Comparing Student Attitudes of Cheating Behaviors in the Physical and Online Environments with an Emphasis on AI Usage

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Abstract: This study was conducted to compare students' beliefs about the seriousness of cheating behaviors in the physical and online environment and to analyze how these beliefs relate to self-reported cheating behaviors. Given the recent advances of artificial intelligence (AI) and its growing presence in the college classroom, specific emphasis is placed on cheating behaviors related to this technology. Using a quantitative descriptive approach, a survey was distributed to 328 undergraduate students at a small suburban college in the United States. Using a 5-point Likert scale, students were asked to rank the perceived seriousness of 25 cheating behaviors related to the physical and online classroom environments and to report how frequently they engaged in each of the behaviors. Fifteen of the cheating behaviors were comparable across both environments and an additional 5 behaviors specific to each environment were included. The study aimed to address the following research questions: (RQ1) Is there a difference between the perceived seriousness of academic cheating behaviors in the physical classroom compared to the online classroom? (RQ2) Do students with online experience rank cheating behaviors in the online environment as more serious than those students without online experience? (RQ3) Do students self-report higher levels of cheating online than in the physical classroom? (RQ4) Do students who perceive certain cheating behaviors as more serious forms of cheating, self-report less cheating of those behaviors? (RQ5) Is AI perceived as a more acceptable academic cheating behavior compared to other cheating behaviors? (RQ6) Are students self-reporting the use of AI as frequently as other cheating behaviors in the online and physical classrooms? For RQ1 a Wilcoxon signed rank test revealed that environment does matter with 6 out of 15 cheating behaviors being perceived to be more serious in the online environment and 1 behavior perceived to be more serious in the physical environment. For RQ2, a Mann-Whitney U test revealed that experience does matter with 14 out of 20 behaviors ranked as more unacceptable for students that had online experience. The Wilcoxon signed rank test showed that students were more likely to self-report cheating for 6 of the 15 behaviors in the physical environment so for RQ3 there is not evidence that students cheat more often online. Spearman's rank correlation was used to address RQ4 revealing that overall, students who rank behaviors as more extreme, self-report those behaviors less often. For RQ5 it was found that using AI for homework assignments was considered generally more acceptable than most other cheating behaviors and for RQ6, students were found to be reporting the usage of AI as frequently or more frequently compared to most other cheating behaviors.

Keywords: Artificial Intelligence in education, Online learning, Classroom, Academic cheating, Academic dishonesty

1. Introduction

The methods for delivering course content to undergraduate students has been evolving over the last couple of decades integrating more online learning into and in place of the traditional face-to-face learning environment. In 2005, 3.2 million higher education students in the United States were taking at least one online course (Allen and Seaman 2006). By 2016 this number had risen to 6.4 million (Seaman, Allen and Seaman, 2018) and by 2021, it had grown to 9.4 million which represents 61 percent of all undergraduate students in the U.S. (U.S. Department of Education, 2022).

The trend in online enrollment was starting to take shape in the early 2000's but was accelerated during the worldwide pandemic. The popularity of e-learning grew as schools, colleges, and universities started introducing online and blended learning methods while in-person education was unavailable. Similarly, during the pandemic, students had limited options for continuing in their traditional face-to-face courses and thus many had to adjust to the online learning environment with little or no prior experience with this method of instruction. As such, many online services that were available to students before the pandemic such as private tutoring and online companies offering homework assistance for a fee received a boost. As more students began navigating the online learning environment looking for resources to help them succeed, the existence of these resources became more widely accessible. Although post-Covid most higher education institutions transitioned back to face-to-face teaching, many colleges and universities perceived the adoption of e-learning as an opportunity for growth and began offering more online learning options than they did before or began new online programs to meet demand.

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While the benefits of online learning for college students are abundant (flexibility, convenience, cost-savings), there are many potential disadvantages as well. To be successful in the online environment, college students must be self-motivated, independent learners with good time management skills, traits not always highly developed by students during their high school years. In addition, a lack of student feedback and lower rates of interactions and engagement among the instructor and the student can lead to gaps in skill development especially in the area of communication which is essential for students when they enter the workforce (Sevnarayan, 2022; Noorbehbahani, Mohammadi and Aminazadeh, 2022.) Social isolation is also a concerning factor among students who choose online learning as it can lead to mental health issues stemming from stress and anxiety (Gibbons, Mize and Rogers, 2002; Lee and Aslam, 2023).

Finally, a major concern of online learning present both pre and post-Covid is the issue of academic dishonesty. Academic dishonesty is often used as a general term to refer to any fraudulent actions by a student to use unauthorized means in any academic work (Theart and Smit, 2012). Academic cheating on the other hand, is often used to describe specific behaviors and has been defined as 'any action taken before, during, or after the administration of a test or assignment, that is intended to gain an unfair advantage or produce inaccurate results,' (Cizek, 2012, p.16).

Extensive research has been conducted on academic cheating in both the face-to-face and online environments (Adzima, 2020). More recently, research has begun to explore how advances in Generative artificial intelligence (GenAI) impact academic integrity within the online environment suggesting rising levels of cheating using automated plagiarism and chatbots to complete assignments (Nguyen and Goto, 2024; Sholikhah *et al.,* 2023; Naidu and Sevnarayan, 2023) as well as a loss of academic integrity in online assessments (Susnjak, 2022; Humble et al., 2024).

Although there are many scholarly articles and studies focusing on academic dishonesty in the face-to-face and online environments, and an increasing number of articles beginning to examine the impact of integrating GenAI tools such as ChatGPT (Generative Pre-trained Transformer) in the classroom, there remains a gap in understanding what students consider to be acceptable behavior when it comes to using technology in different environments. This paper seeks to address this gap by (1) analyzing how students feel about the acceptability or severity of various cheating behaviors by comparing attitudes in the online versus traditional face-to-face environments and (2) examining self-reported cheating behaviors in these two environments. A subsequent and parallel goal in this paper is to analyze whether the newer types of cheating behaviors (those that make use of AI) are considered more acceptable and thus occur as, or more frequently compared to other more traditional cheating behaviors.

2. Literature Review

Academic dishonesty is not a new phenomenon. Concerns over academic misconduct can be found as early as the 1960's when the first large-scale survey from Columbia University in the United States revealed that issues such as cheating on exams and tests and plagiarizing on papers and assignments was perceived to be a problem by academic deans and student body presidents (Bowers, 1964). The study also revealed that three-fourths of the 5,000 respondents in the study had engaged in one or more acts of academic dishonesty (Mcabe and Trevino, 2001). From the 1960s to the 1990s much of the literature on academic dishonesty focused on individual factors such as gender, age, grade point average, and work ethic and a few studies included contextual factors such as honor codes, faculty responses to cheating and social learning (McCabe and Trevino, 2001).

With advances in technology and Internet usage becoming more commonplace in the early 2000's, there were many claims and expectations that the level of academic dishonesty was going to rise (McCabe 2001). Ali, Sultan and Aboelmaged (2021) performed a bibliometric analysis revealing that between 2000-2020 there was substantial growth in research pertaining to academic misconduct. Their findings found a cluster of keywords revealing four major themes being addressed during this timeframe related to the issues addressed in this paper. The first theme revealed that plagiarism was the most common keyword with many articles focusing on plagiarism policies and perceptions. For instance, research showed that many students found plagiarism policies difficult to understand (Gullifer and Tyson, 2014; Leonard *et al.,* 2015; Palmer, Pegrum and Oakley, 2019) with new undergraduate students having more difficulty than postgraduate students (Newton, 2016). A more recent review of the literature found that the most common reasons for committing plagiarism are easy access to electronic resources, being unaware of the instructions, a busy schedule, an abundance of homework and laziness (Kampa *et al.,* 2025). Finally, a new term has emerged in this area of research that combines AI and

plagiarism known as "AI-giarism." This new terminology encompasses unethical practices using AI technologies to generate content without appropriate citation (Chan 2025). A study by Chan (2025) finds that students are not as well informed about what constitutes the misuse of AI tools in academic writing (AI-giarism) compared to more traditional forms of plagiarism.

The second theme discussed by Ali, Sultan and Aboelmaged (2021) and found to be prevalent in the research from 2000-2020, is referred to as contract cheating which occurs when students submit work that has been completed by someone else. Within this theme, various topics are discussed such as the key facilitators of contracting like higher access to the Internet, social media or other website resources (Trushell, Byrne, and Simpson, 2012; Rowland *et al.,* 2018). Additional research in this area focused on the environment with findings that online students are more apt to engage in this type of academic misconduct than residential students (Lancaster and Clark, 2014).

The third important theme in the review dealt with academic misconduct in online education. These studies compare misconduct between online and face-to-face students and suggest strategies to mitigate cheating. Although there are many studies that reveal both faculty (Guyette, King and Piotrowski, 2008; Rogers, 2006; Kennedy *et al.,* 2000; Patnaude, 2008) and students (Dillé, 2011; Kennedy *et al.*, 2000; King, Guyette and Piotrowski, 2009; Miller and Young-Jones, 2012; Watson and Sottile, 2010) perceive online testing to offer more cheating opportunities than in face-to-face, proctored learning environments, research that compares actual cheating behaviors between the online and traditional classrooms offers mixed results.

For example, Gullifer and Tyson (2014), Peled (2019), Hart and Morgan (2010), Kidwell and Kent (2008), Stuber-McEwan, Wisely and Hoggatt (2009), Miller and Young-Jones (2012) report less incidents of online cheating, while others find more incidents of cheating in the online classroom (Lanier, 2006; Goff, Johnston, and Bouboulis, 2020; Arnold, 2016; Fendler, Beard and Godbey, 2021). There are also studies that find the levels of cheating to be comparable between online and traditional face-to-face courses (Grijalwa, Nowell and Kerkvliet, 2006; Watson and Scottie, 2010). The strategies suggested to reduce cheating in online education include formulating strong regulations and confirming students' identity, the use of web proctoring technology, and advanced software to detect and prevent instances of academic dishonesty (McGee, 2013; Hylton, Levy, and Dringus, 2016; Tsai, 2016).

The fourth theme emerging as an important topic during this timeframe is academic collusion. This theme received relatively less attention compared to the first three themes but remains a critical issue within the academic dishonesty literature. Academic collusion most commonly occurs when students work together on an assignment or exam without permission from their instructor. Research has found increasing incidents of academic collusion (Kim and LaBianca 2018; Newton 2016). According to Barrett and Cox (2005) and Taylor, Glaister, and Sutton (2007) reasons for this trend could be attributed to confusion amongst students when distinguishing between legitimate collaboration and collusion.

Another important topic or theme related to academic dishonesty (not directly specified in the themes mentioned above) are the contextual factors such as student perceptions of cheating, peer behavior, perceived opportunities, classroom environment, and faculty actions that play a significant role in developing student attitudes and beliefs about academic dishonesty. Research has shown that "peers' cheating behavior, peers' disapproval of cheating, a student's perception of the culture of academic integrity on campus, and the perceived severity of penalties of cheating" are related to students' reported academic misconduct (McCabe, Butterfield, and Trevino, 2012, p. 113).

Similarly, according to Chala (2021), differences in socio cultural settings, demographic composition and educational policies and programs influence students' beliefs or attitudes about the severity of various cheating behaviors and these beliefs affect both the frequency and likelihood of the behavior. For example, if students believe that looking at an exam that someone kept from a previous semester is trivial cheating, then it is likely that this behavior will occur more often. More generally, studies have shown that students who have a favorable attitude toward academic misconduct display higher levels of cheating behaviors (Elias and Farag, 2010; Lee *et al.,* 2017; Yu *et al.,* 2018; Renata *et al*., 2024). Dyer, Pettyjohn and Saladin, (2020) hypothesized that there would not be a difference in student attitudes regarding the acceptability of cheating behaviors in unproctored versus proctored settings but found that students considered cheating as being more acceptable on an unproctored test than on a proctored test. Overall, these findings suggest that investigating student beliefs about the severity of cheating behaviors in both the physical and online environments is of particular importance as technological advancements, specifically in AI, continue to offer new ways and opportunities for students to engage in academic dishonesty.

3. Methodology

3.1 Research Problem

Despite the increasing number of scholarly articles and studies examining online cheating behaviors and the use of AI in the college classroom, there is still a lack of research that examines student beliefs about the seriousness or acceptability of those behaviors in different environments. Furthermore, given the rapid advancement of technologies, studies that examine self-reported cheating behaviors involving AI are still in their infancy.

3.2 Research Objective

This study compares students' beliefs about the seriousness of cheating behaviors in the physical and online environment and analyzes how these beliefs relate to self-reported cheating behaviors. Specific emphasis is placed on cheating behaviors related to AI.

3.3 Research Questions

To address the research objectives, this study examines the following six research questions:

RQ1: Is there a difference between the perceived seriousness of academic cheating behaviors in the physical classroom compared to the online classroom?

RQ2: Do students with online experience rank cheating behaviors in the online environment as more serious than those students without online experience?

RQ3: Do students self-report higher levels of cheating online than in the physical classroom?

RQ4: Do students who perceive certain cheating behaviors as more serious forms of cheating, self-report less cheating of those behaviors?

RQ5: Is AI perceived as a more acceptable academic cheating behavior compared to other cheating behaviors?

RQ6: Are students self-reporting the use of AI as frequently as other cheating behaviors in the online and physical classrooms?

3.4 Materials and Methods

This research employed quantitative research design, utilizing an online survey as the primary data collection instrument. The author developed and distributed the survey using Qualtrics. The survey was administered at a small suburban four-year college to undergraduate students in the United States taking business courses during the 2024-25 academic year. Participants used a hyperlink that was supplied by their instructor or made available to them at a student lab. Participants were made aware that the surveys would remain anonymous, and that any identifying information would not be used to match student answers for any purpose. Students were offered extra credit for completing the survey as determined by their individual instructors.

Data were collected from 328 students, however, response rates varied somewhat by question. Sixty-three percent of the participants were freshman, 22 percent were sophomores, 8 percent were juniors and 7 percent were seniors. Approximately 63 percent of participants had declared (or intended to declare) a traditional business major (finance, marketing, economics, etc.), with the remaining participants majoring in (or planning to major in) fields from other schools within the college such as engineering, humanities, and science. Variation in the age of the students was limited, with 90.5 percent being between the ages of 18-21, 8.0 percent being between 22-25 and 1.5 percent being over 25. Female respondents made up approximately 31 percent of the survey population, and approximately 44 percent of participants had taken both online and traditional face-to-face courses.

The survey was designed to build upon existing research and address gaps in the literature related to new forms of academic cheating such as the use of AI. Questions for this survey were adopted from other studies investigating the perceived seriousness of cheating behaviors and the perceptions of cheating online versus the traditional classroom (Oneill and Pfeifer, 2012; Witherspoon et al., 2012; Chala, 2021; Miller and Young-Jones, 2012). The author piloted the questions pertaining to AI. The first section of the survey introduced Likert scale questions regarding student beliefs about the acceptability of the described cheating behaviors (rated in five scale, i.e. 1=Not at all ….. 5 = Extremely). Participants were asked to rank the severity of 25 behaviors from the perspective of both the physical and online learning environments. Fifteen of the behaviors were common among both environments. The second set of questions dealt with how frequently the students had engaged in those same set of cheating behaviors in both the face-to-face classroom and the online classroom also formatted

as Likert scale (with 1 = Never ….. 5 = Always). Only participants who had taken online courses answered the online cheating behavior frequency questions.

3.5 Results

The purpose of the first two research questions, (R1 and R2) is to assess the perceived seriousness of academic cheating behaviors among undergraduates and look for differences in the rankings between the face-to-face and online classroom environments as well as possible differences between student beliefs for those with and without online experience.

Students ranked the severity of behaviors 1-15 (B1-B15) for both environments. Students ranked behaviors 16-20 for only the physical environment and behaviors 21-25 for only the online classroom. The behaviors from the survey are listed in the first column of Table 1 (and all subsequent tables). A Wilcoxon signed rank test was conducted to compare the reported level of seriousness for cheating between the physical classroom and the online classroom for the first 15 behaviors listed. Table 1 gives the z-value in column three which determines if the null of "no difference between the paired observations" can be rejected. Seven of the listed behaviors (B1, B6, B8, B10, B11, B12, B14) were significantly different at the five percent level (denoted with ** in the tables) when comparing the median of the differences between the two environments. Behavior 1 was perceived to be more serious in the physical environment and the remaining six behaviors were perceived to be more serious in the online environment. The absolute value of effect size (Pearson's r) is listed in the third column for the seven statistically significant behaviors. According to Cohen (1988) an $r < 0.10$ has little effect, an r between 0.1 and 0.3 has a small effect, an r greater than 0.3 but less than 0.5 has a medium effect, and an r greater than 0.5 has a large effect. B6 (falsifying reasons for missing an exam) and B11 (working on a take home exam with others without permission) both had a medium effect, while the other behaviors B1, B8, B10, B12, and B14 were found to have a small effect (column four).

To analyze whether students with and without online experience have different beliefs about the severity of cheating behaviors in the online environment, a Mann-Whitney U test was conducted to determine if there is a difference in the median rankings for behaviors B1-B15 and B21-B25. As reported in the fourth column of Table 1, 14 of the 20 behaviors (B1, B2, B4, B5, B6, B7, B9, B10, B11, B12, B13, B23, B24, B25) were found to be significantly different. More specifically, all 14 behaviors were ranked as more unacceptable for those students who had online experience, although in all cases, the effect size was determined to be small (columns six and seven).

Table 1: Differences in Cheating Behaviors in the Physical and Online Classrooms and Between Students with and without Online Experience

Behaviors Physical and Online Classrooms	Obs	Wilcoxon signed rank z-value	Effect size (r)	Obs	Mann-Whitney z-value	Effect size (r)
B1: Copying a classmate's answers while taking an exam	328	1.93**	0.11	321	-3.79**	0.21
B2: Permitting others to use my exam answers	325	0.41		319	-2.25**	0.13
B3: Using an old exam to study while knowing it hasn't been made available to others	327	0.01		320	-1.58	
B4: Letting someone else complete an assignment for you and taking credit	323	-1.34		316	-2.46**	0.14
B5: Not participating in a group assignment and taking credit	323	-0.81		317	-2.77**	0.16
B6: Falsifying reasons for missing an exam	327	-6.55**	0.36	320	-2.78**	0.16
B7: Letting someone else write a paper for you	322	-0.55		318	-2.39**	0.13
B8: Buying a paper or assignment from an online source	325	-2.57**	0.14	320	-1.81	
B9: Paraphrasing/copying a few sentences from an electronic source without referencing	323	-1.03		318	-2.02**	0.11
B10: Working on an assignment with others when asked to work individually	325	-2.69**	0.15	319	-3.61**	0.20

Behaviors Physical and Online Classrooms	Obs	Wilcoxon signed rank z-value	Effect size (r)	Obs	Mann-Whitney z-value	Effect size (r)
B11: Working on a take home exam with others when asked to work individually	320	-7.57**	0.42	314	-2.37**	0.13
B12: Using any advantage to improve your grade that is not available to everyone	320	-4.52**	0.25	316	-2.34**	0.13
B13: Breaking a rule that was explicitly mentioned in the syllabus	324	-1.04		319	-2.12**	0.12
B14: Using artificial intelligence software to complete a homework assignment	288	-2.50**	0.15	283	-1.25	
B15: Using artificial intelligence to write a paper	290	-1.05		284	-0.45	
B16: Writing notes on your hand or other area of the body						
B17: Using a cell phone to look up an answer while taking an exam						
B18: Asking a friend who has taken the exam previously about the questions						
B19: Using your notes to look up an answer when the teacher isn't looking						
B20: Texting exam answers to friends during an exam						
B21: Looking up answers to an online homework assignment from another Internet source				316	-1.75	
B22: Looking up answers to an online exam from another Internet source				319	-1.55	
B23: Buying exam answers from an online site or person				318	-2.85**	0.16
B24: Letting a friend or other person take an exam for you				319	-3.35**	0.19
B25: Using screen sharing software such as Zoom, Google Meet, collaborate with others while taking an online exam				317	-2.78**	0.16

Notes: Obs = Observations, Pearson correlation coefficient is labeled as "r"

For discussion purposes, Table 2 presents the students' attitudes toward the level of cheating as percentages for each of the 15 comparable behavior categories and Table 3 presents the percentages for the separate behaviors relevant to only one type of learning environment. Analyzing the percentages provides a summary for each learning environment and helps to better evaluate how students rank the severity of different behaviors based on their online experience.

Table 2 reveals that B1, "copying a classmate's answers while taking an exam" and B7, "letting someone else write a paper for you" were the two highest ranked cheating behaviors from both the physical and online perspectives. B1 ranged from 52 to 71 percent of students choosing the extremely serious category, and B7 ranged from 56 to 67 percent of students choosing the extremely serious category. When examining the "not at all" serious choice category, B10, "working on an assignment when asked to work individually" and B5, "not participating in a group assignment and taking credit," were the behaviors found to be most trivial in the physical environment. B12, "using any advantage to improve your grade that is not available to others" and B3, "using an old exam to study," were considered the least serious cheating behaviors in the online environments. For B12, between 15 -26 percent of students found this behavior to be "not at all" serious and for B3, the range was 11 to 17 percent.

In Table 3, the two behaviors perceived to be the most severe for the physical classroom are B17, "using a cell phone to look up answers while taking an exam" and B20 "texting answers to a friend during exam," with 76 percent and 68 percent of students rating those behaviors as extreme forms of cheating. For the online only

behaviors, B24, "letting a friend take an exam for you" was ranked the most severe at 67 percent, followed by B23, "buying exam answers from an online site or person," at about 58 percent for students with and without online experience. When comparing those students with online experience to those students who have not taken an online course, it is worth noting that all five behaviors (B21-B25) received a higher percentage of "extremely serious" rankings from those with online experience and all five behaviors received a higher percentage of "not at all" serious from the students without online experience. Specifically, 16 percent of students without online experience claimed that looking up homework answers on the Internet is not at all serious and 10 percent claimed that looking up exam answers is not at all serious. For students with online experience, these numbers were about eight and three percent respectively.

To examine the third research question (R3) "do students self-report higher levels of cheating behaviors online than in the physical classroom?" data for the 15 similar behaviors between online cheating and physical face-to-face cheating were examined for those students who had experience in the online classroom. Table 4 (column three) displays the results of the Wilcoxon signed rank test which shows that there was a significant difference in the medians for six of the behaviors (B1, B3, B6, B8, B10, and B12) implying that students were statistically more likely to self-report cheating behaviors in the physical classroom for these six items. B6 (falsifying reasons for missing an exam) showed a medium effect size when calculating the rank correlation, (z-value/ square root of observations) while the other behaviors revealed a small effect as displayed in column four of Table 4.

Table 2: Ranked Cheating Behaviors as Percentages

Behaviors Physical and Online Classrooms	Physical Extreme	Online All Extreme	Online Experience Extreme	Online No Experience Extreme	Physical Very	Online All Very	Online Experience Very	Online No Experience Very
B1: Copying a classmate's answers while taking an exam	64.94	60.06	70.92	51.67	19.51	22.87	19.15	26.67
B2: Permitting others to use my exam answers	57.80	54.60	60.00	50.84	20.49	26.69	28.57	25.70
B3: Using an old exam to study while knowing it hasn't been made available	21.95	23.55	24.29	23.33	17.68	18.04	20.71	16.11
B4: Letting someone else complete an assignment for you and taking credit	52.44	54.18	62.04	49.72	21.95	20.43	18.98	21.23
B5: Not participating in a group assignment and taking credit	35.17	38.89	43.48	35.75	27.52	22.22	4.32	19.55
B6: Falsifying reasons for missing an exam	19.57	30.89	37.14	26.67	21.41	22.02	23.57	21.11
B7: Letting someone else write a paper for you	58.46	60.31	66.91	55.87	21.23	20.31	20.14	20.67
B8: Buying a paper or assignment from an online source	49.08	55.05	60.71	51.67	22.39	21.41	20.00	23.33
B9: Paraphrasing/copying a few sentences without referencing	27.69	30.77	35.25	28.49	24.00	24.00	25.18	22.91
B10: Working on an assignment with others when asked to work individually	19.02	20.25	28.78	14.44	17.18	22.09	21.58	21.67

Behaviors Physical and Online Classrooms	Physical Extreme	Online All Extreme	Online Experience Extreme	Online No Experience Extreme	Physical Very	Online All Very	Online Experience Very	Online No Experience Very
B11: Working on a take home exam with others when asked to work individually	23.31	38.01	42.22	34.64	24.23	25.86	29.63	23.46
B12: Using any advantage to improve your grade that is not available to everyone	16.05	21.98	29.20	16.20	21.30	20.12	18.98	21.79
B13: Breaking a rule that was explicitly mentioned in the syllabus	41.23	44.48	51.08	41.11	27.69	25.46	24.46	26.67
B14: Using artificial intelligence software to complete a homework assignment	24.83	30.00	32.76	29.34	22.07	16.90	20.69	14.97
B15: Using artificial intelligence to write a paper	40.55	40.89	43.59	40.12	22.34	24.40	22.22	25.15

Table 2: Ranked Cheating Behaviors as Percentages (continued)

Behaviors Physical and Online Classrooms	Physical Somewhat	Online All Somewhat	Online Experience Somewhat	Online No Experience Somewhat	Physical Slightly	Online All Slightly	Online Experience Slightly	Online No Experience Slightly
B1: Copying a classmate's answers while taking an exam	5.18	9.15	8.51	10.00	2.13	3.05	0.71	4.44
B2: Permitting others to use my exam answers	9.79	8.59	5.71	10.61	3.67	5.52	4.29	6.70
B3: Using an old exam to study while knowing it hasn't been made available	29.57	26.30	29.29	24.44	13.41	14.98	14.29	15.56
B4: Letting someone else complete an assignment for you and taking credit	12.20	16.41	13.87	18.44	4.57	4.33	4.38	3.91
B5: Not participating in a group assignment and taking credit	18.35	21.30	6.47	20.67	8.87	11.42	0.00	16.20
B6: Falsifying reasons for missing an exam	27.52	25.99	25.00	26.67	15.90	11.62	9.29	13.33
B7: Letting someone else write a paper for you	9.23	10.46	8.63	11.73	2.15	3.38	2.16	4.47
B8: Buying a paper or assignment from an online source	12.88	13.76	13.57	12.78	6.13	4.28	3.57	5.00
B9: Paraphrasing/copying a few sentences without referencing	26.15	22.46	22.30	22.91	12.00	15.08	14.39	15.08
B10: Working on an assignment with others when asked to work individually	31.29	30.06	31.65	30.00	21.17	17.79	12.23	21.67
B11: Working on a take home exam with others when asked to work individually	25.15	19.00	17.78	20.67	15.34	9.03	5.19	11.17

Behaviors Physical and Online Classrooms	Physical Somewhat	Online All Somewhat	Online Experience Somewhat	Online No Experience Somewhat	Physical Slightly	Online All Slightly	Online Experience Slightly	Online No Experience Slightly
B12: Using any advantage to improve your grade that is not available to everyone	23.15	25.39	24.09	26.82	13.27	13.31	12.41	13.97
B13: Breaking a rule that was explicitly mentioned in the syllabus	17.85	17.18	17.27	16.11	6.46	7.98	5.04	10.00
B14: Using artificial intelligence software to complete a homework assignment	21.72	26.90	24.14	28.74	16.90	13.45	12.07	12.57
B15: Using artificial intelligence to write a paper	19.59	19.24	18.80	20.36	7.90	6.87	10.26	4.19

Table 2: Ranked Cheating Behaviors as Percentages (Continued)

Behaviors Physical and Online Classrooms	Physical Not at all	Online All Not at all	Online Experience	Online No Experience
B1: Copying a classmate's answers while taking an exam	8.23	4.88	0.71	7.22
B2: Permitting others to use my exam answers	8.26	4.60	1.43	6.15
B3: Using an old exam to study while knowing it hasn't been made available	17.38	17.13	11.43	20.56
B4: Letting someone else complete an assignment for you and taking credit	8.84	4.64	0.73	6.70
B5: Not participating in a group assignment and taking credit	10.09	6.17	0.72	7.82
B6: Falsifying reasons for missing an exam	15.60	9.48	5.00	12.22
B7: Letting someone else write a paper for you	8.92	5.54	2.16	7.26
B8: Buying a paper or assignment from an online source	9.51	5.50	2.14	7.22
B9: Paraphrasing/copying a few sentences without referencing	10.15	7.69	2.88	10.61
B10: Working on an assignment with others when asked to work individually	11.35	9.82	5.76	12.22
B11: Working on a take home exam with others when asked to work individually	11.96	8.10	5.19	10.06
B12: Using any advantage to improve your grade that is not available to everyone	26.23	19.20	15.33	21.23
B13: Breaking a rule that was explicitly mentioned in the syllabus	6.77	4.91	2.16	6.11
B14: Using artificial intelligence software to complete a homework assignment	14.48	12.76	10.34	14.37
B15: Using artificial intelligence to write a paper	9.62	8.59	5.13	10.18

Table 3: Cheating Behaviors Ranked by Environment

Behaviors Physical Classroom Only	Physical Obs	Extreme	Very	Somewhat	Slightly	Not at all
Writing notes on your hand or other area of the body	328	55.18	23.48	9.45	4.27	7.62
Using a cell phone to look up an answer while taking an exam	325	76.00	11.69	3.69	1.23	7.38
Asking a friend who has taken the exam previously about the questions	327	11.31	13.15	27.83	23.55	24.16
Using your notes to look up an answer when the teacher isn't looking	327	53.52	26.91	9.48	1.83	8.26

Behaviors Physical Classroom Only	Physical Obs	Extreme	Very	Somewhat	Slightly	Not at all
Texting exam answers to friends during an exam	324	67.90	18.21	4.94	0.93	8.02
Not participating in a group assignment and taking credit	327	35.17	27.52	18.35	8.87	10.09
Behaviors Online Classroom Only (all observations)	**Online All Obs**	**Extreme**	**Very**	**Somewhat**	**Slightly**	**Not at all**
Looking up answers to a homework assignment from another Internet source	323	24.46	21.67	25.39	15.79	12.69
Looking up answers to an online exam from another Internet source	326	48.77	26.69	12.88	4.60	7.06
Buying exam answers from an online site or person	325	57.54	21.85	9.54	6.15	4.92
Letting a friend or other person take an exam for you	326	67.18	17.48	6.13	4.29	4.91
Using screen sharing software such as Zoom, Google Meet, or others to collaborate with others while taking an online exam	324	50.31	23.46	14.81	5.25	6.17
Behaviors Online Classroom Only (with online experience)	**Online Experience Obs**	**Extreme**	**Very**	**Somewhat**	**Slightly**	**Not at all**
Looking up answers to a homework assignment from another Internet source	138	27.54	23.19	26.81	14.49	7.97
Looking up answers to an online exam from another Internet source	139	50.36	32.37	12.23	2.16	2.88
Buying exam answers from an online site or person	138	64.49	23.91	6.52	3.62	1.45
Letting a friend or other person take an exam for you	139	76.98	13.67	5.76	1.44	2.16
Using screen sharing software such as Zoom, Google Meet, or others to collaborate with others while taking an online exam	137	57.66	23.36	14.60	1.46	2.92
Behaviors Online Classroom Only (with no online experience)	**No Online Experience Obs**	**Extreme**	**Very**	**Somewhat**	**Slightly**	**Not at all**
Looking up answers to a homework assignment from another Internet source	178	23.03	20.79	24.72	15.73	15.73
Looking up answers to an online exam from another Internet source	180	47.78	22.78	13.89	6.11	9.44
Buying exam answers from an online site or person	180	52.22	21.11	12.22	7.78	6.67
Letting a friend or other person take an exam for you	180	60.00	20.56	6.67	6.67	6.11
Using screen sharing software such as Zoom, Google Meet, or others to collaborate with others while taking an online exam	180	45.00	23.89	15.56	7.78	7.78

Notes: Obs = Observations, column headings are Likert scale anchors

Table 4: Frequency of Cheating Online versus the Physical Classroom and Percentage of Students who have Admitted to Cheating at Least Once

Behaviors Physical and Online Classrooms	Obs	z-value	Rank (r)	Obs Physical	Physical Cheating percent	Obs Online	Online Cheating percent
B1: Copying a classmate's answers while taking an exam	139	2.93**	0.25	320	23.13	139	12.23
B2: Permitting others to use my exam answers	138	0.60		317	19.56	139	17.27
B3: Using an old exam to study while knowing it hasn't been made available	139	3.47**	0.29	319	26.96	139	22.30
B4: Letting someone else complete an assignment for you and taking credit	137	0.55		318	11.95	139	9.35
B5: Not participating in a group assignment and taking credit	139	0.48		319	14.42	139	11.51
B6: Falsifying reasons for missing an exam	139	3.83**	0.32	320	18.75	139	9.35
B7: Letting someone else write a paper for you	139	0.40		320	7.19	139	6.47
B8: Buying a paper or assignment from an online source	139	2.10**	0.18	320	8.13	139	3.60
B9: Paraphrasing/copying a few sentences without referencing	136	0.38		318	39.94	138	42.03
B10: Working on an assignment with others when asked to work individually	139	2.18**	0.18	319	45.45	139	38.85
B11: Working on a take home exam with others when asked to work individually	138	1.05		320	26.25	138	25.36
B12: Using any advantage to improve your grade that is not available to everyone	138	2.57**	0.22	318	30.19	139	31.65
B13: Breaking a rule that was explicitly mentioned in the syllabus	138	0.02		318	24.21	139	30.94
B14: Using artificial intelligence software to complete a homework assignment	115	1.30		281	52.31	116	57.76
B15: Using artificial intelligence to write a paper	102	0.94		250	28.40	139	33.09
B16: Writing notes on your hand or other area of the body				320	17.81		
B17: Using a cell phone to look up an answer while taking an exam				319	14.42		
B18: Asking a friend who has taken the exam previously about the questions				320	56.56		
B19: Using your notes to look up an answer when the teacher isn't looking				320	11.88		
B20: Texting exam answers to friends during an exam				318	7.55		
B21: Looking up answers to an online homework assignment from another Internet source							51.08
B22: Looking up answers to an online exam from another Internet source							32.61
B23: Buying exam answers from an online site or person							4.32
B24: Letting a friend or other person take an exam for you							3.60
B25: Using screen sharing software such as Zoom, Google Meet, collaborate with others while taking an online exam							7.19

Notes: Obs = Observations, r = Spearman's rank correlation (rho)

Columns six and eight in Table 4 also displays the percentage of students who admitted to cheating at least once for each of the 15 similar behaviors and for the behaviors specific to each environment. For eleven of the behaviors, the percentage of students admitting to cheating at least once was greater for the physical classroom. Two of the behaviors had the same percentage of self-reported cheating (B9, B13), and the last two behaviors, B14 and B15 (which deal with the use of AI for homework and writing papers) were greater for the online environment.

For behaviors (B16-B20) that were only asked for the physical classroom, B18 (asking a friend who has taken the exam previously about the questions) was the highest self-reported cheating behavior at 57 percent, with the next highest, B16 (writing notes on your hand) at 18 percent. For behaviors (B21-B25) that were only asked for the online environment, B21 (looking up answers to a homework assignment from an Internet source) and B22 (looking up exam answers from an Internet source) were the two highest self-reported cheating behaviors with 49 percent of students admitting to doing B21 at least once and 31 percent admitting to doing B22 at least once.

To examine the fourth research question, "do students who perceive certain cheating behaviors as more serious forms of cheating, self-report less cheating of those behaviors?" (R4), Spearman's rank correlation (rho) is used for each of the cheating behaviors. Table 5 displays the results for each behavior and the associated p-value. Column three in the table displays the correlation between the acceptability of cheating and actual cheating in the physical classroom and column five displays the correlation between the acceptability of cheating and actual cheating in the online classroom. For the physical classroom, all but one behavior (B4) shows a statistically significant negative correlation between the acceptability of the behavior and the actual behavior. This implies that most students who rank a cheating behavior higher are less likely to self-report engaging in that behavior. The strength of the relationship between most of the beliefs and self-reported behaviors is considered "weak" with coefficients less than 0.30. However, two behaviors, B14 (paraphrasing without citation) and B20 (using AI for homework) have a medium relationship. For the online classroom, all but three behaviors (B1, B3, and B5) show a statistically significant negative correlation between beliefs and self-reported behavior. In this case all but four behaviors are considered weak relationships. The four that have medium effect relationships are B11(letting someone else complete an assignment for you), B12 (paraphrasing without citation), B16 (using screen-sharing to collaborate on exams), and B20 (breaking a rule not mentioned in the syllabus). Overall, given the results of both the physical and online correlation tests, most students who rank behaviors as more extreme, self-report those behaviors less often.

To examine the last two research questions "is generative AI perceived as a more serious academic cheating behavior compared to others? (R5) and "are students self-reporting the use of AI as frequently as other cheating behaviors in the online and physical classrooms?" (R6), it is useful to look back at Tables 2 and 4. In Table 2, "using artificial intelligence software to complete a homework assignment" was ranked as extremely serious by 25 percent of students for the physical classroom, 33 percent for the online classroom for students with online experience, and 29 percent for students without online experience. When combining the "extremely" and "very" serious categories the percentage increases to 47 percent for the physical classroom and 53 percent (online experience) and 44 percent (no online experience) for the online classroom. For the second AI question, "Using artificial intelligence to write a paper" the ranking for extremely serious was 41 percent for the physical classroom, 44 percent for the online classroom for students with online experience, and 40 percent for students without online experience. When combining the "extremely" and "very" serious categories the percentages are 63 percent for the physical classroom and 66 percent (online experience) and 65 percent (no online experience) for the online classroom.

To examine the last research question, (R6), Table 4 shows that 28 percent of students in the physical classroom self-reported using AI to write a paper at least once and 52 percent self-reported using AI to complete their homework at least once. For the online classroom, 33 percent self-reported using AI to write a paper and 58 percent self-reported using AI for homework at least once. Using AI to complete a homework assignment was the highest self-reported behavior that students admitted to doing at least once in both learning environments.

Table 5: Comparing Cheating Beliefs to Frequency of Cheating

Behaviors Physical and Online Classrooms	Physical Obs	Rank (r)	Online Obs	Rank (r)
B1: Copying a classmate's answers while taking an exam	321	-0.16**	139	-0.03
B2: Permitting others to use my exam answers	317	-0.12**	138	-0.24**

Behaviors Physical and Online Classrooms	Physical Obs	Rank (r)	Online Obs	Rank (r)
B3: Using an old exam to study while knowing it hasn't been made available	320	-0.22**	138	0.01**
B4: Letting someone else complete an assignment for you and taking credit	319	-0.20**	136	-0.33**
B5: Not participating in a group assignment and taking credit	319	-0.15**	137	-0.21**
B6: Falsifying reasons for missing an exam	320	-0.13**	138	-0.12
B7: Letting someone else write a paper for you	318	-0.20**	138	-0.28**
B8: Buying a paper or assignment from an online source	319	-0.16**	138	-0.10
B9: Paraphrasing/copying a few sentences without referencing	317	-0.36**	137	-0.47**
B10: Working on an assignment with others when asked to work individually	319	-0.26**	138	-0.23**
B11: Working on a take home exam with others when asked to work individually	320	-0.25**	133	-0.25**
B12: Using any advantage to improve your grade that is not available to everyone	316	-0.26**	136	-0.30**
B13: Breaking a rule that was explicitly mentioned in the syllabus	317	-0.27**	138	-0.38**
B14: Using artificial intelligence software to complete a homework assignment	279	-0.33**	114	-0.24**
B15: Using artificial intelligence to write a paper	249	-0.25**	116	-0.24**
B16: Writing notes on your hand or other area of the body	321	-0.22**		
B17: Using a cell phone to look up an answer while taking an exam	317	-0.12**		
B18: Asking a friend who has taken the exam previously about the questions	321	-0.24**		
B19: Using your notes to look up an answer when the teacher isn't looking	320	-0.21**		
B20: Texting exam answers to friends during an exam	315	-0.21**		
B21: Looking up answers to an online homework assignment from another Internet source			137	-0.21**
B22: Looking up answers to an online exam from another Internet source			137	-0.19**
B23: Buying exam answers from an online site or person			137	-0.25**
B24: Letting a friend or other person take an exam for you			138	-0.29**
B25: Using screen sharing software such as Zoom, Google Meet, collaborate with others while taking an online exam			136	-0.34**

Notes: Obs = Observations, r = Spearman's rank correlation (rho)

3.6 Discussion

The current study was designed to examine several research questions comparing student attitudes towards academic cheating behaviors and the frequency of cheating behaviors in the physical and online environments. Understanding how students feel about the severity of cheating behaviors in these two environments and examining the self-reported behaviors provides a framework for faculty and administrators as they continue to try and address the prevalence of academic cheating at their institutions.

For the first research question, the results showed that students perceive six of the behaviors to be more unacceptable in the online environment compared to the physical environment. Two of those behaviors deal with collaboration which is consistent with previous findings showing how the absence of a close relationship and interaction with an instructor can encourage unauthorized group work (Sendag, Duran and Fraser, 2012; McGee, 2013; Hearn Moore, Head, and Griffin, 2017). Students may find these behaviors more unacceptable because they suspect it is harder to get caught in the online setting (King, Guyette, and Piotrowski, 2009; Walsh *et al.,* 2021). The finding that not all cheating behaviors are considered equally unacceptable in

both environments is worth additional consideration and further research. The reasons "why" students view cheating behaviors differently depending on the environment is an important question with limited coverage. Only one paper was found to address this issue citing a lack of proctoring, extenuating circumstances (pandemic), and cheating influences (Walsh *et al*., 2021). Additional research in this area is needed to gain perspective on how these beliefs are formed. Answers to these questions could help teachers and administrators develop strategies to ensure that all cheating behaviors are deemed unacceptable regardless of the learning environment.

Table 1 results address (RQ2) revealing that students with online experience tended to rank cheating behaviors as more unacceptable overall. In addition, for three of the five behaviors that were specific to online cheating opportunities (B23, B24, B25), the Mann-Whitney test revealed that students with online experience ranked them as more serious as well. This finding suggests that once students have online experience they may better understand or gain perspective as to why cheating behaviors in the online environment are just as unacceptable and thus will not perpetuate the idea that cheating is an accepted or expected behavior in this environment. Students with online experience may also better understand how online cheating can be detected through proctoring tools and other technologies.

The third research question (RQ3) asked if self-reported cheating behaviors online were more frequent than the physical classroom. When comparing median values, there were six behaviors for which students reported more cheating in the physical classroom and in all but three behaviors the percentage of students who self-reported cheating at least once was higher for the physical classroom (two of the behaviors reported the same number). This finding contrasts with studies such as Lanier (2006), Fendler, Beard and Godbey (2024) and Miller and Young-Jones (2012), who have found higher rates of cheating being reported in the online environment. However, the percentage of students self-reporting cheating at least once in the online environment for behaviors such as "looking up answers to an online homework assignment from another Internet source," and "looking up answers to an online exam from another Internet source," were still quite high at 51 percent and 33 percent respectively. These percentages are significant findings for faculty who are designing online courses since homework measures how well students understand course material, and exams are usually the main determinant for assessing if learning objectives are being met. These results also suggest that more advanced forms of proctoring such as monitoring students through webcams and using LockDown Browser are necessary to ensure that students are fairly assessed and that students are learning the material.

The fourth research question (RQ4) asked if students self-report less cheating for behaviors they deem more serious. The results from this survey provide evidence that this is true. Students who consider certain behaviors to be more unacceptable are less likely to self-report engaging in those behaviors in both the physical and online environments. This finding is consistent with previous studies such Dyer, Pettyjohn and Saladin, (2020) and Mensah, Azila-Gbettor and Appietu, (2016) whose results reveal both small and modest correlations between students' beliefs and their likelihood of engaging in cheating behaviors especially for proctored examinations. These results underscore the importance of studying student beliefs to better understand how to combat various forms of cheating. Determining why certain behaviors get labeled as "trivial" by students, will help faculty and administrators develop strategies that ensure all cheating behaviors are understood to be unacceptable.

Finally, the last two research questions focus on ranking the seriousness of AI as a cheating behavior and the frequency with which students are using it. To answer the research question (RQ5), "is AI perceived as a more acceptable compared to other cheating behaviors," the data from Table 2 can be further examined. Roughly 27 percent of students (when averaging across the two environments) consider using AI to complete a homework assignment to be an extremely serious form of cheating. This percentage is lower than all but three other cheating behaviors when looking at the ranking of "extremely serious" (B6 is 25 percent, B10 is 20 percent, B12 is 19 percent). These results provide evidence that most students (about three-quarters) do not consider this to be an extremely serious form of cheating compared to other behaviors and thus perceive it as more acceptable. Roughly 41 percent of students believe that using AI to write a paper is an extremely serious cheating behavior (again averaging across the two environments). Although this behavior is considered more serious relative to using AI for HW, it is still ranked as less serious than six other cheating behaviors.

The sixth research question, (RQ6) asks if students are self-reporting the use of AI as frequently as other cheating behaviors. Table 4 revealed that about 55 percent of the students surveyed admitted to using AI to complete a homework assignment at least once. This percentage was greater compared to all other cheating behaviors providing evidence that students are self-reporting this behavior more frequently than other cheating behaviors.

Roughly 31 percent of students self-reported using AI to write a paper. This percentage is greater than 11 of the other behaviors again providing evidence that students are self-reporting the use of AI more frequently than many other cheating behaviors. This finding is consistent with other studies finding a growing trend of AI usage in academic work (Jo, 2023; Playfoot, Quigley, and Thomas 2024). The incorporation of AI into educational settings is occurring at an unprecedented pace and research examining student perceptions as well as usage of AI is beginning to grow as well. As students continue to become more experienced with using these technologies, determining how to use large language models to improve learning outcomes while ensuring that student attitudes toward academic integrity remain intact will be an important goal for all institutions of higher learning.

3.7 Limitations

This study is not without limitations. First, the study was conducted at a single higher institution to undergraduate students who were all enrolled in a business course, which limits the generalizability of the findings to other contexts. Second, behavioral data was based on self-reports which often leads to social desirability bias because of the sensitive nature of the topic. This may have led to under-reporting of cheating behaviors. Despite the limitations, this study has added to the literature on academic dishonesty by considering how students rank cheating behaviors in different environments and by introducing the usage of AI as a type of cheating behavior to be analyzed in this way.

4. Conclusion

There are many studies that examine student perceptions of cheating levels in traditional face-to-face versus online cheating as well as self-reported cheating behaviors in these two environments. There are relatively fewer studies that have examined how student beliefs about the seriousness of different cheating behaviors impact the frequency of cheating. As of this writing, the author is not aware of any studies that directly compare student beliefs about specific cheating behaviors related to AI in both the physical and online classroom environments. In this study, students were asked to rank how serious they consider a particular cheating behavior in each of these two environments. Out of fifteen comparable cheating behaviors, results showed that students considered one behavior to be more serious in the in the physical classroom and six cheating behaviors to be more serious in the online classroom. Not surprisingly, this study also found that students with online experience tend to rank cheating behaviors in the online environment as more serious than those students who have not taken an online class.

The present study also supports previous findings that a moderate amount of cheating occurs within the academic setting. However, when looking at the frequency of cheating behaviors, the results of this study did not find evidence of significantly more cheating in the online environment compared to the face-to-face environment. Overall, this study also found that there is a correlation between student beliefs and cheating behavior. That is, when students consider a behavior to be a more unacceptable form of cheating, they are less likely to self-report engaging in that behavior. Finally, when looking at perceptions and frequency of using AI for homework and paper writing assistance, many students consider these to be at least somewhat acceptable behaviors and therefore engage in these behaviors more often than other cheating behaviors

This study was designed to better understand student attitudes about cheating in different environments. As technology continues to offer newer and more efficient ways to obtain information, faculty members and higher education institutions must keep up with how it is being used in both the physical and online environments. Previous literature and the findings of this study would suggest that to influence students to be more honest and ethical in the classroom, faculty and administrators must devise strategies to impact their belief systems. Although students will typically enter college with preliminary ideas about cheating, there is evidence that when faculty members discuss academic integrity in the classroom and enforce violations consistently, positive student attitudes toward cheating among students decreases as does the prevalence of cheating (Carpenter *et al.*, 2006). Providing a strong ethical foundation that becomes rooted within students' personalities throughout their studies is an overarching goal that can start to take shape by including academic integrity discussions into every curriculum, updated frequently to keep up with changing technologies.

AI Statement: The use of AI has not formed any part of this research and/or the drafting of this article.

Ethics Statement: Prior to their participation, all individuals were fully informed about the study's nature, objectives, and how the data would be used. Informed consent was obtained, with participants explicitly assured that their involvement was entirely voluntary and that their responses would be used solely for academic research.

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