cognitive processes to near perfection. The ethics of the researcher have become a rare commodity in a university context where competitiveness has become increasingly tough, where everything is now measured in terms of numerical value, which certainly enables everyone to achieve his/her objectives, but to the detriment of the intrinsic quality that enables scientific research to be raised to a high level of intellectual value.

In the educational sphere, ethics are supposed to be of paramount importance, both in terms of governing teaching practices and scientific research, quality and quantity, and in terms of providing food for thought about the value systems that underpin the behaviour and decisions of those who work in the academic world. The nobility of the teaching profession seems to dissipate if ethics disappear. How can recruitment panels distinguish between a Trojan horse application and one that is worthy of praise? In other words, how do they tell the difference between talent and impostors? Digging deeper, we are almost tempted to ask the following question: do the evaluation grids encourage the ostentatious display of articles at the top of scientific journal rankings to the detriment of the rewarding side of research and its genuine and effective contributions to all areas of society? This article does not pretend to answer these questions. However, we will make visible resistance and revolt where it might otherwise go unnoticed, to shake up the imposed order of things.

There is a premise that women and men have fundamentally distinctive personality traits [1]. As a result, women are better able to handle ethically difficult situations than their male counterparts. By transposing this idea in relation to the above-mentioned problem, the research question will take the following form. In terms of scientific research, are female academics more ethical than their male counterparts in their use of artificial intelligence? Following on from the above, this paper proposes to study the possible mediation effect of ethical behaviour, i.e. following research ethical guidelines, in the link between the use of artificial intelligence, i.e. their actual usage AI chatbots e.g. ChatGPT in research, by male and female academics and their scientific research, i.e. quantity and quality of their research practices.

2. THEORETICAL FRAMEWORK AND HYPOTHESES DEVELOPMENT

Several theories have attempted to validate the importance of using artificial intelligence, ethical behaviour and scientific research from a gender perspective. For example, March & Simon's behavioural theory [2], Festinger's social comparison theory [3], and Tajfel & Turner's social identity theory [4], have been at the forefront of establishing ways of thinking about and explaining these organisational realities.

2.1 The Debate Between Scientific Positivism and Sociological Idealism

Women have always faced two hostile camps on the issue of scientific positivism or nature versus sociological idealism or culture. In this respect, Baudoux [5], argues that "*essentialist postulates most often underpin their theoretical, methodological or interpretative scaffolding. Masculinity and femininity are seen in the background as givens of nature*" ([5]; p. 69). In contrast, Bourdieu [6], subtly demonstrates differences between males and female were historically and culturally constructed. Modern societies are divided into many hierarchical social groups. Gender plays an essential role. It affects individuals differently in terms of anatomical variances, gender roles, societal expectations, occupational models and social and legal norms [7].

Since time immemorial, the former have learned to shape different, indelible stereotypes for men and women, based on socially constructed identities. These implicit gendered understandings now govern the beliefs and behaviours of both sexes [8], and the assessments each sex makes of the other. For example, several research has showed that, unlike women, men tend to take more risks as long as they achieve their professional goals [9–11]. Recent research in Norway has revealed that the disproportion between women and men at the top of the university hierarchy is due to a lack of ambition on the part of women, who no longer have sufficient motivation to reach the top [12].

2.2 Artificial Intelligence and Ethical Behaviour

The scientific literature emphasises the beneficial effects of using AI in higher education while presenting its benefits for learning [13], deliberately or inadvertently ignoring its ethical or even critical issues [14, 15]. From its low-key beginnings in 1965, AI has undergone a meteoric rise. Today, we are talking about an AI monetisation that has irreversibly revolutionised the world we knew before. More and more people are working with AI and interacting with it [16]. AI refers to the capability of a robot to do cognitive functions that, until recently, were the prerogative of humans to perceive, develop, learn and solve problems [17].

Despite the many and varied advantages that access to AI brings to education, several challenges remain [18]. Some researchers, such as Bharadiya et al (2023) [19], are sceptical about the rapid incursion of AI into all fields and have several misgivings, seeing it more as a threat, while others, such as Southworth et al (2023) [20], believe that it is the major innovation of the century that will positively revolutionise higher education. In this research, we have chosen to focus on ethics. Of course, we encourage technological advances of all kinds, including AI, which is enjoying a resurgence of interest. However, we firmly believe that to guard against the unhealthy use of AI, the ethical component must be omnipresent. Undeniably, AI can positively help teacher-researchers in their theoretical and empirical investigations (problematic, research question, research objective, scientific article analysis, etc.), but it can also take over their tasks in their entirety. The output will certainly be commercial, stripped of meaning and significance. The risks to which AI exposes us are diverse. The worrying aspect seems to be mainly linked to the ethics of using AI, precisely in the case of excessively rapid growth, as some researchers have pointed out [21–24]. Thus, we can state our first hypothesis:

H1- Artificial intelligence usage has a positive impact on ethical behaviour

2.3 Ethical Behaviour and Scientific Research

Theft of ideas at conferences, manipulation of literature reviews, inappropriate control of research by funders, difficulties in assigning intellectual property, falsification, fabrication and plagiarism are all unethical behaviours, report De Vries et al (2006) [25], in a survey they carried out at three prestigious American universities on a sample of 51 scientists, mainly associate professors, assistant professors and postdoctoral fellows. And the list is certainly not exhaustive. Added to this is the other side of the coin of artificial intelligence and its tainted use, which is having harmful effects on scientific research [26]. Through such an ethical behaviour, academic institutions risk damaging their reputation, and teachers are the most at risk as they are confronted with the trend towards using artificial intelligence [27].

Regarding scientific research and the unethical behaviour of certain researchers, Chubin [28], states that "*allegations of cheating, dishonesty and misconduct have a considerable social impact while at the same time carrying a social stigma which it is feared will be retroactive*" (1985, p. 80). In this respect, he adds that the 'damaged goods' produced by a few will taint the goods produced by all. In so doing, he highlights an even more serious problem, namely the credibility of all scientific research, which is unfortunately becoming precarious. So, the second hypothesis takes the following form:

H2- Ethical behaviour has a positive impact on scientific research

2.4 Artificial Intelligence and Scientific Research

Artificial intelligence has invaded many sectors of activity, including scientific research [29]. Artificial intelligence in the service of humans can do all the work of research faster, more accurately and more efficiently. It provides researchers with exhaustive knowledge schemas. At the click of a button, it can perform surgical analyses and even write his paper if he so requests. The genius of AI lies in its ability to rapidly analyse large volumes of data and information with unprecedented precision. In the recent past, analysing scientific articles by hand was an arduous and tiring task, but now, thanks to AI, this tedious task has become a breeze. Through its algorithms, AI can comb through a colossal number of publications in record time, discerning those that are consistent with the problem proposed by the researcher and eliminating by default all those that are not, even proposing, where necessary, appropriate summaries for all the scientific articles selected.

This superhuman ability allows the researcher to benefit from an invaluable advantage, namely the time saved, which in turn allows him or her to publish more scientific articles more quickly. AI does not stop there. It can also reveal and identify theoretical and practical shortcomings in this pile of information, so that it can point the way for researchers towards previously unknown problems that could be genuine and highly advantageous in a specific field and for scientific research in general.

However, as AI becomes more and more embedded in research, the role of ethics becomes a parameter to be considered in the human/machine equation. This raises a question of its own: to what extent should we guard against this insertion of AI into scientific research, and where should we stop this technological haemorrhage to leave to humans what belongs to humans? Accordingly, the third and fourth hypotheses are as follows:

H3- Artificial intelligence is having a positive impact on scientific research

H4- Ethics mediate the relationship between the use of AI and scientific research

Based on the discussion above, the following conceptual model is suggested (see FIGURE 1).

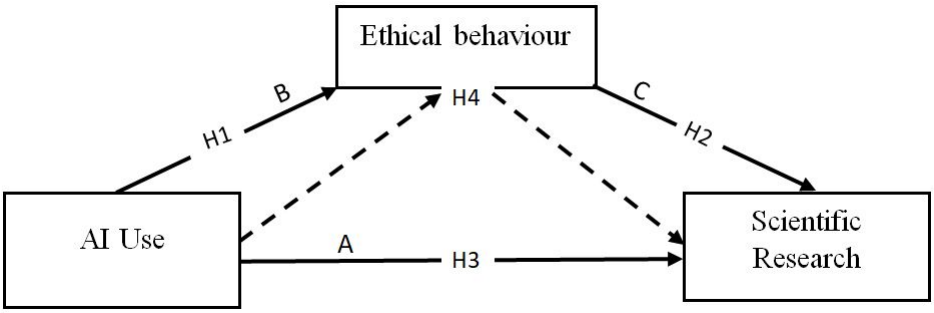

Figure 1: Conceptual Synthesis Model

3. METHODOLOGY

To validate the relevance of the variables solicited, we adopted quantitative approach throughout the empirical research using a questionnaire survey. The research approach including population, sample and measurement and data analysis will be discussed in the following section.

3.1 Sample and Procedures

The population, whose characteristics can be found in TABLE 1, corresponds to all teacher-researchers of all grades and sexes who are eligible to apply for any competition. We undertook a double analysis for the collected data. First, to verify the preconditions for conducting a factorial analysis, to describe the methodology adopted and to interpret the results obtained using SPSS 23.0 software. The main aim of this stage is to assess the dimensionality of the measurement scales, i.e. to determine if the items are grouped coherently around the planned theoretical dimensions, while validating their reliability and validity. This phase is important to confirm that the measurement tools used are appropriate for the study and capable of accurately reflecting the concepts they are intended to measure. Hence, principal components analysis (PCA) was adopted, supplemented by an internal consistency assessment. Second, a confirmatory analysis was carried out after the preliminary data analyses. The research model was evaluated using the structural equation modelling (SEM) technique, implemented by AMOS version 23 software. This analysis was carried out in two distinct phases, applying the suggestions of Hair et al. (2016) [30], to validate the dimensions identified during the exploratory assessment. Moreover, this stage examined causal relationships through structural equation models.

Table 1: Demographics of respondents

Criteria	Modalities	Frequency	Percentage
Gender	Women	120	50,21
	Men	119	49,79
Age	Between 24 and 34 years old	126	52,72
	Between 35 and 45 old	56	23,43
	Between 46 and 56 old	33	13,81
	57 and over	24	10,04
Categories	Doctors on contract	62	25,95
	Assistants	17	7,11
	Assistant professors	125	52,30
	Senior lecturers	35	14,64
Civil status	Single	82	34,31
	Married	125	52,30
	Divorced	32	13,39
Public universities (Faculties, schools, institutes)	Tunis	58	24,27
	Nabeul	102	42,68
	Sousse	79	33,05

3.2 Measurement Scales

Choosing measurement scales is a very important step. Hence, we were keen to adopt appropriate scale. To measure the use of artificial intelligence, we used the Venkatesh et al (2003) [31], three-item scale, which was used by Sobaih et al (2024) [32], and whose psychometric qualities are exceptional. For scientific research, we borrowed the Kassa & Worku (2025) scale [33], which basically contains 9 items. Finally, as regards ethical behaviour, we used the Johnson & Coyle scale (2012) [34], containing 10 basic items. One of them was in this form: 'I would take the same line if there were no rule against it'. In the meantime, some items were eliminated because they had poor factor contributions. We used a five-point Likert scale. All the factors in the research questionnaire were proportioned in relation to this scale. Participants indicated their choices by ticking the most suitable answer for them, ranging from 'strongly disagree', 'disagree', 'indifferent', 'agree', to 'strongly agree'.

3.3 Measurement Results

TABLE 2 show the results of descriptive results as the means varies between 2.76 to 4.12, with SD between 0.972 to 1.342. The results showed that the collected responses are not compressed around the mean [35]. Regarding the first-order model, we found that the x2/ddl ratio is equal to '2.863', i.e. less than 3. The other indices that indicate model fit remains good as follow: SRMR = 0.0516, RMSEA = 0.080, CFI = 0.972, TLI = 0.977, IFI = 0.981, and NFI = 0.972. Additionally, the results of Skewness and Kurtosis (TABLE 2, confirm that the data is distributed normally [36].

Table 2: Descriptive statistics

Abr.	Item	SL	Min	Max	M	SD	Ske	Kur
Artificial intelligence use								
AU1	**"**I intend to use the knowledge and skills acquired through ChatGPT in my research activities**"**	.73	1.0	5.0	3.63	1.203	−1.142	1.298
AU2	**"**The knowledge and skills I've acquired through ChatGPT will be useful for my professional career**"**	.77	1.0	5.0	3.42	**.972**	−.183	.357
AU3	**"**Using ChatGPT has enabled me to improve my results in terms of scientific research**"**	.76	1.0	5.0	**4.12**	1.121	−.406	−.296
Scientific research								
SP4	**"**I do a lot of work every day**"**	.73	1.0	5.0	**2.76**	1.127	−.125	.073
SP5	**"**I get things done quickly and efficiently**"**	.70	1.0	5.0	3.42	1.084	−.734	−.032
SP6	**"**I have a high level of task completion**"**	.71	1.0	5.0	3.12	1.149	−.369	−.763
SP7	**"**The results of my work are of the highest quality**"**	.75	1.0	5.0	3.69	1.284	−.330	−.674
SP8	**"**I've improved my knowledge and skills**"**	.77	1.0	5.0	3.25	**1.342**	−.342	−.489
Ethical behaviour								
EI9	**"**I would take the same line**"**	.82	1.0	5.0	3.11	1.221	−.257	−.872
EI10	**"**I would take the same line if there were no rule against it**"**	.81	1.0	5.0	3.01	1.339	−.182	−1.183
EI11	**"**I would take the same line if no one was harmed in the process**"**	.79	1.0	5.0	3.37	1.312	−.457	−.572
EI12	**"**I would take the same line because there's nothing wrong with doing so**"**	.72	1.0	5.0	3.17	1.328	−.523	−1.220
EI13	**"**I would take the same line because everyone else is doing it**"**	.71	1.0	5.0	3.09	1.109	−.609	−.560
EI14	**"**I would take the same line because nobody cares**"**	.74	1.0	5.0	3.36	1.129	−.048	−.529
EI15	**"**I would adopt the same course of action because of the benefits it brings me**"**	.72	1.0	5.0	3.83	1.155	−.174	−.662

"Model fit: (χ^2 (88, N = 239) = 251.925 p < 0.001, normed χ^2 = 2.863, RMSEA = 0.080, SRMR = 0.0516, CFI = 0.972, TLI = 0.977, IFI= 0.981, NFI = 0.972, *** p < 0.001". "Note: Min = minimum, Max = maximum, M = mean, SD = standard deviation, skewness = symmetry coefficients, kurtosis = flattening coefficient", Ske = Skewness, Kur = Kurtosis". Scoring high in ethical behaviour means adopting unethical behaviour.

To check whether the variable items, which are accepted to assess the similar phenomenon, are associated, convergent validity through the CR was checked. The results show convergent validity was proven for all constructs [37]. Furthermore, we had to verify if the square root of the AVE of every construct is truly larger than the associations it has with the other constructs. TABLE 3

shows that discriminant validity was proven for all constructs [38]. Furthermore, AVE value for the use of artificial intelligence (0.568), ethical behaviour (0.577) and scientific research (0.519). They all were above MSV, that has values of 0.052, 0.108, 0.108 correspondingly. The results confirm discriminant validity [30]. In addition, the intercorrelation results were higher than the values on the diagonal indicating the square roots of the factor-specific AVEs (TABLE 3, in bold).

Table 3: Convergent and discriminant validity

Factors and items	SL	CR	AVE	MSV	ASV	1	2	3
1- AI Use, *(α = 0.901)*		0.798	0.568	0.052	0.039	**.754**		
AU1	.73							
AU2	.77							
AU3	.76							
2- Scientific Research, *(α = 0.932)*		0.843	0.519	0.108	0.067	.163**	**.720**	
SP4	.73							
SP5	.70							
SP6	.71							
SP7	.75							
SP4	.77							
3- *Ethical behaviour*, *(α = 0.958)*		0.905	0.577	0.108	0.080	.228**	.329**	**.760**
EI9	.82							
EI10	.81							
EI11	.79							
EI12	.72							
EI13	.71							
EI14	.74							
EI15	.72							

"Model fit: (χ^2 (195, N = 239) = 350 p < 0.001, normed χ^2 = 1.795, RMSEA = 0.052, SRMR = 0.0426, CFI = 0.978, TLI = 0.982, NFI = 0.987, IFI= 0.985, *** p < 0.001". "Note: CR = Composite Reliability, VE = Average Variance Extracted, MSV = Maximum Shared Value, MSV = Average Shared Value"

4. STRUCTURAL EQUATION MODELLING RESULTS AND DISCUSSION

In this section we will carry out structural equation modelling to verify the effect of artificial intelligence usage on scientific research through the adoption of ethical behaviour. TABLE 4 presents a Chi-square related to its degree of freedom x^2/ddl (1.795), which is below 3. Moreover, the RMSEA index is 0.052, near zero confirming that the fit is adequate [39]. The values of IFI=0.985, NFI = 0.987, TLI = 0.982 and CFI = 0.978 confirm a very good fit. The standardised

RMR, SRMR equal to 0.0427, was excellent, being near zero. The hypotheses were examined and showed significant associations (see TABLE 4, FIGURE 2 and FIGURE 3).

Table 4: The results of the structural model

Assumptions	β	T value	P	R^2	Results
H1: AIU → EB Men	−.569	−4.658	***		Not supported
H1: AIU → EB Women	.810	9.375	***		Supported
H2: EB → SR Men	−.679	−4.061	***		Not supported
H2: EB → SR Women	.210	3.125	***		Supported
H3: AIU → SR Men	.687	4.102	***		Supported
H3: AIU → SR Women	.159	2.011	***		**Supported**
AIU → EB Men → SR				.662	
AIU → EB Women → SR				.731	

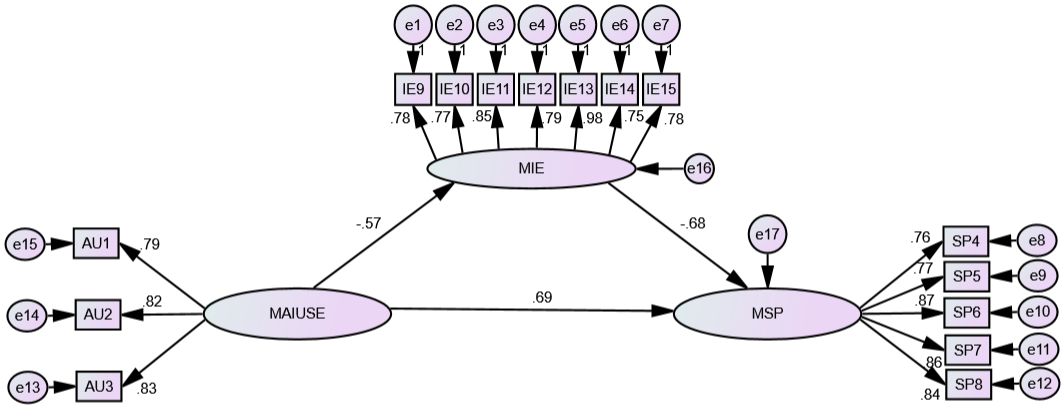

Figure 2: The structural model for male academics

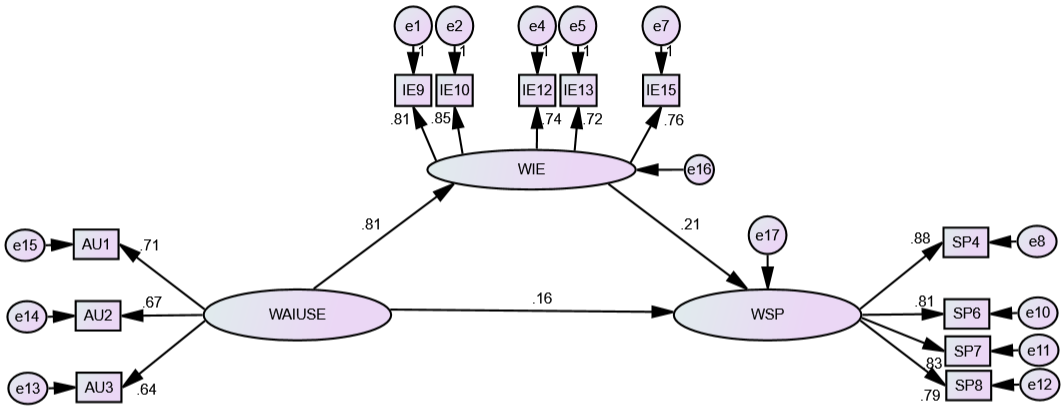

Figure 3: The structural model of women academics

For male academics the use of artificial intelligence significantly and positively influences scientific research ($\beta = 0.687$, $p < 0.001$) and significantly negatively influences ethical behaviour ($\beta = -0.569$, $p < 0.001$), which significantly and negatively influences scientific research ($\beta = -0.679$, $p < 0.001$). Furthermore, the robustness of the model is defended by the significant and strong coefficient displaying a value of ($R^2 = 0.662$), (TABLE 4) representing the proportion of scientific research explained by artificial intelligence usage by male academics and their ethical behaviours in the regression model. From this, we conclude that artificial intelligence usage and ethical behaviour, which explain about 67% of the variance in scientific research of male academics.

While for female academics the use of artificial intelligence significantly and positively influences scientific research ($\beta = 0.159$, $p < 0.001$) and significantly and positively influences ethical behaviour ($\beta = 0.810$, $p < 0.001$), that significantly and positively influences scientific research ($\beta = 0.210$, $p < 0.001$). Furthermore, the robustness of the model is defended by the significant and strong amount displaying a value of ($R^2 = 0.731$), (TABLE 4) demonstrating the proportion of scientific research explained by female academics' use of artificial intelligence and their ethical behaviours in the regression model. From this, we can conclude that artificial intelligence usage and ethical behaviour, we can explain about 73% of the variance in the scientific research of female academics.

To examine the mediation influence of ethical behaviour on the link between artificial intelligence usage and scientific research, we used the method of Baron and Kenny (1986) [40], including four stages. Stage 1, we need to prove that the relationship between artificial intelligence usage and scientific research is significant, for both male and female academics, to confirm that there is an influence to be publicised. Certainly, artificial intelligence significantly influence effect on scientific research for men and women respectively ($\beta = 0.687$, $p < 0.001$; $\beta = 0.159$, $p < 0.001$). In the regression of scientific research on artificial intelligence, the coefficient is significant (with two Student tests displaying the following values respectively 4.102 = 1.96; p = 0.001 - 2.011 = 1.96; p = 0.001).

Second, we need to justify that the use of artificial intelligence significantly influences on the mediator, i.e. ethical behaviour, which is then considered as an exogenous variable in a regression analysis of ethical behaviour on the use of artificial intelligence. Indeed, artificial intelligence has a significant effect on ethical behaviour for both male and female academics ($\beta = -0.569$, $p < 0.001$; $\beta = 0.810$, $p < 0.001$).

Third, we need to prove that the relationship between the mediator or ethical behaviour and scientific research is significant. Ethical behaviour significantly influences on scientific research for both male and female academics ($\beta = -0.679$, $p < 0.001$; $\beta = 0.210$, $p < 0.001$). Here, we also regress scientific research on both ethical behaviour and artificial intelligence usage. Controlling for the latter, the coefficient between ethical behaviour and scientific research should stay significant and it is.

Fourth, we checked the nature of ethical behaviour by investigative the significance of the indirect link between artificial intelligence usage and scientific research. Indeed, as mentioned in TABLE 5, for both male and female academics, artificial intelligence always impacts scientific research through ethical behaviour ($\beta = 0.262$, with $p = 0.03 < 0.05$; $\beta = 0.378$, with $p = 0.04 < 0.05$), so both relationships always remain significant even after including ethical behaviour as a mediating variable. That said, we can conclude that ethical behaviour plays a partial mediating role for male

and female academics (see TABLE 5). Having said that, reading the results reveals that, unlike their male counterparts, female academics in Tunisia certainly have fewer scientific publications. However, for them, ethics are of crucial importance and govern their scientific research practices. For female academics, ethics is not just a set of rules but embodies a deeper reflection on the values that underpin their behaviour.

Far be it from us to claim that the results we have achieved can be generalised, but it is indicative of the degree of maturity and responsibility that female academics have attained in comparison with their male counterparts.

Table 5: The type of mediation for male and female academics

Parameter	**Estimate**	**Lower**	**Upper**	**P**	Mediation
H4 - AIU → EB Men → SR	**0.262**	0.103	0.488	**0.03**	$0.03 < 0.05$ Partial mediation
H4- AIU → EB Women → SR	**0.378**	0.122	0.676	**0.04**	$0.04 < 0.05$ Partial mediation

5. IMPLICATIONS OF THE STUDY

In the light of our results, it is true that the mediation influence of ethical behaviour on the link between artificial intelligence usage and scientific research is only partial for both male and female academics. However, unlike their female counterparts, the more male academics use artificial intelligence, the more unethical their behaviour becomes obvious. An alarming result that needs to be understood in depth. To do this, we suspect a psychosociological element and another contingency that discreetly favour the state of this result. On the psychosociological side, for instance, research has confirmed that unlike women, men tend to take more risks as long as they achieve their professional goals [9–11]. In this respect, Zahid, et al, (2025) [1], attest that women and men have fundamentally distinct psychological traits.

This difference in traits means that female academics are more attentive to their behaviour than male colleagues [41]. As for contingent considerations, the university configuration itself is problematic. National competitive examinations, university accreditation and the distinction between A and B corps may be the hidden causes of the problems of deliberate withdrawals. At this point, we should ask ourselves the following question: how many assistant professors have thrown in the towel, contenting themselves with their tenure and their teaching hours. Drawing a line under scientific research and the possibilities of promotion which become like a mirage that gets further and further away as one tries to reach it. For them, scientific research means back-breaking work with no real income at the end. ‘After all, I’m a woman and a master’s degree in assistantship is already an achievement’, retorts and/or thinks the woman who chose to withdraw as a consolation.

Artificial intelligence technologies are here to stay, and no one can paralyse their development [42, 43]. Their use can be highly advantageous for some, but they can also have a negative impact on the reputation of those who use them unless they are adopted judiciously and prudently. The application of ethical governance implies highlighting the regulation of ethical behaviour through

the introduction of a panoply of whistleblowing mechanisms to prevent and counteract any deviant behaviour that could have harmful repercussions on scientific research.

It is the duty of decision-makers to change university regulations regarding the adoption of ethical behaviour by academics. We should make ethical behaviour a habit, not a duty. In the belief that they are closing the gap, university regulations and their many and varied standards and provisions governing the application of ethics and academic integrity are only making the situation worse. The problem is that ethics was not established with a view to enabling academics to become effectively virtuous persons, in other words endowed with an ethos.

Nevertheless, it has been enthroned or even parachuted in without academics acquiescing to the procedures of their introduction. Worse still, in the absence of compliance, swift disciplinary action is taken to punish those who have broken the rule and to make an example of them to subdue the most recalcitrant. Universities stubbornly insist on applying ethics rather than socialising or even teaching them. By failing to react in time to rectify the situation and propose effective solutions, will they end up opening Pandora's box?

6. CONCLUSION

This paper is one of the first attempts to measure ethical behaviour and its potential mediation between artificial intelligence usage and scientific research from a gender perspective. The key findings confirmed that, for male academics, the use of artificial intelligence significantly and positively affect scientific research and significantly and negatively affect ethical behaviour. The latter significantly and negatively affect scientific research. Whereas for female academics, the use of artificial intelligence was found to significantly and positively affect both scientific research and ethical behaviour. The latter significantly and positively affect scientific research.

Unlike their female counterparts, the more male academics use artificial intelligence, the more unethical their behaviour becomes more obvious. Despite female academics were found to produce fewer scientific works, ethics is of very important for them and governs their scientific research practices. This could be because ethics is not limited to a set of academic norms but symbolises a deeper reflection of the values that underpin their behaviour in scientific research. The research has expanded the literature on the ethical behaviour of male and female academics, particularly in relation to artificial intelligence technologies. Understanding this role would enable researchers and policymakers to recognise the importance of psychosocial factors in motivating academics to carry out scientific research.

Like many studies in social sciences, this research has some limitations that open avenues for future work. Firstly, the sample size (N = 239) remains relatively modest, which may limit its generalisability. A larger sample would provide more representative data. A qualitative study could be carried out to investigate and identify the psychosocial or contextual obstacles to the use of artificial intelligence by female academics. Such an approach would make it possible to devise effective strategies for promoting scientific research in our universities.

Author Contributions:

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References

[1] Zahid RM, Maqsood US, Irshad S, Khan MK. The role of women on board in combatting greenwashing: A new perspective on environmental performance. Bus Ethics Environ Respons. 2025;34:121-136.

[2] March JG, Simon HA. Organizations. Wiley. 1958.

[3] Festinger L. A theory of social comparison Processes. Hum Relat. 1954;7:117-140.

[4] Tajfel H, Turner JC. The social identity theory of intergroup behavior. In: Worchel S, Austin WG, editors. The psychology of intergroup relations. Nelson-Hall. 1986:7-24.

[5] Baudoux C. Le leadership féminin en gestion de l'éducation. In: Corriveau L, editor. Le leadership en éducation: De multiples regards, une même passion. Éditions La Chenelière/McGraw Hill. 2002:49–74.

[6] Bourdieu P. La domination masculine. 57 rue Gaston-Tessier: Editions Points, Paris XIX. 1998.

[7] Gartzia L. Editorial: Research directions on gender and workplace health. Int J Workplace Health Manag. 2025;18:1-4.

[8] Bareket O, Fiske ST. Lost opportunities: how gendered arrangements harm men. Proc Natl Acad Sci. 2025;122(5):e2320788122.

[9] Byrnes JP, Miller DC, Schafer WD. Gender differences in risk-taking: A meta-analysis. Psychol Bull. 1999;125:367-83.

[10] Brody LR, Hall JA. Gender, emotion, and expression. In: Lewis M, Haviland-Jones JM, editors. Handbook of emotions: Part IV: Social/personality issues. New York: Guilford Press. 2nd ed. 2000:325– 414.

[11] Urmila MS, Pillai R, Mukesh HV, Prabhu N. Are employer-initiated financial education programs effective for women? Insights for organizational training programs through stakeholder perceptions. Ind Comm Train. 2025;57:195-214.

[12] Drake I, Svenkerud SW. Career ambitions of women academics. Are women willing and able to rise to the top in higher education institutions? Stud Higher Educ. 2024;49:1640-1651.

[13] Collin S, Marceau E. Enjeux éthiques et critiques de l'intelligence artificielle en enseignement supérieur. Éthique publique. 2022;24.

[14] Zawacki-Richter O, Marín VI, Bond M, Gouverneur F. Systematic review of research on artificial intelligence applications in higher education–where are the educators? Int J Educ Technol Higher Educ. 2019;16:1-27.

[15] Krutka DG, Smits RM, Willhelm TA. Don't Be Evil: Should We Use Google in Schools? TechTrends. 2021;65:421-431.

[16] Hao X, Demir E, Eyers D. Critical success and failure factors in the AI lifecycle: a knowledge graph-based ontological study. J Modell Manag. 2025.

[17] Duan Y, Edwards JS, Dwivedi YK. Artificial intelligence for decision making in the era of Big Data-evolution, challenges and research agenda. Int J Inf Manag. 2019;48:63-71.

[18] Mulyani H, Istiaq MA, Shauki ER, Kurniati F, Arlinda H. Transforming education: exploring the influence of generative AI on teaching performance. Cogent Educ. 2025;12:2448066.

[19] Bharadiya JP, Thomas RK, Ahmed F. Rise of artificial intelligence in business and industry. J Eng Res Rep. 2023;25:85-103.

[20] Southworth J, Migliaccio K, Glover J, Reed D, McCarty C, et al. Developing a model for AI across the curriculum: transforming the higher education landscape via innovation in AI literacy. Computers and Education. Artif Intell. 2023;4:100127.

[21] Hasanein AM, Sobaih AE. Drivers and consequences of ChatGPT use in higher education: key stakeholder perspectives. Eur J Investig Health Psychol Educ. 2023;13:2599-2614.

[22] Hasanein, A., Sobaih, A., & Elshaer, I. (2024). Examining Google Gemini's acceptance and usage in higher education. Journal of Applied Learning and Teaching, 7(2). https://doi.org/10.37074/jalt.2024.7.2.5.

[23] Sobaih AE. Ethical concerns for using artificial intelligence chatbots in research and publication: evidences from Saudi Arabia. J Appl Learn Teach. 2024;7(1):93-103.

[24] Namoun A, Alrehaili A, Nisa ZU, Almoamari H, Tufail A. Predicting the usability of mobile applications using AI tools: the rise of large user interface models, opportunities, and challenges. Procedia Comput Sci. 2024;238:671-682.

[25] De Vries R, Anderson MS, Martinson BC. Normal misbehavior: scientists talk about the ethics of research. J Empir Res Hum Res Ethics. 2006;1:43-50.

[26] Qanita Putri Muslik S, Mulia Wibawa B, Windharto A. The darkside of artificial intelligence to consumer behavior: bibliometric review. J Acc Fin Manag. 2025;5:1579-1591.

[27] Singh JP, Mishra N, Mishra KK. Promoting Academic Integrity: Strategies and Challenges in Higher Education. In S. Saeed, O. Rana, & R. Dhanaraj (Eds.), Higher Education and Quality Assurance Practices. IGI Global Scientific Publishing. 2025;191-224.

[28] Chubin DE. Research malpractice. BioScience. 1985;35:80-89.

[29] Limongi R. The use of artificial intelligence in scientific research with integrity and ethics. Future Stud Res J Trends Strateg. 2024;16:e845.

[30] Hair JF, Black WC, Babin BJ, Anderson RE. Multivariate data analysis. 7th ed. Upper Saddle River (NJ): Prentice Hall; 2010.

[31] Venkatesh V, Morris MG, Davis GB, Davis FD. User acceptance of information technology: toward a unified view. MIS Q. 2003;27:425-478.

[32] Sobaih AE, Elshaer IA, Hasanein AM. Examining students' acceptance and use of ChatGPT in Saudi Arabian higher education. Eur J Investig Health Psychol Educ. 2024;14:709-721.

[33] Kassa BY, Worku EK. The impact of artificial intelligence on organizational performance: the mediating role of employee productivity. J Open Innov Technol Mark Complexity. 2025;11:100474.

[34] Johnson J, Coyle T. Vers la compréhension de la décision éthique: une mesure redéfinie de l'intention d'agir de façon éthique. Vie & sciences de l'entreprise. 2012;191192:165-191.

[35] Bryman A, Cramer D. Quantitative data analysis with IBM SPSS 17. In: A guide for social scientists. Vols. 18 & 19. Routledge. 2012.

[36] Kline RB. Principles and practice of structural equation modeling. New York: Guilford Publications. 2015.

[37] Jöreskog KG. Analysis of Covariance Structures. In: Nesselroade JR, Cattell RB, (eds). Handbook of Multivariate Experimental Psychology. Perspectives on Individual Differences. Springer. 1988;207–230.

[38] Fornell C, Larcker DF. Evaluating structural equation models with unobservable variables and measurement error. J Mark Res. 1981;18:39-50.

[39] Didellon L, Valette-Florence P. L'utilisation des indices d'ajustement dans les modèles d'équations structurelles: présentation et recommandations d'usage. In Journées Nationales des IAE. 1996.

[40] Baron RM, Kenny DA. The moderator–mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations. J Pers Soc Psychol. 1986;51:1173-82.

[41] Sobaih AEE, Elshaer IA. Structural equation modeling-based multi-group analysis: examining the role of gender in the link between entrepreneurship orientation and entrepreneurial intention. Mathematics. 2022;10:3719.

[42] Sobaih A, Abuelnasr A. Battle of AI chatbots: graduate students' perceptions of ChatGPT versus Gemini for learning purposes in Egyptian higher education. J Appl Learn Teach. 2025;8:128-42.

[43] Elshaer IA, Hasanein AM, Sobaih AEE. The moderating effects of gender and study discipline in the relationship between university students' acceptance and use of ChatGPT. Eur J Investig Health Psychol Educ. 2024;14:1981–1995.