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ARTICLE

UNDERSTANDING ARTIFICIAL INTELLIGENCE KNOWLEDGE AND USAGE AMONG COLLEGE STUDENTS: INSIGHTS FROM A SURVEY ON CLASSROOM, COURSEWORK, AND PERSONAL APPLICATIONS

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ABSTRACT | Objective: This cross-sectional study involved distributing a survey to a sample of undergraduate college students AI-related knowledge, attitudes, and behaviors. **Method:** A total of 258 out of 319 college students enrolled in a personal wellness elective completed this survey during class. **Results:** Most participants (53.5%) reported familiarity with AI in general, often learning about it through the internet (79.1%). Participants who were frequent AI users more often said they were familiar with AI in general (62.3% vs. 47.1%, $p = 0.04$) and for educational purposes (52.3% vs. 34.8%, $p = 0.02$) and more frequently encountered AI information during class (42.5% vs. 23.9%, $p = 0.002$) compared with infrequent AI users. Frequent AI users more often agreed that AI makes learning easier (67.9% vs. 47.8%, $p = 0.007$), that AI use in school is ethical (27.2% vs. 8.1%, $p < 0.001$), that AI improves writing skills (78.5% vs. 56.5%, $p < 0.001$), improves critical thinking (36.2% vs. 19.7%, $p = 0.004$), and improves interpersonal communication (38.3% vs. 24.8%, $p = 0.035$) compared to participants who less frequently used AI. Infrequent AI users more often agreed that using AI in class or for homework was cheating (56.6%, 25.2%, $p < 0.001$), more often disagreed that they trusted AI as safe (51.1% vs. 26.2%, $p < 0.001$), and more often turned to family and friends for information about AI (29.0% vs. 17.8%, $p = 0.04$) than frequent AI users. **Conclusion:** Research into the role of AI in education is still preliminary, but this work can serve as a foundation for future studies.

Keywords | Artificial Intelligence, Higher Education, User Behavior, Ethical Perceptions, Learning





INTRODUCTION

Artificial intelligence (AI) refers to advanced computational systems that are engineered to perform tasks by predicting outcomes, suggesting actions, and making decisions, thereby impacting both real and virtual environments (U.S. Department of State, n.d.). Significant advancements have been made since Dr. Alan Turing's seminal work in AI took place in the 1950s. Originally designed to determine if a machine's behavior is indistinguishable from that of a human, the Turing Test laid the groundwork for the broader field of AI (The Kirby Foundation, 2022).

Today, AI encompasses complex problem-solving and learning capabilities that continue to transform technology and society. The application of AI in educational settings has undergone significant technological advancements over the past decade. A 2023 systematic review of AI use in higher education identified its most prevalent applications: assessing and evaluating students, predicting student outcomes, deploying AI assistants such as chatbots, implementing Intelligent Tutoring Systems (ITS), and managing student learning (Crompton & Burke, 2023; Labadze et al., 2023). These advancements have introduced exciting new capabilities in the education sector, enhancing student engagement and productivity, enabling personalized learning experiences, and improving accessibility. However, they also raise important ethical concerns (Stahl et al., 2022). Among the ethical issues raised by these advancements are potential cheating, AI-induced biases and discrimination, concerns over information transparency and privacy, risks of misuse, impacts on vulnerable groups and employment, and concerns about the emergence of machine consciousness (Pearson PLC, 2024; Stahl et al., 2022).

The widespread adoption and rapid advancements of AI in U.S. higher education are creating new academic opportunities and enriching learning experiences, while also raising concerns about academic integrity (Southworth et al., 2023). A systematic review conducted in 2024 reports that the most often cited benefit of AI use in academic research is time efficiency as it has the potential to streamline the generation of research ideas, data analysis, and manuscript preparation. However, this review simultaneously highlights the prevalence of significant ethical concerns associated with AI use in academia, such as plagiarism, data accuracy, and privacy. (Castillo-Martínez et al., 2024). Similarly, some scholars suggest that the use of AI in higher education stifles the development of problem solving and critical thinking skills (Wang et al., 2024). However, the positive impact assistive AI technologies (text to speech, speech to text, zoom, predictive text, spell checkers, etc.) have had on enhancing and enriching educational opportunities for those with disabilities, and the population in general, should not be minimized (Popenici & Kerr, 2017).

Integration of AI in education is not limited to the United States; studies conducted in various countries have explored its impact and effectiveness. For instance, a survey conducted among college students in Hong Kong, China, found that most students acknowledged both the advantages and disadvantages of increased AI use in higher education. Respondents highlighted personalized learning support as a key benefit while expressing concerns about issues related to accuracy, privacy, and ethics (Chan & Hu, 2023). A study conducted in Sweden found that while most students view AI use positively, a significant number also express concerns about its potential widespread adoption in the future, with males and engineering students showing a more favorable perspective than



females and students in the humanities or medicine (Stöhr et al., 2024). Another study evaluated the integration of AI in Saudi Arabia's higher education, revealing through a survey of 1113 participants that stakeholders are generally positive about AI's potential to enhance educational practices, while emphasizing the importance of addressing ethical concerns such as privacy and bias (Al-Zahrani & Alasmari, 2024).

A report from spring of 2024 found that over half of college students reported that AI helped them to achieve better grades and be more efficient (Ruediger et al., 2024). These numbers are in stark contrast to college faculty perspectives on AI use in the classroom; despite 72% of faculty experimenting with AI, only 19% felt that AI use in the classroom would have a positive impact on student learning, and 42% of faculty completely banned their students from using AI (Ruediger et al., 2024). Overall, these results suggest the existence of a "digital divide" between students and faculty regarding the adoption of AI use (Coffey, 2024). Considering that most current undergraduate students have or will interact with AI educational tools, faculty members need to develop clear university and classroom policies governing the use of AI. Current US based research on the varied perspectives of students regarding AI use in higher education is insufficient. Therefore, assessing and comparing both student and faculty perspectives on AI in higher education is crucial to updating and shaping university policies, helping to bridge the digital divide and improve educational experiences for all parties involved.

Given the prevalence of research pertaining to perspectives on AI use in higher education in other countries (Al-Zahrani & Alasmari, 2024; Chan & Hu, 2023; Stöhr et al., 2024), it is important that similar research be conducted in the United States to demonstrate current outlooks on this rapidly changing technology. This can assist faculty and university policymakers in integrating AI into higher education, particularly considering AI's rapid integration across all aspects of life and its significant impact on the labor market (Nestor Maslej et al., 2024; Organization for Economic Cooperation and Development (OECD), 2019). The purpose of this study was to assess knowledge, attitudes, and behaviors regarding AI use in the classroom, for coursework, and in everyday life.

METHODS

We coordinated with instructors to conduct surveys during the in-person sessions of Healthy U (PBHL1100), an introductory public health course offered by the Department of Public Health in the fall 2024 semester. The course comprised ten sections, and with instructors' permission, all students present were invited to voluntarily participate in a paper survey about artificial intelligence. The survey's anonymity was emphasized, and students were informed that their participation would not affect their grades. Each consenting student was given 15 minutes to complete the survey, preceded by an informed consent form outlining the minimal risks and benefits involved. The sampling frame was limited to students enrolled in the 10 in-person sessions of this specific course, eliminating any potential for participant duplicity. Of 319 college students who were present in class, 258 completed this self-administered survey (81% response rate). PBHL1100, an introductory public health course, is open to all university students, not just those studying public health. It fulfills part of the Core



Curriculum as a designated UCC-1 Personal Well Being course. Therefore, the results of this course reflect a wide-ranging demographic of college students.

We collected general demographic information that included gender, race/ethnicity, age, and whether the participant's study major was related to health or science. To capture knowledge of AI, we posed questions to assess how familiar the participant was with AI use in general and specifically for educational purposes. Sources consulted to learn about AI; and how often in the past 12 months AI information was encountered in day-to-day life and as part of their education (daily, weekly, monthly, or never); were also used to determine AI knowledge. Participants were asked their level of agreement to a series of questions to examine attitudes toward AI and professors' receptivity to the use of AI in education, and whether professors had discussed AI in the context of school assignments or use in future employment. We additionally evaluated attitudes toward AI in learning with several questions such as "AI makes learning complex" and "AI used for in-class homework is cheating." we assessed participant attitudes toward how AI has impacted their education to determine whether AI improves or worsens writing skills, creativity, mathematical skills, critical thinking, and interpersonal communication. Lastly, AI technology use (e.g., face recognition function on a smart phone, "For You" section on social media, fitness tracker, and chatbot) was examined by frequency (daily, weekly, monthly, or never). Frequency of AI use was dichotomized and recoded as "infrequent" = monthly or never vs. "frequent" = daily or weekly. Governmental and scientific briefs served as references for the survey's development (Cardona et al., 2023; European Parliament, 2023; Kennedy et al., 2023; Organization for Economic Cooperation and Development (OECD), 2019).

Data Analysis

We performed descriptive data analyses including chi square test or Fisher's exact test and Analysis of Variance (ANOVA) to test for associations between frequency of AI use and other study covariates. P values <0.05 were considered statistically significant and IBM SPSS version 29 (IBM Corp., 2024) was used to conduct all analyses.

Permission

This study was approved by the IRB at William Paterson University under Protocol # 2024-338 for human subject participation.

RESULTS

Demographic characteristics and knowledge of AI among college students are noted in Table 1. Of 319 college students approached, 258 completed this self-administered survey (81% response rate). The majority of participants were female (n = 168, 65.1%), Black/African American (n = 76, 29.5%), or Hispanic (n = 80, 31.0%) with a mean age of 18.3 years [SD 1.2]. More than half of the participants stated that they were familiar with AI in general (n = 138, 53.5%) and frequently encountered AI



information outside of the school setting (56.2%) and only 31.8% ($n = 82$) reported they encountered AI in class. The internet was cited as the most common (79.1%) source of AI information. Participants who were frequent AI users more often said they were familiar with AI in general (62.3% vs. 47.1%, $p = 0.04$) and for educational purposes (52.3% vs. 34.8%, $p = 0.02$) and more frequently encountered AI information during class (42.5% vs. 23.9%, $p = 0.002$) compared with infrequent AI users. Infrequent AI users more often turned to family and friends for information about AI (29.0% vs. 17.8%, $p = 0.04$) than frequent AI users.

Table 1. Demographic characteristics and knowledge of AI among college students ($n = 258$).

	Total	Infrequent AI user ($n=138$, 56.3%)	Frequent AI user ($n=107$, 43.7%)	P value
DEMOGRAPHICS				
Sex				0.75
Female	168 (65.1)	91 (65.9)	70 (65.4)	
Male	86 (33.3)	45 (32.9)	36 (33.6)	
Other	3 (1.2)	1 (0.7)	1 (0.9)	
Prefer not to say	1 (0.4)	1 (0.7)	0 (0.0)	
Race/ethnicity				0.65
Amer Ind/Alask Nat	1 (0.4)	0 (0.0)	1 (0.9)	
Asian	22 (8.5)	10 (7.2)	11 (10.3)	
Black/African Amer	76 (29.5)	42 (30.4)	30 (28.0)	
Hispanic	80 (31.0)	42 (30.4)	31 (29.0)	
White	54 (20.9)	31 (22.5)	22 (20.6)	
Other	9 (3.5)	3 (2.2)	6 (5.6)	
More than 1 race	12 (4.7)	8 (5.8)	4 (3.7)	
Prefer not to say	4 (1.6)	2 (1.4)	2 (1.9)	
Major related to health or science				0.33
Yes	130 (50.4)	69 (51.1)	48 (44.9)	
No	124 (48.1)	66 (48.9)	59 (55.1)	
Missing	4 (1.6)	--	--	
Age				0.69
Mean [SD]	18.3 [1.2]	18.3 [1.2]	18.3 [0.97]	
Range	16-26	16-26	17-25	
Median [IQR]	18 [18-18]	18 [18-18]	18 [18-18]	
AI KNOWLEDGE				
Familiarity with AI in general				0.04
Familiar	138 (53.5)	65 (47.1)	66 (62.3)	
Somewhat familiar	104 (40.3)	63 (45.7)	37 (34.9)	
Unfamiliar	15 (5.8)	10 (7.2)	3 (2.8)	
Missing	1 (0.4)	--	--	



	Total	Infrequent AI user (n=138, 56.3%)	Frequent AI user (n=107, 43.7%)	P value
Familiarity with AI for educational purposes				
Familiar	110 (42.6)	48 (34.8)	56 (52.3)	0.02
Somewhat familiar	113 (43.8)	69 (50.0)	39 (36.4)	
Unfamiliar	35 (13.6)	21 (15.2)	12 (11.2)	
Sources of information about AI				
TV	28 (10.9)	16 (11.6)	9 (8.4)	0.41
Internet	204 (79.1)	110 (79.7)	85 (79.4)	0.96
Family/friends	64 (24.8)	40 (29.0)	19 (17.8)	0.04
Professors/school	78 (30.2)	47 (34.1)	26 (24.3)	0.10
Social media	156 (60.5)	79 (57.2)	70 (65.4)	0.19
Print media	24 (9.3)	15 (10.9)	9 (8.4)	0.52
Other	2 (0.8)	2 (1.4)	0 (0.0)	0.59
Encountered AI info outside of school				
Frequently	145 (56.2)	73 (53.7)	66 (62.3)	0.18
Infrequently	110 (42.6)	63 (46.3)	40 (37.7)	
Missing	3 (1.2)	--	--	
Encountered AI info during class				
Frequently	82 (31.8)	33 (23.9)	45 (42.5)	0.002
Infrequently	175 (67.8)	105 (76.1)	61 (57.5)	
Missing	1 (0.4)	--	--	

Attitudes toward AI used in education among college students by frequency of current are highlighted in Table 2. Two-thirds of participants (n = 172, 66.7%) agreed that students should receive training on the safe use of AI in education, 59.7% (n = 154) agreed that AI will change school assignments in the future, and 45.3% felt that the use of AI for educational purposes needs to be regulated. Although 69.4% (n = 179) disagreed that AI has caused them to rethink their future career goals, there were mixed feelings about whether AI will contribute to job insecurity. Many (n = 161, 62.4%) stated that their professors were receptive to the use of AI in class or for coursework with frequent AI users more inclined to agree with this statement (71.7% vs. 56.9%, p = 0.018). Infrequent AI users more often agreed that AI for education needs to be regulated (53.3% vs. 36.2%, p = 0.028) and that professors have discussed effective AI use for their future job (76.5% vs. 56.1%, p = 0.001) but less often agreed that professors have discussed AI for assignments (28.5% vs. 44.2%, p = <0.001).



Table 2. Attitudes toward AI used in education among college students by frequency of current AI use (n = 258).

	Total	Infrequent AI user (n=138, 56.3%)	Frequent AI user (n=107, 43.7%)	P value
Use of AI for education needs to be regulated				
Agree	117 (45.3)	72 (53.3)	38 (36.2)	0.028
Neutral	102 (39.5)	46 (34.1)	51 (48.6)	
Disagree	34 (13.2)	17 (12.6)	16 (15.2)	
Missing	5 (1.9)	--	--	
AI will change school assignments in the future				
Agree	154 (59.7)	77 (55.8)	70 (65.4)	0.22
Neutral	82 (31.8)	49 (35.5)	27 (25.2)	
Disagree	22 (8.5)	12 (8.7)	10 (9.3)	
Students should receive training on safe use for AI in education				
Agree	172 (66.7)	88 (63.8)	74 (69.2)	0.53
Neutral	60 (23.3)	37 (26.8)	22 (20.6)	
Disagree	26 (10.1)	13 (9.4)	11 (10.3)	
AI has caused me to rethink my future career goals				
Agree	34 (13.2)	19 (13.9)	15 (14.2)	0.85
Neutral	42 (16.3)	21 (15.3)	19 (17.9)	
Disagree	179 (69.4)	97 (70.8)	72 (67.9)	
Agree	3 (1.2)	--	--	
AI will contribute to job insecurity				
Agree	121 (20.5)	72 (52.2)	45 (42.5)	0.25
Neutral	83 (32.2)	42 (30.4)	35 (33.0)	
Disagree	53 (20.5)	24 (17.4)	26 (24.5)	
Missing	1 (0.4)	--	--	
AI threatens my security and privacy				
Agree	74 (28.7)	44 (33.1)	27 (25.7)	0.38
Neutral	108 (41.9)	58 (43.6)	47 (44.8)	
Disagree	65 (25.2)	31 (23.3)	31 (29.5)	
Missing	11 (4.3)	--	--	
Receptivity of professors to use of AI in class or for coursework				
Receptive	161 (62.4)	78 (56.9)	76 (71.7)	0.018
Unreceptive	94 (36.4)	59 (43.1)	30 (28.3)	
Missing	3 (1.2)	--	--	
My professors have discussed effective use of AI for assignments				
Agree	89 (34.5)	39 (28.5)	46 (44.2)	<0.001
Neutral	55 (21.3)	24 (17.5)	28 (26.9)	
Disagree	110 (42.6)	74 (54.0)	30 (28.8)	
Missing	4 (1.6)	--	--	



	Total	Infrequent AI user (n=138, 56.3%)	Frequent AI user (n=107, 43.7%)	P value
My professors have discussed effective use of AI for my future job				
Agree	31 (12.0)	8 (5.8)	19 (17.8)	0.001
Neutral	54 (20.9)	24 (17.5)	28 (26.2)	
Disagree	172 (66.7)	105 (76.5)	60 (56.1)	
Missing	1 (0.4)	--	--	

Table 3 depicts attitudes about the use of AI in education and impact on learning among college students by frequency of current AI use. Many participants (n = 113, 43.8%) expressed neutral feelings (neither agreeing or disagreeing) that AI makes learning more complex, and that AI is safe to use (n = 119, 46.1%). More than half (n = 143, 55.4%) of the participants agreed that AI makes learning easier but 41.9% (n = 108) thought that the use of AI for in-class or for homework was cheating. Two-thirds (n = 173, 67.1%) of participants felt that using AI improves their writing skills but had mixed feelings on whether or not AI improves creativity, mathematics skills, critical thinking, or interpersonal communication. Frequent AI users more often agreed that AI makes learning easier (67.9% vs. 47.8%, p = 0.007), that AI use in school is ethical (27.2% vs. 8.1%, p<0.001), that AI improves writing skills (78.5% vs. 56.5%, p <0.001), improves critical thinking (36.2% vs. 19.7%, p =0.004), and improves interpersonal communication (38.3% vs. 24.8%, p = 0.035) compared to participants who less frequently used AI. Infrequent AI users more often agreed that using AI in class or for homework was cheating (56.6%, 25.2%, p <0.001) and more often disagreed that they trusted AI as safe (51.1% vs. 26.2%, p <0.001).

Table 3. Attitudes about the use of AI in education and impact on learning among college students by frequency of current AI use (n = 258).

	Total	Infrequent AI user (n=138, 56.3%)	Frequent AI user (n=107, 43.7%)	P value
ATTITUDES TOWARD AI AND LEARNING				
AI makes learning more complex				
Agree	38 (14.7)	15 (10.9)	21 (19.8)	0.053
Neutral	113 (43.8)	69 (50.0)	39 (36.8)	
Disagree	106 (41.1)	54 (39.1)	46 (43.4)	
Missing	1 (0.4)	--	--	
AI makes learning easier				
Agree	143 (55.4)	66 (47.8)	72 (67.9)	0.007
Neutral	88 (34.1)	54 (39.1)	26 (24.5)	
Disagree	26 (10.1)	18 (13.0)	8 (7.5)	
Missing	1 (0.4)	--	--	
AI used in-class or for homework is cheating				
Agree	108 (41.9)	77 (56.6)	26 (25.2)	<0.001
Neutral	95 (36.8)	42 (30.9)	50 (48.5)	
Disagree	49 (19.0)	17 (12.5)	27 (26.2)	
Missing	6 (2.3)	--	--	



	Total	Infrequent AI user (n=138, 56.3%)	Frequent AI user (n=107, 43.7%)	P value
I trust AI is safe				
Agree	34 (13.2)	13 (9.6)	19 (17.8)	<0.001
Neutral	119 (46.1)	53 (39.3)	60 (56.1)	
Disagree	102 (39.5)	69 (51.1)	28 (26.2)	
Missing	3 (1.2)	--	--	
I trust AI provides accurate information				
Agree	44 (17.1)	19 (14.0)	22 (21.4)	0.015
Neutral	135 (52.3)	68 (50.0)	61 (59.2)	
Disagree	73 (28.3)	49 (36.0)	20 (19.4)	
Missing	6 (2.3)	--	--	
AI use for school assignments is ethical				
Agree	40 (15.5)	11 (8.1)	28 (27.2)	<0.001
Neutral	140 (54.3)	69 (51.1)	64 (62.1)	
Disagree	70 (27.1)	55 (40.7)	11 (10.7)	
Missing	8 (3.1)	--	--	
ATTITUDES TOWARD AI IMPACT ON LEARNING				
AI improves writing skills				
Improves	173 (67.1)	78 (56.5)	84 (78.5)	<0.001
No impact	32 (12.4)	18 (13.0)	13 (12.1)	
Worsens	53 (20.5)	42 (30.4)	10 (9.3)	
AI improves creativity				
Improves	97 (37.6)	38 (27.7)	53 (50.5)	<0.001
No impact	70 (27.1)	42 (30.7)	26 (24.8)	
Worsens	88 (34.1)	57 (41.6)	26 (24.8)	
Improves	3 (1.2)	--	--	
AI improves mathematical skills				
Improves	99 (38.4)	65 (47.1)	60 (56.1)	0.07
No impact	70 (27.1)	37 (26.8)	32 (29.9)	
Worsens	52 (20.2)	36 (26.1)	15 (14.0)	
AI improves critical thinking				
Improves	69 (26.7)	27 (19.7)	38 (36.2)	0.004
No impact	80 (31.0)	41 (29.9)	34 (32.4)	
Worsens	106 (41.1)	69 (50.4)	33 (31.4)	
Improves	3 (1.2)	--	--	
AI improves interpersonal communication				
Improves	81 (31.4)	34 (24.8)	41 (38.3)	0.035
No impact	102 (39.5)	57 (41.8)	43 (40.2)	
Worsens	74 (28.7)	46 (33.6)	23 (21.5)	
Improves	1 (0.4)	--	--	



DISCUSSION

The findings of this study offer important insights into college students' knowledge, attitudes, and behaviors related to AI in an educational. The majority of participants reported being familiar with AI (53.4%), largely informed by sources outside of school (56.2%), particularly the internet (79.1%). A study by McGrath and colleagues (2023) showed a general lack of AI knowledge among university teachers, pointing to a gap in formal education on the subject despite frequent student exposure to AI technologies (McGrath et al., 2023). Additionally, they suggest that there is a clear need for more resources to help educators effectively integrate AI into their teaching practices, amid concerns about fairness and skepticism (McGrath et al., 2023). K-12 teachers and students who have used ChatGPT report substantial enhancements in their teaching and learning experiences. The integration of tools like ChatGPT in K-12 education sets a new precedent for what incoming college students will know and expect from their higher education experience (Walton Family Foundation, 2023). Further research is needed to explore if and how AI is being integrated into college curricula, as well as to understand the reasons for its incorporation or omission.

Given the rising prevalence of AI, higher education institutions should reassess instructors' roles in teaching emergent AI skills, carefully considering the pros and cons of integrating these advancements into their curriculums (AlDhaen, 2022; Borisov & Stoyanova, 2024; Celik et al., 2022) and the possibility of co-design (Tatar et al., 2024). Beyond the classroom, the education sector falls short in harnessing the potential benefits of analytics compared to other industries (Chen et al., 2020). Future research can focus on the benefits and risks of making data-driven decisions to optimize student success (Berendt et al., 2020; National Center for Education Evaluation and Regional Assistance (NCEE), 2023; Ouyang et al., 2022).

Two-thirds of the respondents in this study believe that students need training on safe AI use, nearly 60% think AI will alter school assignments, and 45.3% advocate for AI regulation in education. Having said this, fewer than one-third of respondents (31.8%) reported encountering AI in class. This is aligned with other research, showing that nearly 70% of graduates believe basic AI training should be integrated into academic courses. Additionally, more than half of the respondents (55%) feel their degree programs did not adequately prepare them to utilize these tools in the workforce, according to a 2024 survey (Cengage Group, 2024). These results highlight gaps in higher education's approach to fulfilling the AI learning needs of college students.

Interestingly, despite regard for the importance of AI integration in schools, a significant portion of students (45.3%) expressed concerns about the need to regulate AI in education, with 41.9% reporting that the use of AI for in-class or for homework was cheating. While frequent users perceived more support from professors and had more positive attitudes, infrequent users favored stricter AI regulations in education and desired more structured discussions about AI's role academically and professionally. Despite these diverging views, educators are actively utilizing AI-generated text detection tools (Dwyer & Laird, 2024) to manage concerns around academic integrity, even though such tools have been criticized for their lack of precision (Coffey, 2024; Edwards, 2023; Fowler, 2023).

The finding that frequent AI users are more likely to engage with AI in educational settings (42.5% vs. 23.9%) suggests disparities in access to AI resources or educators' knowledge. These



users also tend to hold more positive views, crediting AI with enhancing writing, critical thinking, and communication skills. A study of teachers' motivations and intentions to teach AI found that self-perceived confidence about teaching AI was associated with teachers' intention to do so (Ayanwale et al., 2022). As such, ensuring educators themselves are well-versed in artificial intelligence use will likely promote instruction of the technology in the classroom. Further research is needed to determine alternative ways that students use AI. For instance, AI is being utilized not just as a tool for gaining information quickly but also as a means of managing social and academic demands that would traditionally require more personal effort or human interaction, this was found to be especially true in students with lower self-control (Rodríguez-Ruiz et al., 2024).

Student respondents in this study noted concerns about AI potentially leading to job insecurity. A shift in societal mindset towards equipping students with practical skills for an evolving workforce has led many colleges and universities to analyze their curricula to include AI training (Goulart et al., 2022; Surjadi, 2024). In fact, many employers share that they believe students must have AI skills to be competitive applicants and employees (Mowreader, 2024). A potential follow-up to this survey could expand upon a study conducted at an international university in Japan, where students identified potential unemployment as the primary ethical concern associated with AI (Ghotbi & Ho, 2021).

The limitations of this study stem from the sampling frame, which is restricted to students enrolled in the class and may not accurately represent all groups, potentially leading to overrepresentation or underrepresentation of certain demographics. Several factors influence the extent to which students are exposed to artificial intelligence use and policy within higher education. The timing of the survey administration also constrains the results, as students were surveyed at the start of the Fall 2024 semester and may have only recently encountered AI policy in their course syllabi. These factors could influence the accuracy of self-reported knowledge and awareness of technology policy related to their course requirements. The cross-sectional design limits the ability to generalize the results, and the use of a non-validated survey instrument may compromise the reliability and validity of the findings. Despite these limitations, our findings provide valuable insights into the knowledge, attitudes, and beliefs of a sample of college students that can serve as the basis for future studies. Research into the role of AI in education is still preliminary. A bibliometric analysis revealed that the depth and breadth of articles on AI in higher education is lacking and called for more widespread attention in the published literature on this topic (Hinojo-Lucena et al., 2019). Others noted that there is a trend in research papers in AI in higher education deriving from Computer Science and STEM fields, with more emphasis on prediction and evaluation than benefit and risk analysis (Zawacki-Richter et al., 2019). Addressing these gaps in future research can provide valuable insights for educators and policymakers on an important emerging issue.

REFERENCES

Al-Zahrani, A. M., & Alasmari, T. M. (2024). Exploring the impact of artificial intelligence on higher education: The dynamics of ethical, social, and educational implications. *Humanities and Social Sciences Communications*, 11(1), 912. <https://doi.org/10.1057/s41599-024-03432-4>



- AlDhaen, F. (2022). The use of artificial intelligence in higher education – Systematic review. In M. Alaali (Ed.), *COVID-19 Challenges to University Information Technology Governance* (pp. 269–285). Springer International Publishing. https://doi.org/10.1007/978-3-031-13351-0_13
- Ayanwale, M. A., Sanusi, I. T., Adelana, O. P., Aruleba, K. D., & Oyelere, S. S. (2022). Teachers' readiness and intention to teach artificial intelligence in schools. *Computers and Education: Artificial Intelligence*, 3, 100099. <https://doi.org/https://doi.org/10.1016/j.caeai.2022.100099>
- Berendt, B., Littlejohn, A., & Blakemore, M. (2020). AI in education: Learner choice and fundamental rights. *Learning, Media and Technology*, 45(3), 312–324. <https://doi.org/10.1080/17439884.2020.1786399>
- Borisov, B., & Stoyanova, T. (2024). Artificial intelligence in higher education: Pros and cons. *Science International Journal*, 3(2), 1–7. <https://doi.org/10.35120/sciencej0302001b>
- Cardona, M. A., Rodriguez, R. J., & Ishmael, K. (2023). *Artificial intelligence and the future of teaching and learning*. Retrieved October 31 from <https://www.ed.gov/sites/ed/files/documents/ai-report/ai-report.pdf>
- Castillo-Martínez, I. M., Flores-Bueno, D., Gómez-Puente, S. M., & Vite-León, V. O. (2024). AI in higher education: A systematic literature review. *Frontiers in Education*, 9. <https://doi.org/10.3389/feduc.2024.1391485>
- Celik, I., Dindar, M., Muukkonen, H., & Järvelä, S. (2022). The promises and challenges of artificial intelligence for teachers: A systematic review of research. *TechTrends*, 66(4), 616–630. <https://doi.org/10.1007/s11528-022-00715-y>
- Cengage Group. (2024). *2024 Graduate Employability Report: Preparing students for the GenAI-driven workplace*. Retrieved October 31 from <https://cengage.widen.net/s/bmjxxjx9mm/cg-2024-employability-survey-rep>
- Chan, C. K. Y., & Hu, W. (2023). Students' voices on generative AI: perceptions, benefits, and challenges in higher education. *International Journal of Educational Technology in Higher Education*, 20(1), 43. <https://doi.org/10.1186/s41239-023-00411-8>
- Chen, N.-S., Yin, C., Isaias, P., & Psotka, J. (2020). Educational big data: Extracting meaning from data for smart education. *Interactive Learning Environments*, 28(2), 142–147. <https://doi.org/10.1080/10494820.2019.1635395>
- Coffey, L. (2024). *Professors cautious of tools to detect AI-generated writing*. Retrieved October 31 from <https://www.insidehighered.com/news/tech-innovation/artificial-intelligence/2024/02/09/professors-proceed-caution-using-ai>
- Crompton, H., & Burke, D. (2023). Artificial intelligence in higher education: The state of the field. *International Journal of Educational Technology in Higher Education*, 20(1), 22. <https://doi.org/10.1186/s41239-023-00392-8>
- Dwyer, M., & Laird, E. (2024). *Ulp in the air: Educators juggling the potential of generative AI with detection, discipline, and distrust*. Retrieved October 31 from <https://cdt.org/wp-content/uploads/2024/03/2024-03-21-CDT-Civic-Tech-Generative-AI-Survey-Research-final.pdf>
- Edwards, B. (2023). *Why AI writing detectors don't work*. Retrieved October 31 from <https://arstechnica.com/information-technology/2023/07/why-ai-detectors-think-the-us-constitution-was-written-by-ai/>
- European Parliament. (2023). *What is artificial intelligence and how is it used?* Retrieved October 31 from <https://www.europarl.europa.eu/topics/en/article/20200827ST085804/what-is-artificial-intelligence-and-how-is-it-used>
- Fowler, G. A. (2023). We test a new ChatGPT-detector for teachers. It flagged an innocent student. *The Washington Post*. <https://www.washingtonpost.com/technology/2023/04/01/chatgpt-cheating-detection-turnitin/>
- Ghotbi, N., & Ho, M. T. (2021). Moral awareness of college students regarding artificial intelligence. *Asian Bioethics Review*, 13(4), 421–433. <https://doi.org/10.1007/s41649-021-00182-2>



- Goulart, V. G., Liboni, L. B., & Cezarino, L. O. (2022). Balancing skills in the digital transformation era: The future of jobs and the role of higher education. *Industry and Higher Education*, 36(2), 118-127. <https://doi.org/10.1177/09504222211029796>
- Hinojo-Lucena, F.-J., Aznar-Díaz, I., Cáceres-Reche, M.-P., & Romero-Rodríguez, J.-M. (2019). Artificial intelligence in higher education: A bibliometric study on its impact in the scientific literature. *Education Sciences*, 9(1), 51. <https://www.mdpi.com/2227-7102/9/1/51>
- IBM Corp. (2024). *IBM SPSS Statistics for Windows, Version 29.0*. In IBM Corp.
- Kennedy, B., Tyson, A., & Saks, E. (2023). *Public awareness of artificial intelligence in everyday activities*. Retrieved October 31 from <https://www.pewresearch.org/science/2023/02/15/public-awareness-of-artificial-intelligence-in-everyday-activities/>
- Labadze, L., Grigolia, M., & Machaidze, L. (2023). Role of AI chatbots in education: systematic literature review. *International Journal of Educational Technology in Higher Education*, 20(1), 56. <https://doi.org/10.1186/s41239-023-00426-1>
- McGrath, C., Cerratto Pargman, T., Juth, N., & Palmgren, P. J. (2023). University teachers' perceptions of responsibility and artificial intelligence in higher education - An experimental philosophical study. *Computers and Education: Artificial Intelligence*, 4, 100139. <https://doi.org/https://doi.org/10.1016/j.caeai.2023.100139>
- Mowreader, A. (2024). *Employers say students need AI skills. What if students don't want them?* Retrieved October 31 from <https://www.insidehighered.com/news/student-success/life-after-college/2024/10/03/are-ai-skills-key-part-career-preparation>
- National Center for Education Evaluation and Regional Assistance (NCEE). (2023). *Data-driven decision-making in education: How REL work makes a difference*. Retrieved October 31 from <https://ies.ed.gov/blogs/ncee/post/data-driven-decision-making-in-education-how-rel-work-makes-a>
- Nestor Maslej, Loredana Fattorini, Raymond Perrault, Vanessa Parli, Anka Reuel, Erik Brynjolfsson, John Etchemendy, Katrina Ligett, Terah Lyons, James Manyika, Juan Carlos Niebles, Yoav Shoham, Russell Wald, & Jack Clark. (2024). *The AI Index 2024 Annual Report* (AI Index Steering Committee, Institute for Human-Centered AI), https://aiindex.stanford.edu/wp-content/uploads/2024/05/HAI_AI-Index-Report-2024.pdf
- Organization for Economic Cooperation and Development (OECD). (2019). *Trends shaping education 2019*. Retrieved October 31 from https://www.oecd-ilibrary.org/education/trends-shaping-education-2019_trends_edu-2019-en
- Ouyang, F., Zheng, L., & Jiao, P. (2022). Artificial intelligence in online higher education: A systematic review of empirical research from 2011 to 2020. *Education and Information Technologies*, 27(6), 7893-7925. <https://doi.org/10.1007/s10639-022-10925-9>
- Pearson PLC. (2024). *End of semester AI report: More college students say AI is helping them get better grades*. Retrieved October 25 from <https://plc.pearson.com/en-GB/news-and-insights/news/end-semester-ai-report-more-college-students-say-ai-helping-them-get-better>
- Popenici, S. A., & Kerr, S. (2017). Exploring the impact of artificial intelligence on teaching and learning in higher education. *Research and Practice in Technology Enhanced Learning*, 12(1). <https://doi.org/10.1186/s41039-017-0062-8>
- Rodríguez-Ruiz, J., Marín-López, I., & Espejo-Siles, R. (2024). Is artificial intelligence use related to self-control, self-esteem and self-efficacy among university students? *Education and Information Technologies*. <https://doi.org/10.1007/s10639-024-12906-6>
- Ruediger, D., Blankstein, M., & Love, S. (2024). *Generative AI and postsecondary instructional practices: Findings from a national survey of instructors* Retrieved October 31 from <https://doi.org/10.18665/sr.320892>
- Southworth, J., Migliaccio, K., Glover, J., Glover, J., Reed, D., McCarty, C., Brendemuhl, J., & Thomas, A. (2023). Developing a model for AI across the curriculum: Transforming the higher education landscape via



- innovation in AI literacy. *Computers and Education: Artificial Intelligence*, 4, 100127. <https://doi.org/10.1016/j.caeai.2023.100127>
- Stahl, B. C., Antoniou, J., Ryan, M., Macnish, K., & Jiya, T. (2022). Organisational responses to the ethical issues of artificial intelligence. *AI & SOCIETY*, 37(1), 23-37. <https://doi.org/10.1007/s00146-021-01148-6>
- Stöhr, C., Ou, A. W., & Malmström, H. (2024). Perceptions and usage of AI chatbots among students in higher education across genders, academic levels and fields of study. *Computers and Education: Artificial Intelligence*, 7, 100259. <https://doi.org/https://doi.org/10.1016/j.caeai.2024.100259>
- Surjadi, M. (2024). Colleges race to ready students for the AI workplace. *The Wall Street Journal*. <https://www.wsj.com/us-news/education/colleges-race-to-ready-students-for-the-ai-workplace-cc936e5b>
- Tatar, C., Jiang, S., Rosé, C. P., & Chao, J. (2024). Exploring teachers' views and confidence in the integration of an artificial intelligence curriculum into their classrooms: A case study of curricular co-design program. *International Journal of Artificial Intelligence in Education*. <https://doi.org/10.1007/s40593-024-00404-2>
- The Kirby Foundation. (2022). *A brief history of AI*. Retrieved October 31 from <https://thefusioneer.com/blog/a-brief-history-of-ai/>
- U.S. Department of State. (n.d.). *Artificial intelligence (AI)*. Retrieved October 31 from <https://www.state.gov/artificial-intelligence>
- Walton Family Foundation. (2023). *Teachers and students embrace ChatCPT for education*. Retrieved October 31 from <https://www.waltonfamilyfoundation.org/learning/teachers-and-students-embrace-chatgpt-for-education>
- Wang, H., Dang, A., Wu, Z., & Mac, S. (2024). Generative AI in higher education: Seeing CHATGPT through universities' policies, resources, and Guidelines. *Computers and Education: Artificial Intelligence*, 7, 100326. <https://doi.org/10.1016/j.caeai.2024.100326>
- Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2019). Systematic review of research on artificial intelligence applications in higher education – where are the educators? *International Journal of Educational Technology in Higher Education*, 16(1), 39. <https://doi.org/10.1186/s41239-019-0171-0>

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