

## Academic Plagiarism in the Artificial Intelligence Era: The Practices of University Students in Iraq

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**Abstract:** In the era of artificial intelligence, concerns about academic plagiarism are on the rise in higher education. This study aimed to identify the key components of academic plagiarism and validate a developed questionnaire addressing its prevalence, common practices, and differences based on gender and discipline. A convenience sample of 496 students from humanities and sciences at various universities in Iraq participated. The questionnaire demonstrated good construct validity and reliability, identifying three key components of plagiarism. Results indicated a moderate inclination towards plagiarism, with ghost-writing as the most common practice, followed by inappropriate referencing. Egregious forms of plagiarism were less frequent. While no significant gender differences were observed, science students  $M=12.03$  compared to humanities students  $M=11.71$  exhibited a higher tendency for egregious plagiarism ( $p<0.04$ ). These findings highlight the need for targeted interventions to address plagiarism and uphold ethical standards in higher education, particularly in regions with limited research on this issue.

**Keywords:** Artificial Intelligence, Academic Integrity, Academic Plagiarism, Egregious Plagiarism, Inappropriate Referencing, Ghost-Writing.

### 1. Introduction

Academic plagiarism is defined as using someone else's words or ideas without giving them credit (Heckler & Forde, 2015). This kind of misconduct at universities is a global problem that negatively impacts both students and educational institutions (Baran & Jonason, 2020; Curtis & Vardanega, 2016). Studies indicate widespread student plagiarism across Asian and European countries. (Peytcheva-Forsyth, Mellar, & Aleksieva, 2019; Pupovac, Bilić-Zule, & Petrovečki, 2008; Tatum & Schwartz, 2017; Ives et al., 2017; Brown, Weible, & Olmosk, 2010; Ma, McCabe, & Liu, 2013; Akçapınar, 2015), and unfortunately, it is still one of the most detrimental student practices (Chang et al., 2015; Drisko, 2022).

The proliferation of the Internet and rapid technological advancements enables students to access, store, and manipulate vast amounts of information (Smith et al., 2023; Olivia-Dumitrina, Casanovas, & Capdevila, 2019; Sohrabi, Gholipour, & Mohammadesmaeili, 2011).

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ChatGPT and other AI platforms raise new challenges regarding academic integrity and plagiarism (Cotton, Cotton, & Shipway, 2023), in their study Bin-Nashwan, Sadallah, and Bouteraa (2023) expressed their concerns about the issue of academic honesty due to the recent utilization of ChatGPT by academics, and students to accomplish diverse academic assignments, generating ideas, summarizing literature, and composing essays. Additionally, the use of homework helps websites to obtain solutions by the students (Emerson & Smith, 2022). Researchers believed that the pressure placed on students to write research projects drive them to seek material on the Internet, which influences the incidence of plagiarism (Allen, Lourenco, & Roberts, 2016). Likewise, other studies discovered that students' excuses for academic dishonesty were academic workload, their poor English language skills, and pressure to get a high mark (Costley, 2019; Kadayam et al., 2023; Rahimi, Jones, & Bailey, 2024).

Plagiarism can appear in a variety of forms (Beute, Van, & Winberg, 2008), and assignments that have been ghost-written and submitted as the author's original work are just one example of how plagiarism manifests itself (Curtis & Vardanega, 2016). Lines (2016) claims that academics often approve ghost-written assignments because they believe the work was completed by students. According to Peytcheva-Forsyth, Mellar, and Aleksieva (2019) contract cheating may now be more of a concern than plagiarism. In light of the availability of ghost-writing services, for evaluations academics and institutions worldwide have had to come up with strategies to combat plagiarism (Hill, Mason, & Dunn, 2021).

Academic misconduct carries significant repercussions for individuals, societal principles, and the economy (Błachnio et al. 2022). It is not merely a matter of immediate academic consequences; previous studies have connected it to unethical employment practices (Mulisa & Ebessa, 2021; Parks et al., 2018; Nonis & Swift, 2001). AlDahdouh (2021) concluded that plagiarism, whether it is traditional or cyber is a question of personal belief. Students' main justification for academic plagiarism was found to be the absence of harsh penalties (Dejene, 2021). The responses of faculty members to students engaging in academic dishonesty differ (Mahmud, Bretag, & Foltýnek, 2019). According to Chirikov, Shmeleva, and Loyalka (2020) there is not much compelling evidence that faculty interventions may stop academic misconduct.

Furthermore, cultural differences influence how academics and students in different nations view and justify academic misconduct (Parks et al., 2018; Beute, Van Aswegen, & Winberg, 2008; Shang, 2019). For instance, researchers discovered that plagiarism was now institutionally tolerated in Iran, where two-thirds of students admitted to cheating in a semi-structured interview (Sohrab, Gholipour, & Mohammadesmaeili, 2011). According to Aljurf, Kemp, and Williams (2020), Arab students held the belief that their academic dishonesty was driven by several factors such as shame avoidance, patriarchal pressure, peer pressure, and mind-set. A study conducted in Jordan showed how social norms, opportunities, pressures, reasoning, and social trust affect students' academic dishonesty behavior (Shbail et al. 2022). Unfortunately, there are concerning high rates of data falsification and fabrication among researchers and academics (Allen, Lourenco, & Roberts, 2016; LaFollette, 1992). Students are encouraged to engage in academic dishonesty if a lecturer tolerates such behavior (Ibrahim et al., 2013), therefore, instructing students to avoid plagiarism necessitates constant effort at all levels and clear directions (Drisko, 2022).

It is quite obvious that students are now more likely to commit academic plagiarism as a result of the exponential development of the Internet, but it has also provided new enforcement tools necessary to prevent this misconduct (Curtis & Vardanega, 2016). Chirikov, Shmeleva, & Loyalka (2020) emphasized how critical it is to support faculty members in encouraging students to be honest in their academic work. Primarily fostering academic integrity is essential to the success of higher education (Peytcheva-Forsyth, Mellar, & Aleksieva, 2019). According to several studies, the vast majority of students are uninformed of what plagiarism is and how to recognize it (Fenster, 2016; Haitch, 2016; Dawson & Overfield, 2006). In Waltzer and Dahl's (2021) study, most students were asked if they thought copying was wrong and what exactly constituted plagiarism; nonetheless, most did not believe their activities were ethical. This means students are more inclined to cheat if they do not consider certain types of cheating unethical (Elias & Farag, 2010).

For further illustration, the natural sciences, engineering, and human sciences all have different levels of plagiarism, according to prior studies. For instance, Hu and Lei (2015) found a clear discipline-based difference in participants' knowledge of plagiarism and perceptions about its causes. While it was found by Eshet (2023) the switch to emergency remote teaching was linked to decreased academic integrity, particularly in human science fields. In contrast, Ledwith, Risquez, and O'Dwyer (2010), found engineering students exhibited a higher likelihood of engaging in plagiarism compared to their peers in business studies, and male students were more likely to plagiarize than females. Likewise, male participants in the study by Hensley, Kirkpatrick, and Burgoon (2013) reported higher rates of plagiarism and fabrication of justifications than female students. Ip et al. (2018), however, observed no differences in the participation in various forms of academic plagiarism between male and female students.

Although no clear association exists between plagiarism awareness and actual conduct among students (Shang, 2019), more research is needed, according to Kocdar et al. (2018) to understand how students perceive academic dishonesty such as plagiarism and exam cheating. Interestingly, thorough research on academic dishonesty among Iraqi university students is lacking. In order to answer the following research questions, the main objective of the current study is to identify the key components of academic plagiarism as well as the internal structure of the developed questionnaire. The following section will address the research questions outlined at the end of the introduction.

### **1.1 Research questions**

1. What is the prevalence of practicing academic plagiarism among university students?
2. What are the most common plagiarism practices among university students?
3. Are there any significant differences in gender, and discipline-based (humanities, and sciences) in practicing academic plagiarism?

## **2. Methods**

### **2.1 Participants and procedure**

The study participants are university students who were selected using convenience sampling and they consisted of 496 students from different universities in the Kurdistan region of Iraq. The information

gathered from the selected sample was utilized to look at how respondents reported their practices of academic plagiarism. The participants were chosen from two fields (Humanities and Sciences) from various faculties of universities in Iraq. Students studying science 267 and humanities 229 accounted for 45.2% and 53.8% of the total; while male students 161 and female students 335 made up 32.5% and 67.5% of the sample as showed in Table 1.

Table 1: Participants' Demography

Variables	Characteristics	Frequency	%
Gender	Male	161	32.5
	Female	335	67.5
Discipline	Sciences	267	53.8
	Humanities	229	46.2

## 2.2 Research instrument

The questionnaire, developed in Kurdish language based on the established literature by adapting items from Chang et al. (2015); Yazici et al. (2023); Măță, Lazăr, & Ghiațău (2020). The selected items to be part of the questionnaire were modified and other items have been added according to a panel of experts' recommendation that contently validated the questionnaire to be relevant for assessing factors related to practicing academic plagiarism. The questionnaire resulted in 31 items, and it was consisting of two parts, the demographic information and the questionnaire items. The participants rated the questionnaire items on a five-point scale from 1 (never) to 5 (always). To determine the construct validity of the questionnaire and ascertain the number of components for each factor, a pilot test applied on a sample of students from different faculties in different universities and the questionnaire were distributed on 320 students through Google survey. Only 274 questionnaires have returned, and the principal component analysis (PCA) has applied to determine the number of components.

Items were eliminated after applying PCA within each category and taking reliability and correlations into account. The instruments were then further fine-tuned until the item loadings and validity coefficients were sufficient. Consequently 16 items were deleted due to the low correlation values, leaving 15 items only and the Cronbach's alpha coefficient was (.85). Three proposed components were revealed by this procedure, Table 2. The first component represents ghost-writing assignments (GWA) which consists of seven items and refers to having assignments completed by someone else on the student's behalf. The second component represents students' inappropriate referencing (SIR) consists of five items which refers to deceiving readers by dishonestly acknowledging primary sources. The third component represents students' egregious plagiarism (SEP) three items make up egregious plagiarism (SEP), which is the term for using another person's content as one's own without giving proper credit.

The correlations were sufficiently strong, exceeding the recommended threshold of (.6) (Kaiser, 1974), as evidenced by the high (.86) Kaier-Meyer-Olkin score of sampling adequacy among the variables, and the Bartlett's Test of Sphericity (1195.750) reached statistical significance level ( $p=0.00$ ). Using the pertinent data, the varimax rotation approach was used to generate an adequate factor solution. The

preserved items met the following criteria: an eigenvalue of  $> 1.0$  (Fabrigar et al., 1999) and a factor loading of at least (.34) on the defining component (Hair et al., 1998).

Table 2: Practices of academic plagiarism loading of factor rotated solution and the Cronbach's Alpha coefficient.

Factor	Item	Factor loading			Cronbach's alpha coefficient
		F1	F2	F3	
Practices of Academic Plagiarism	Ghost-writing Assignments (GWA)	F1	F2	F3	
	1- The assignments written for me by others.	.759			.79
	2- Submitting another student's homework as my own.	.698			
	3- Falsely claiming I have used materials and tools in assignments that have written for me.	.687			
	4- Letting others submit the homework I wrote as their own.	.698			
	5- Relying on others to write my personal scientific tasks	.580			
	6- Falsely claiming authorship of reports completed by someone else.	.499			
	7- Purchasing scientific reports from ghost-writing services.	.529			
	Students' inappropriate referencing (SIR)				.76
	1- Using multiple internet sources in assignments without citations.		.750		
	2- Inconsistent in citing the sources used in my reports and seminars.		.649		
	3- Engaging in plagiarism while writing a report.		.713		
	4- Using someone's research from		.590		

	the internet as my own without crediting the author.				
	5- Taking scientific projects from the internet without identifying their sources.	.442			
	Students' egregious plagiarism (SEP)				
	1- Copying a single internet article word for word into my homework.	.775			.65
	2- Preparing my assignments on time depending on copying materials from the Internet.	.725			
	3- Relying on articles sourced entirely from the internet for report preparation	.715			
Overall Alpha					.85
% of variance	F1= 33.244%	F2= 10.484 %	F3= 8.373 %		
Eigenvalue	4.987	1.573	1.256		
Total variance explained is	52.102%				

#### 4. Result

PCA has employed to test the construct validity and as a result, the same 15 items as well as the three proposed components were retained based on the following criteria: the solution was constrained by an eigenvalue of  $\geq 1.0$  (Fabrigar et al., 1999) and factor loading that was of at least .34 on the defining component (Hair et al., 1998). The total variance explained was 49.443 % of the components. The GWA variance was 31.200 %, and the variance of the SIR was 9.742 %, while SEP variance was 8.501%. The first component had the highest eigenvalue of 4.680, and the second component was 1.461 followed by the third component 1.275. The three components' factor loadings were substantial enough to show statistical significance at the level  $p=0.00$ , the loadings of the third factor ranged from 0.771 for the first item to 0.676 for the third item. The reliability of the three components and the overall scale in Table 3 was assessed using the Cronbach's alpha coefficient.

Table 3: Practices of academic plagiarism loading of three factor rotated solution and the Cronbach's Alpha coefficient.

Factor	Item	Factor loading			Cronbach's alpha coefficient	
		F1	F2	F3		
Practices of Academic Plagiarism	Ghost-writing Assignments (GWA)					
	1- The assignments written for me by others.	.729			.77	
	2- Submitting another student's homework as my own.	.697				
	3- Falsely claiming I have used materials and tools in assignments that have written for me.	.666				
	4- Letting others submit the homework I wrote as their own.	.619				
	5- Relying on others to write my personal scientific tasks	.560				
	6- Falsely claiming authorship of reports completed by someone else.	.529				
	7- Purchasing scientific reports from ghost-writing services.	.529				
	Students' inappropriate referencing (SIR)					.74
	1- Using multiple internet sources in assignments without citations.		.706			
	2- Inconsistent in citing the sources used in my reports and seminars.		.697			
	3- Engaging in plagiarism while writing a report.		.697			
	4- Using someone's research from the internet as my own without crediting the author.		.585			
	5- Taking scientific projects from the internet without identifying their sources.		.506			

	Students' egregious plagiarism (SEP)			
	1- Copying a single internet article word for word into my homework.		.771	.62
	2- Preparing my assignments on time depending on copying materials from the Internet.		.724	
	3- Relying on articles sourced entirely from the internet for report preparation		.676	
Overall Alpha				.83
% of variance	F1=31.200%	F2= 9.742%	F3= 8.501%	
Eigenvalue	4.680	1.461	1.275	
Total variance explained is	49.443%			

Descriptive statistics have been performed, as shown in Table 4, to determine the prevalence of practicing academic plagiarism among university students. A mean score of  $M = 56.26$  and a standard deviation of  $SD = 6.836$  were obtained by analyzing the Likert scale responses (1 = never, 5 = often) on the perception and practice of academic plagiarism. These scores indicated an average tendency lying between 'sometimes' and 'always'. This implies that the students have a moderate tendency to plagiarize.

Table 4: Descriptive statistics on the prevalence of practicing academic plagiarism

Questionnaire	n	Mean	SD	Range		Skewness	Kurtosis
Academic plagiarism	496	56.26	6.836	Minimum	Maximum	-.361	.054
				27	75		

Table 5 present the analysis of three commonly observed plagiarism practices among university students, to identify the most common practices among them. The ghost-writing assignments were identified as the most common practice among students with  $M = 25.733$ , and  $SD=3.750$ . Following a considerable rate of inappropriate referencing among students with the  $M = 18.671$ , and  $SD=2.744$ . Conversely, students' egregious plagiarism displayed a relatively lower frequency with the  $M = 11.858$ , and  $SD=2.087$ .



Table 5: Descriptive statistics of scores on the three components of practices of academic plagiarism

	n	Range		Mean	Std. Deviation	Skewness	Kurtosis
		Minimum	Maximum				
GWA	496	14.00	35.00	25.7339	3.75052	-.703	-.433
SIR	496	7.00	25.00	18.6714	2.74485	-.329	.334
SEP	496	4.00	15.00	11.8589	2.08706	-.703	.175

To find out whether there is a significant difference in academic plagiarism practices among students based on gender, the Independent samples t-test was employed, as shown in Table 6. The study's findings demonstrated that there were no statistically significant differences between male and female students ( $t_{49} = 274, p = 0.54$ ), or  $p \geq 0.05$ ). For female students, the mean and standard deviation were  $M = 56.32, SD = 6.919$ , while for male students, they were  $M = 56.14, SD = 6.678$ , this suggests that both sexes have equally committed academic plagiarism.

Table 6: Independent sample T.test of practicing academic plagiarism based on gender

	Gender	N	Mean	SD	Levene's Test for Equality of Variances		Sig
					t	df	
Practicing academic plagiarism	Male	161	56.14	6.678	.274	494	.542
	Female	335	56.32	6.919			

To examine whether students' academic plagiarism practices vary significantly based on their field of study (humanities or science). The Independent samples t-test in Table 7 shows a statistically significant difference ( $t_{489} = 1.708, p = 0.04$ ) ( $p \leq 0.05$ ) between the humanities and science fields students, with a mean and standard deviation of SEP based on science fields  $M = 12.03, SD = 2.01$  and mean and standard deviation of students in the humanities fields  $M = 11.71, SD = 2.13$ . This indicates that students in science fields are more likely than those in humanities fields to engage in egregious plagiarism. Following the SIR mean and standard deviation based on science fields  $M = 18.51, SD = 2.76$ , and a mean and standard deviation of humanities fields students  $M = 18.80, SD = 2.72$ , and the GWA mean and standard deviation based on science fields  $M = 26.09, SD = 3.83$ , and a mean and standard deviation of humanities fields students  $M = 25.42, SD = 3.65$  indicating no statistically significant differences SIR ( $t_{49} = -1.206, p = 0.87$ ), GWA ( $t_{49} = 1.974, p = 0.83$ ) between humanities and science field students in practicing the academic plagiarism.

Table 7: Independent sample T.test of practicing academic plagiarism according to discipline-based

	Discipline	N	Mean	SD	Levene's Test for Equality of Variances		Sig
					t	df	
SEP	Sciences	229	12.03	2.01			.045
	Humanities	267	11.71	2.13	1.708	489.589	
SIR	Sciences	229	18.51	2.76	-1.206	494	.874
	Humanities	267	18.80	2.72			
GWA	Sciences	229	26.09	3.83	1.974	494	.835
	Humanities	267	25.42	3.65			

## 5. Discussion

This study aimed to investigate the academic plagiarism practices of university students. The results indicated a moderate tendency among students to engage in plagiarism. Similarly, Nabee, Mageto, and Pisa (2020) have revealed moderate levels of plagiarism among students. This suggests that academic plagiarism exists as a notable concern within the university environment. It is likely that students do not comprehend what constitutes plagiarism (Burgason, Sefiha, & Briggs, 2019; Waltzer & Dahl, 2023), which may result in more engagement in academic dishonesty (Elias & Farag, 2010).

The ghost-writing assignments emerged as the most prevalent practice among students, indicating a high frequency. This is followed by inappropriate referencing, while egregious forms of plagiarism were reported with relatively lower frequency. This finding is in line with (Peytcheva-Forsyth, Mellar, & Aleksieva, 2019) who found contract cheating surpassed plagiarism as the subject of greatest concern among students, and (Ali & Hassan, 2021) who found ghost-writing as a major problem in higher education worldwide because it's difficult to detect. These findings, along with previous research, consistently identify ghost-writing as the most prevalent form of plagiarism among students, especially in Iraq. concerning type of plagiarism among students, particularly in Iraq. The COVID-19-induced shifting to online learning, along with the reliance on written reports as the sole method for student evaluation during that period, appears to have fostered a persistent inclination towards ghost-writing. This trend is particularly prevalent in universities in the Kurdistan region, where faculty members have limited access to plagiarism detection tools.

According to discipline-based, statistically significant differences were found between humanities and sciences fields in one type of plagiarism, a higher tendency among sciences fields students were found to engage in egregious plagiarism compared to their peers in humanity fields. This was inconsistent with the earlier study that pointed out instances of academic plagiarism particularly within the humanities (Cajigas et al., 2022; Eshet, 2023). While it was consistent with the differences found in the students' responses across different specializations, with a preference for science fields (Hussein, 2022; Ledwith, Risquez, & O'Dwyer, 2010). The AI platforms may serve as a stimulus for scientific students' to engage more in plagiarizing because they are more skilled at using ICT and have higher computing self-efficacy (Abdullah et al., 2015). However, a recent study suggested that concerns related to plagiarism and priority disputes are not confined to specific academic fields (Vasconcelos et al., 2023).

Furthermore, no notable differences were found within specific practices such as inappropriate referencing and ghost-writing assignments. This consistency in the other two types of plagiarism practices across disciplines might be indicative of shared challenges or issues present in both humanities and science fields. Such as, factors like social norms, academic workload, access to resources, lack of writing skills, or a lack of emphasis on proper citation, and original writing could be contributing to the parallel prevalence of inappropriate referencing and ghost-writing assignments across these fields (Allen, Lourenco, & Roberts, 2016; Costley, 2019; Kadayam et al., 2023; Shbail et al., 2022).

Furthermore, the study found no statistically significant differences between male and female students in terms of academic plagiarism. This suggests that both genders exhibit a similar inclination toward engaging in such behaviors. Certain studies have suggested differences in the mean responses of participants by gender, favoring male students (Hussein, 2022; Hensley, Kirkpatrick, & Burgoon, 2013). Conversely, other research has indicated that both male and female students engage in plagiarism at similar rates despite of their underlying motivations (Pagaddu, 2021; Ip et al., 2018), and gender is not thought to play a role in academic plagiarism (Nabee, Mageto, & Pisa, 2020).

The findings of this study highlight the necessity of all-encompassing approaches to lessen these pervasive instances of plagiarism and uphold the ethical standards for academic writing in Iraq. Institutions need to develop effective strategies to address the prevalent issue of students' egregious plagiarism, ghost-writing assignments, and inappropriate referencing. Enhancing assessment procedures, for example, could involve creating a trustworthy assessment rubric to assess written assignments and encouraging originality in assignments by providing plagiarism detection software under the academics hands. Stricter referencing requirements must be implemented to discourage the practice of outsourcing, and faculty members must impose serious penalties to discourage students from participating in such conduct. Additionally, it is crucial to give students workshops and seminars on plagiarism, academic writing, and using AI platforms.

## **6. Conclusion**

This study aimed to determine the internal structure of the questionnaire and to understand how students engage in plagiarism, concerning the most common plagiarism practices, gender, and discipline based. The findings revealed a good construct validity and reliability of the questionnaire, and a moderate tendency among students to engage in plagiarism practices, ghost-writing assignments were identified as the most common practice among students, this was followed by inappropriate referencing, while egregious forms of plagiarism were reported with relatively lower frequency. No gender differences were found in practicing plagiarism. While differences were found between humanities and science field students in egregious plagiarism, a higher tendency among sciences field students was found to engage in this type of plagiarism.

The results emphasize the need for multimodal interventions that prioritize institutional strategies, disciplinary issues, and educational awareness to promote ethical thinking among students and reduce plagiarism, especially in an area where there is a dearth of such research. Continued research efforts are essential to combat plagiarism in the digital age, particularly focusing on the effects of study exhaustion on the misuse of information technology for academic misconduct in higher education. Furthermore,

investigating the core causes of disciplinary discrepancies and developing efficient preventive measures against academic dishonesty in the age of artificial intelligence could be advantageous.

**Conflict of interest:**

“There is no conflict of interest for this paper.”

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