Current Psychology (2025) 44:1–17
https://doi.org/10.1007/s12144-024-06965-8

The role of self-efficacy and the fraud diamond on the decision to use assignment assistance websites

Kenneth J. Smith[1] · **David J. Emerson**[1] · **Megan S. Kelly**[1]

Accepted: 6 November 2024 / Published online: 27 November 2024
© The Author(s), under exclusive licence to Springer Science+Business Media, LLC, part of Springer Nature 2024

Abstract
Recently, several factors have exacerbated the potential for college students to circumvent the learning process. These include rapid technological advances, easy information access, pressure to succeed, and the widespread availability of websites that provide "assistance" in completing outside assignments. With data collected from a sample of 964 students pursuing a variety of academic degrees at a U.S. public university in the Mid-Atlantic region, we conducted Partial Least Squares Structural Equation Modeling (PLS-SEM) analyses to assess the impact of individual-level personality factors on student inclinations to use assignment assistance websites (AAW). Specifically, we examined how self-efficacy interacted with the constituent components of the fraud diamond to influence students' decisions to use AAW. We observed that self-efficacy exerted a substantial influence on multiple fraud diamond elements, and that both the fraud diamond and self-efficacy play an influential role in not only students' intentions to use AAW but also their actual use. However, the effects of self-efficacy were fundamentally different between groups identified as cheaters or non-cheaters. For example, although we found that self-efficacy exerted a negative influence on students' motivation to cheat for the full sample and that this effect was stronger for the non-cheaters, we also found that this effect was positive and non-significant for those who reported frequent/very frequent cheating. Conversely, while the effects of self-efficacy on perceived capability were positive for the full sample and three times larger for the cheaters, it was not significant for non-cheaters. These results lead us to believe that there is one or more unmeasured confounding variables that are influential in the cheating decision.

Keywords Fraud diamond · Self-efficacy · Academic misconduct · PLS-SEM

Introduction

Human nature demands that people will seek advantage in any endeavor where there is a benefit to be gained by doing so. Cheating on academic assessments is no exception, and it is a sad truth that many students often resort to a variety of nefarious methods to achieve academic success and each technological advance has created new opportunities. Indeed, a cottage industry of commercialized websites has emerged that facilitate academic misconduct. These assignment assistance websites (AAW) market themselves as learning-support resources intended to promote student understanding of complex topics. While AAW may offer pedagogical value to users, evidence suggests that "the primary purpose for which students pay for access to these sites is to obtain easy access to homework, quiz, and exam solutions" (Emerson & Smith, 2022, p. 276).

Given the prevalence and growing concern over academic cheating using AAW among university students and that the unauthorized use of AAW potentially subverts the learning process, it is important to understand why students decide to use them. If the psychological processes that underlie students' intentions to use AAW can be understood, it may be possible to target interventions designed to thwart them. Indeed, Krou et al. (2021, p. 428) noted that "given the host of maladaptive behaviors and consequences associated

✉ Kenneth J. Smith
kjsmith@salisbury.edu

David J. Emerson
djemerson@salisbury.edu

Megan S. Kelly
mskelly@salisbury.edu

[1] Department of Accounting and Legal Studies, Franklin P. Perdue School of Business, Salisbury University, 1101 Camden Avenue, Salisbury, MD 21801, USA

with academic dishonesty, understanding its antecedents is essential."

This paper applies social cognitive theory (Bandura, 1989) together with the theory of planned behavior (Ajen, 1985) in the context of the fraud diamond (Wolfe & Hermanson, 2004) to evaluate the influence that self-efficacy may exert on students' intention to use, and actual utilization of, AAW. We explore students' motivations, rationalizations, and perceptions of their opportunities and capabilities in their decision to seek the services of AAW[1] and evaluate how individual self-efficacy influences the decision-making process.

There is voluminous evidence supporting the negative association between academic misconduct and self-efficacy. A recent meta-analysis identified sixty-seven unique effect sizes between self-efficacy and academic dishonesty– *all* of which were negative, thereby providing strong support for a negative correlation between self-efficacy and academic misconduct (Krou et al., 2021). In the meta-analysis reported by Krou et al. (2021), the authors identified fifteen possible antecedents to academic misconduct, of which eight were statistically significant with the majority of those having a stronger influence on the outcome than self-efficacy. The authors suggest that students' self-efficacy can influence them to adopt a mastery goal orientation and rely on their own skill to complete assessments rather than resort to dishonest methods. Moreover, Loi et al., (2022) found that students' ability to rationalize (neutralize) an act of dishonesty explained more than twice the variance than that of self-efficacy. So, although prior research has definitively shown that self-efficacy can deter academic dishonesty, the mechanism underlying that association remains unclear. Accordingly, the purpose of our investigation is not to determine *whether* self-efficacy is influential in the cheating decision, but rather *how* this influence is exerted.

Although we expect that, writ large, self-efficacy will exert a negative influence on students' academic misconduct, we also expect that there will be some differential effects at the margins.

To better understand how self-efficacy influences academic dishonesty, we compare two sets of subgroups in our sample. First, we compare the results from respondents with very high levels of self-efficacy with those reporting very low levels of self-efficacy; we next search for significant differences between those individuals who admitted to cheating either '*frequently*' or '*very frequently*' and those who stated that they had never used AAW. By so doing, we hope to further explicate the association between self-efficacy and academic misconduct.

[1] Quizlet, Course Hero, and Chegg.com are the three primary purveyors of assignment assistance services in the U.S.

As noted above, the literature is replete with evidence documenting a negative association between self-efficacy and academic misconduct. Similarly, the fraud diamond (triangle) has been used extensively as a framework to understand academic fraud, and this research has consistently shown that it can explain a relatively large portion of the variance underlying students' intentions to engage in academic misconduct, as well as the behavior itself. For example, Dias-Oliveira, Morais, and Pasion found that the fraud diamond mediated the components of psychopathy and explained more than 20% of the variance for both the prevalence and severity of academic fraud. Moreover, Smith et al. (2023) using a sample of 631 business students evaluated the influence of the dark triad constellation of personality traits on academic misconduct as mediated by the fraud diamond, and found that the model explained nearly half of the variance associated with students' intentions to engage in using AAW and more than a third of the variance for using them. Given that the mechanism by which self-efficacy exerts its influence remains uncertain, it is reasonable to evaluate its effects as an exogenous variable in the context of the fraud diamond. To the best of our knowledge, this represents a unique effort to address this gap by examining the influence of self-efficacy on a specific type of academic misconduct of growing incidence and concern, i.e., AAW usage, through the lens of the fraud diamond.

The following section reviews the relevant literature followed by the development of the theoretical model and presentation of hypotheses. The subsequent section discusses the methods and measures used, participant demographic characteristics, and statistical analyses employed. Next, we discuss the analysis results, followed by practical recommendations, limitations of the study, and conclusions.

Literature review

Social cognitive theory

Social cognitive theory postulates that human behavior is a function of triadic codetermination between the behavior, interpersonal differences (including self-efficacy and outcome expectations) and environmental factors (Bandura, 2012). Self-efficacy, a person's perception that they possess the ability to complete a task, is arguably the most significant determinant of behavior. One's self-efficacy beliefs influence behavior through an interaction of motivational, affective, decisional, and cognitive processes and can be developed in numerous ways including personal experience, vicarious knowledge from observing others, and social persuasion. An individual's self-efficacy beliefs influence how they think, e.g., either optimistically or pessimistically, or in

self-debilitating vs. self-enabling ways. These beliefs determine their ability to stay motivated and thrive under adverse circumstances (Bandura, 2012).

Self-efficacy has been shown to be associated with several attitudinal and behavioral outcomes including academic and work performance, task persistence, learning orientation, number of student study hours, as well as academic misconduct (Elias, 2009). While it is well established that self-efficacy exerts a negative influence on academic misconduct, there is little research on how this influence is manifested.

Theory of planned behavior

The theory of planned behavior (Ajzen, 1985) contends that human behavior is the direct consequence of the intention to perform that behavior, which in turn is a joint function of the individual's attitude toward that behavior, subjective norms, and perceived behavioral control. Behavioral beliefs are related to outcome expectancies and consideration of the likely consequences of the behavior. An internal cost-benefit analysis is assumed to generate an overall attitude toward the behavior. Subjective norms deal with the approval or disapproval by valued referent groups and are presumed to generate pressure to either engage in or avoid the behavior. Lastly, self-efficacy represents the individual's perceived behavioral control and is related to their perception of their ability to perform the behavior. Someone who believes they can overcome obstacles and perform a behavior is likely to cultivate an enhanced sense of self-efficacy toward that behavior (Ajzen et al., 2018).

However, these beliefs are not developed in isolation, and "it is important to realize that the behavioral, normative, and control beliefs people hold about performance of a given behavior are influenced by a wide variety of cultural, personal, and situational factors" (Ajzen et al., 2018, p. 54). Further, a behavior may be differentially influenced by other more predominant factors. That is, attitudinal considerations may drive one behavior while control or normative factors may drive another (Ajzen et al., 2018). Thus, the individual may be subjected to internal conflict when the behavioral, normative, and control beliefs do not coincide, or it may be that only one of those beliefs is relevant to the behavior under consideration.

Fraud diamond

The Oxford English Dictionary (1989) defines fraud as "the using of false representations to obtain and unjust advantage or the injure the rights or interests of another", and Becker et al., (2006, p. 37) define academic misconduct as "any instance in which a student claims credit for the work or efforts of another without authorization or citation". Therefore, academic misconduct can arguably be classified as academic fraud.

The fraud triangle is a theoretical framework developed by Cressey (1953) to understand financial fraud. Cressey identified three common themes among the crimes of convicted fraudsters by finding that the potential fraudster must have a non-sharable financial problem, the opportunity to violate trust, and the ability to rationalize the act.

Wolfe and Hermanson's (2004) fraud diamond conceptualization adds capability as an additional precondition to those articulated in the fraud triangle, i.e., motivation, opportunity, and rationalization. In an academic misconduct context, the "non-shareable financial problem" can be generalized to the individual's motivation to engage in academic dishonesty, and the "opportunity to violate trust" is simplified to one's perception of the opportunity to cheat.

The decision to engage in academic dishonesty may be motivated by several factors including pressure to receive good grades, remain competitive with peers, meet family expectations, or maintain parity with those already engaging in cheating behaviors (Becker et al., 2006; Murdock & Anderman, 2006; Peterson, 2004). Opportunity means that the student must believe that they can commit the act without detection, and capability means that they believe that they possess the abilities to perform it. Lastly, the student must be able to rationalize the act.

Theoretical model

We expect that self-efficacy will interact with the fraud diamond elements in predictable ways. We present our theoretical model in Fig. 1 which illustrates the proposed paths between the constructs. We contend that one's ability to rationalize the decision to use AAW results from the exogenous influence of self-efficacy combined with the joint influence of the other constructs that comprise the fraud diamond.

First, we address the predicted associations between self-efficacy and the fraud diamond elements, as well as those linking self-efficacy with both intention and action. Bandura (2012) noted that "self-efficacy is concerned with people's beliefs in their capabilities to produce given attainments" (p. 15), and it represents one's "tendency to view themselves as capable of meeting task demands in a broad array of contexts" (Chen et al., 2001, p. 63). Those "with higher self-efficacy will pursue more opportunities" and, if they believe they have the capability to perform it, will be more likely to perform it and have an expectation of success (Harrison et al., 2018, p. 60). The inclusion of capability in the fraud diamond was predicated on the presumption that those who believe they have higher levels of capability to

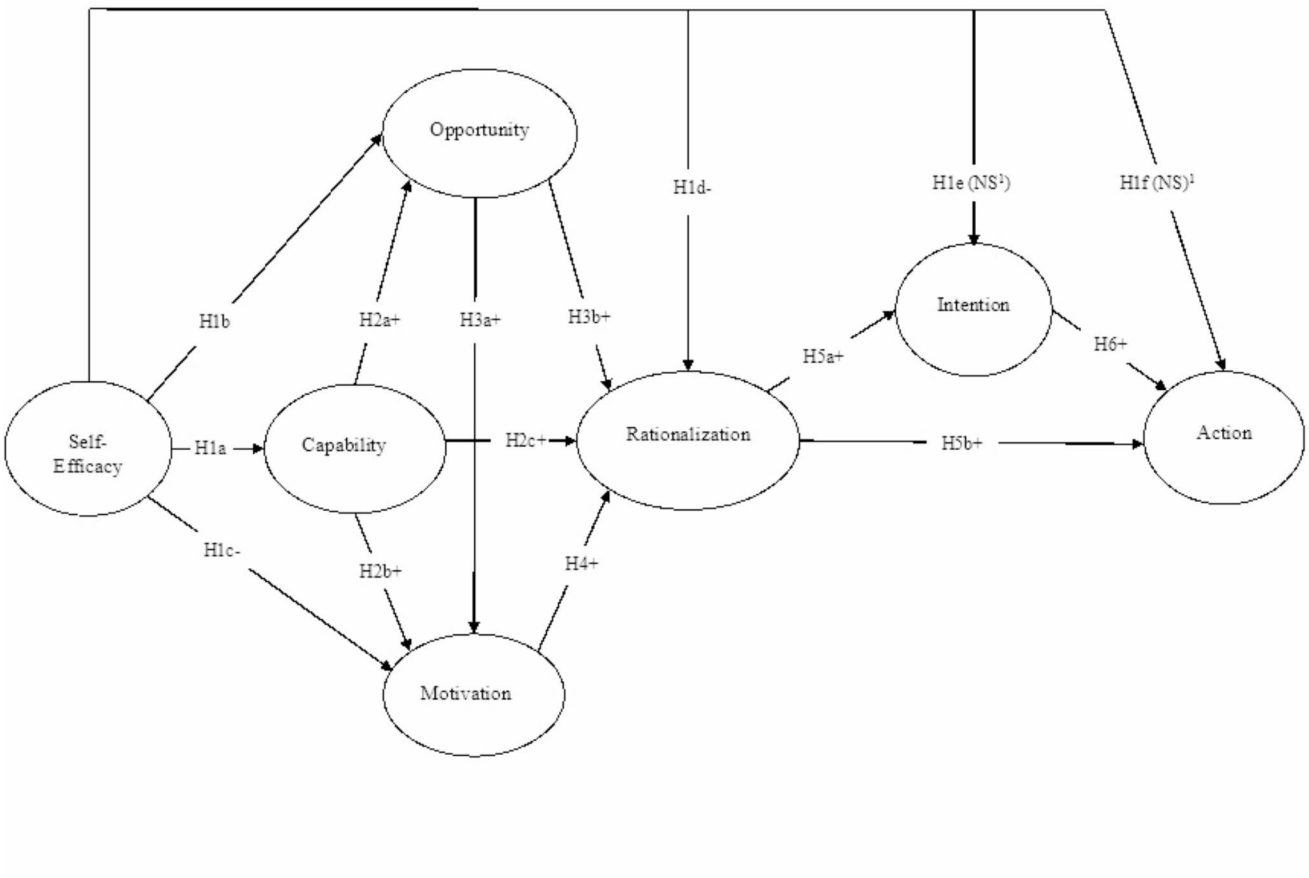


Fig. 1 Theoretical model

engage in fraud will find it easier to perform the act and be more willing to do so (Wolfe & Hermanson, 2004). Thus, at first glance, self-efficacy should be positively associated with the capability.

However, extensive research supporting an overall negative association between self-efficacy and cheating renders it prudent to consider its proposed link with capability at a deeper level. When students exhibit high levels of self-efficacy and feel competent, "cheating is probably neither a necessary nor useful strategy" (Murdock & Anderman, 2006, p. 135). Thus, contemplations of academic misconduct may be dismissed as antithetical. Accordingly, if the student develops a negative attitude toward cheating in general, they may also adopt a negative attitude toward their capabilities. It may be that the attitude toward the distal act (cheating) overrides the proximal attitude regarding their capability to do so. It is also notable that capability is defined as one's perceptions of their abilities related to an act, not their actual capability.

Based on the foregoing, while we expect that self-efficacy will be associated with capability, we do not have an a priori expectation of its directionality.

H1a: Self-efficacy will be associated with capability.

As with capability, the association between self-efficacy and opportunity is also shrouded in ambiguity. On the one hand, self-efficacy may exert a negative influence if the individual holds a negative attitude toward academic misconduct, because if a student isn't motivated, they are less likely to perceive that there is an opportunity to do so (Rundle et al., 2020). Conversely, self-efficacy can be developed through vicarious experience. Individuals who are aware of other students successfully cheating may develop self-efficacy toward their opportunities based on their peers' experiences. While we expect that self-efficacy will be associated with opportunity, we do not have an a priori expectation of its directionality.

H1b: Self-efficacy will be associated with opportunity.

Academic misconduct has been linked to several motivations including the desire to receive high grades, perceptions of unfairness, insufficient time to prepare, a belief that the topic is beyond their ability, or subject matter disinterest (McCabe et al., 2006). However, students with high levels of self-efficacy would reject each of these motivations. One of the most salient aspects of self-efficacy is its association with intrinsic motivation because competencies expectations have been shown to be an antecedent to a learning or mastery focus (Murdock & Anderman, 2006). Moreover, students with poor performance expectations and a fear of failure have been shown to engage in academic misconduct at significantly higher rates than those who expect success. Because high levels of self-efficacy have been shown to be identified with high performance expectations and mastery learning orientation, it is logical to presume that higher self-efficacy should be related to lower levels of motivation toward cheating (Henderson et al., 2022). Thus, we hypothesize the following:

H1c: There will be a negative association between self-efficacy and motivation.

Rationalization is the penultimate and most important step that precedes forming the intent to use AAW. All the other factors may be present, but if individuals are unable to reconcile the proposed act with their internal moral code, they are unlikely to perform it. Those with high levels of self-efficacy will find it difficult to reconcile cheating because they believe that they can achieve their goals without doing so. People with high self-efficacy have more control over their behavior, rely less on social cues and "are more certain about the appropriateness of their thoughts and actions" (Loi et al., 2022, p. 379). Moreover, the ability to rationalize an act is related to the perceived ethicality of that act, and those with low self-efficacy are more likely to perceive cheating as ethical, while those with high levels of self-efficacy are "more likely to view cheating inside and outside the classroom as unethical" (Elias, 2009, p. 205). Indeed, research has shown that a belief in the importance of academic integrity was a significant distinguishing characteristic between those who admitted to cheating and those who did not (Henderson et al., 2022).

Accordingly, we hypothesize the following:

H1d: There will be a negative association between self-efficacy and rationalization.

Because of the extensive body of research supporting a negative association between self-efficacy and academic misconduct we expect that this association will also hold for intentions and actions. However, we expect that the fraud diamond will mediate these associations. Formally,

H1e: After controlling for the effects of capability, opportunity, motivation and rationalization, self-efficacy will have a small or insignificant association with intention.

H1f: After controlling for the effects of capability, opportunity, motivation and rationalization, self-efficacy will have a small or insignificant association with action.

We next consider associations between the individual elements of the fraud diamond. Capability represents one's belief regarding their capacity to successfully engage in academic misconduct. As such, capability likely plays a role in influencing or magnifying the other fraud elements. A student's perception of their capabilities is associated with their judgement that they can commit the act and present the results as their own. Paraphrasing Wolfe and Hermanson (2004), opportunity opens the door to academic misconduct, and motivation and the ability to rationalize the act can draw a person toward it. Students who believe that they have a superior skill set will likely conclude that they possess the capability to leverage any identified opportunities use AAW (Smith et al., 2021), leading us to hypothesize the following:

H2a: Capability will be positively associated with opportunity.

Similarly, if students think they can exploit an opportunity to cheat, they will likely be motivated to do so.

H2b: Capability will be positively associated with motivation.

We also expect that capability will be associated with rationalization. Students contemplating cheating believe that their skill and ability will protect them from detection and punishment, and those who believe they have lower risk will also find it easier to rationalize the decision.

H2c: Capability will be positively associated with rationalization.

Opportunity represents the individual's perception that there are weaknesses in the system that can be exploited without detection. The perception of increased opportunity to commit the act successfully may lead one to reevaluate the act as having low risks and high rewards thereby increasing their motivation to engage in the behavior. "Conversely, should a student not be motivated to cheat, then they would be less

likely to perceive the available opportunity" (Rundle et al., 2020, p. 108). Based on the foregoing, we predict that:

H3a: Opportunity will be positively associated with motivation.

If students believe that there are ample opportunities to cheat and that the possibility of being punished is low, they will be more likely to rationalize the decision (Smith et al., 2021). Some opportunities may present themselves due to missing or inadequate measures to detect or prevent the activity. Peterson (2004) quoted a student blaming the professor for their behavior: "The teacher asks for it. It's not his fault that people cheat, but he doesn't take precautions so that they can't. People are cheaters and he should be aware that if we can, we will" (p. 60).

H3b: Opportunity will be positively associated with rationalization.

Students may justify their behavior by claiming that it is in their best interest, that no one was harmed by their actions, because they feel that they are at a disadvantage and cheating is the only fair and equitable way to succeed, or that it isn't wrong due to an overall normalization of cheating (Brimble, 2016; Henderson et al., 2022). However, irrespective of one's motivation, if the benefits obtained are perceived to be greater than the costs incurred, the student will be inclined to accept the act as morally acceptable. Thus,

H4: Motivation will be positively associated with rationalization.

The fraud diamond can be viewed as a model of the process wherein one develops the intention to engage in an act of misconduct and/or to perform the act. As Fig. 1 depicts, rationalization is a consequence of the joint influence of one's motivation and perception of their opportunities and capabilities, all of which are leveraged by their self-efficacy. Once the individual has rationalized the act, the intention to perform the act is believed "to follow in a reasonable and consistent fashion" (Ajzen et al., 2018, p. 53).

H5a: Rationalization will be positively associated with intention.

The theory of planned behavior predicts that intention immediately precedes action in the causal sequence of events that begins with the establishment of control, behavioral, and normative beliefs (Ajzen et al., 2018). While we expect that the link between rationalization and action will be mediated by intention, it is possible that the act may occur simultaneously with the intention. Thus,

H5b: Rationalization will be positively associated with action.

Intentions are developed based on an individual's attitudes which develop as a function of a broad array of situational, environmental, psychological, and control factors, and "intention is the immediate antecedent of actual behavior" (Ajzen et al., 2018, p. 54).

H6: Intention will be positively associated with action.

Inter-group differences

Those whose self-efficacy levels are very high or very low may view the process underlying the cheating decision differently. For example, Finn and Frone (2004) found that even those with high self-efficacy levels were more motivated to cheat when their performance was low. Moreover, if the individual has previously used AAW and/or witnessed others successfully doing so without consequences, they may become desensitized to the act, making it easier to rationalize the act, regardless of their level of self-efficacy.

Further, there may be fundamentally different associations between self-efficacy and the other elements of the decision-making process for frequent cheaters vs. non-cheaters. If individuals have extensive experience using AAW, they are likely to have significantly different perceptions than their non-cheating peers regarding their capability, ability, and justifications for using AAW, as well as their intentions to do so.

To investigate these concerns, we conducted two sets of inter-group analyses– a comparison between students whose self-efficacy scores fell in the upper versus lower quartile, and one comparing those students who admitted using AAW either frequently or very frequently with those who never used AAW. It is important to use only those who stated that they had *never* used AAW as one of our referent groups because it is likely that those who have never cheated will have an elementally different psychological profile than all the other participants in the study. Once an individual makes the choice to cheat the first time, subsequent occasions do not require them to review their beliefs regarding that behavior (Ajzen et al., 2018).

However, using those that have never used AAW introduces a methodological issue with our data. Specifically, it is impossible to conduct an intergroup analysis when one of the groups has zero variance in the outcome variable. Accordingly, the intergroup analyses reported below reflect

a truncated model with the removal of action as the outcome variable.

The use of a truncated model does not appear to pose any significant theoretical or methodological issues. The theory of planned behavior is predicated on the presumption that intention is the immediate precursor to action, and that once intention has been formed, action is assumed to follow as a direct consequence. Moreover, the structural models conducted in this analysis demonstrated adequate fit, reliability, and validity.

Methods

Participants

Our sample consisted of 964 students enrolled in a variety of majors at a U.S. public university in the Mid-Atlantic region. The Institutional Review Board at the university approved the instrument package for distribution. The survey was distributed via campus email solicitation to all enrolled students during the spring 2021 semester, and instructions provided students with an assurance of anonymity. The data were collected using Qualtrics online survey tool. To address the common method bias potential, we altered the scale ordering.

Demographically, the respondents constituted a broad cross-section of the underlying student population. The sample consisted of students coming from 16 major groups.[2] Of those reporting academic level 126 were freshmen, 199 were sophomores, 246 were juniors, 292 were seniors, 88 were earning master's degrees. Over 93% ($n=887$) of the 952 students reporting credit hours taken were full-time students, and 94% ($n=896$) were unmarried. The mean age was 21.9 (SD = 5.83). The mean GPA was 3.45 (SD = 0.46). Interestingly, while females comprised 58% of the underlying student population, they comprised over 71% ($n=684$) of the 958 respondents who reported gender. This discrepancy is not surprising however, given that prior research has documented differentially higher response rates for females to online surveys (e.g., see Becker, 2022). As reported below however, gender was not significantly correlated with any of the primary study constructs, thus suggesting that it did not skew the results reported for the full sample.

The sample includes approximately 16% of the university's student population during the term we gathered the data.[3] We employed Oppenheim's (1966) early-late hypothesis to determine if any significant variation was present between the responses provided by the initial 50 and final 50 respondents and identified no significant inter-group mean score differences.

Measures

Self-Efficacy We used seven items from Chen et al. (2001) New General Self-Efficacy Scale to measure self-efficacy.[4] The students were instructed to specify the extent of their agreement with each statement on a seven-point scale ranging between *strongly disagree* and *strongly agree*.

Fraud diamond elements We used Harrison et al. (2018) capability measure to evaluate students' perceptions related to using online assistance to complete assignments.[5] Our measures for opportunity and motivation incorporated three questions adapted from Becker et al. (2006) two from Harrison et al. (2018). The rationalization measure consisted of one item from Becker et al. (2006) and three items from Harrison et al. (2018). The items used by Becker et al. (2006) for each of the above-referenced measures were included because they were specifically related to academic misconduct in college. As with the scale for self-efficacy, students were instructed to specify on a seven-point scale their agreement with each statement.

Intention and action We assessed students' intention to use AAW by adapting Harrison et al.'s (2018) three-item intention scale. This construct was measured in the same manner as the scales referenced above.

To capture students' reported usage of AAW services, we asked the respondents how frequently they: (1) sought online homework assistance; (2) aware of a peer who provided an assignment assistance website with assignment solutions; and/or, (3) directly provided solutions to an assignment

[2] While several individual majors were represented (e.g., mathematics), other respondent majors were grouped in the following general categories: hard science; soft science; and liberal arts.

[3] The actual response rate was arguably higher given the likelihood that many students simply failed to check and/or access the invitation to participate message. Despite the fact that email is the stated official means of communication on campus, student failure to regularly check their email messages is an ongoing problem with many students.

[4] We excluded the item of the scale that reads "Even when things are tough, I can perform quite well" from the scale in the interest of parsimony coupled with the fact that it appeared to be redundant with another item that reads "When facing difficult tasks, I am certain that I will accomplish them".

[5] The fraud diamond questions posed by Harrison et al. (2018) were based on the presumption that the survey participant could earn additional funds by exaggerating in an online advertisement a tablet computer's condition.

assistance website. Each of these questions used a five-point scale ranging from 1 = *never* to 5 = *very frequently.*

Social desirability response bias (SDRB) Given the potentially negative implications associated with of some of the questions posed to our participants, we investigated whether social desirability response bias (SDRB) might have influenced the associations measured among the study's constructs. Bernardi and Nash (2022, p. 3) define SDRB as "…a participant's tendency to over (under) report activities that are socially desirable (undesirable)" and note that it is a "pervasive issue with self-reported data that can lead to spurious or misleading results." Studies whose data come from self-report instruments are particularly vulnerable to this type of response bias, calling into question the validity of behavioral research that examines sensitive topics. To address this concern, we used the Balanced Inventory of Desirable Responding Short Form (BIDR: Paulhus, 1991) to assess SDRB in our sample data. This scale measures the tendency to unconsciously give unrealistically favorable self-descriptions. For each of the scale's seven items, the participants were asked to indicate the extent of their agreement on a seven-point scale ranging between *strongly disagree* and *strongly agree*.

Control variables Demographics including gender, age, and academic ability, etc. are noted for their capacity to affect behavioral outcomes (Herda & Lavelle, 2012), and researchers should consider how they believe the structural relations may differ "as a function of the control variables" in assessing their impact (Mueller & Hancock, 2018, p. 450). The tested control variables appear as the first five variables in Table 1. The initial assessment consisted of an evaluation of each control variable's correlation with each of the primary study constructs. As a follow-up, we conducted a moderation analysis for each control that had a significant correlation with one or more of the primary study constructs to assess whether it moderated the structural associations between the constructs, a procedure advocated by Mueller and Hancock (2018).

The correlations among the scales show that there were no significant correlations between either academic level or gender and any of the constructs contained in the primary analyses. Consequently, we excluded them from additional investigation. Indeed, Becker et al. (2006) recommended eliminating unnecessary controls on the grounds that biased parameter estimates may be generated by including superfluous control variables and removing them maximizes the power of structural modeling analyses. However, we did identify significant correlations between GPA, marital status, and age and the primary model constructs. We evaluate

Table 1 Inter-scale pearson correlations

Construct	GPA	Academic level	Marital status	Age	Gender	Self-efficacy	Capability	Opportunity	Motivation	Rational-ization	Intention	Action
GPA	--											
Academic Level	0.070	--										
Marital Status	−0.113	−0.258**	--									
Age	0.120*	0.485**	−0.614**	--								
Gender	0.187**	0.039	−0.059	0.018	--							
Self-efficacy	0.143**	0.095	−0.089	0.128*	−0.063	--						
Capability	0.009	−0.039	0.135**	−0.163**	−0.035	0.120*	--					
Opportunity	0.038	−0.005	0.120*	−0.161**	0.107	−0.005	0.499**	--				
Motivation	−0.131**	−0.073	0.196**	−0.231**	−0.021	−0.174**	0.394**	0.416**	--			
Rationalization	−0.089	−0.045	0.152**	−0.175**	−0.078	−0.091	0.466**	0.446**	0.722**	--		
Intention	−0.151**	−0.082	0.167**	−0.174**	0.009	−0.104	0.355**	0.358**	0.674**	0.684**	--	
Action	−0.097	−0.021	0.188**	−0.201**	0.041	−0.081	0.372**	0.478**	0.538**	0.521**	0.516**	--

*$p < .05$; **$p < .01$

any potential moderating effects in the analyses reported below.

Statistical analyses

We first assessed whether a single factor might be responsible for a significant amount of the covariance identified tested model because research has shown that excessive covariance between constructs can be problematic if the same person provides the data for the dependent and independent variables (Harman, 1976; Podsakoff et al., 2003). Our analysis identified several other explanatory factors making it extremely unlikely that a single factor was responsible for our results. We next evaluated the factor-level variance inflation factors (VIFs). Our model's VIFs were all less than 2.1, below the upper limit of 3.3 recommended by Keck (2015), again supporting the unlikelihood that common method bias affects the model.

We next tested the measurement model's reliability and validity followed by a series of tests to evaluate the structural associations between constructs, thus employing the sequential two-stage approach advocated by Anderson and Gerbing (1988). For both sets of analyses, we evaluated the significance of the factor loadings and path coefficients by applying Hair et al. (2019) suggested complete bootstrapping with 5,000 resamples. We conducted these tests using Partial Least Squares Structural Equation Modeling (PLS-SEM) in SmartPLS 4.0 (Ringle et al., 2024). This study satisfied several criteria where PLS-SEM is deemed an appropriate analytic method according to Manley et al. (2021). These include: (1) it examines multiple-indictor latent variables; (2) extends an existing theory; (3) it evaluates a complex model which contains many constructs and hypothesized relationships; and (4) prediction in one of the study's primary objectives. Moreover, PLS-SEM is noted for its ability to handle non-normally distributed data, small to medium sample sizes (Ali et al., 2016). For a more detailed discussion of the relative advantages of PLS-SEM versus the covariance-based approach (CB-SEM) to examining structural associations, see Legate, Hair, Chretien, and Risher (2023).

We next conducted tests to assess SDRB among the full sample of participants. Lastly, we investigated whether the influence of self-efficacy was invariant between two sets of sub-groups: high vs. low levels of reported self-efficacy and frequent cheaters vs. never cheaters.

Results interested readers are encouraged to contact the corresponding author for a more comprehensive presentation of tables and data analyses

AAW engagement tendencies

Though not presented in tabular form, student responses to survey questions about their intent and actual use of AAW reveals that a significant portion of the sample agreed at some level that they intended to seek AAW assistance before submitting an assignment for grading. Moreover, 83% acknowledged that they used AAW services at one point or another.

Measurement model assessment

We evaluated the fit of the measurement model by examining the standardized root mean square residual (SRMR) and Ringle et al.'s (2024) prescription that good fit is obtained with values less than 0.10. The measurement model SRMR value of 0.081 for this study would thus appear to suggest adequate model fit.

We next evaluated the data's convergent validity and reliability. The average variance extracted (AVE) for each construct ranged between 0.581 and 0.830 with an average of 0.636. Notably, each exceeded 0.500 signifying acceptable convergent validity. We measured construct reliability via Cronbach's alpha and composite reliability (CR).[6] Cronbach's alpha coefficients ranged from 0.461 to 0.898 (mean = 0.725), and although the score for capability and action were less than the 0.60 suggested minimum value, the reported CR values for all the constructs were within Hair et al. (2020) 0.70–0.95 prescribed range[7]. We also evaluated the path loadings between each indicator and its respective construct. These loadings were all statistically significant and ranged between 0.588 and 0.911 with an overall mean of 0.781.

We also conducted a series of Heterotrait-Monotrait (HTMT) discriminant validity assessments designed to test the primary student constructs' empirical distinctiveness from one another (Hair et al., 2019). These tests estimate the correlation between the constructs and if the value "is clearly smaller than one, the true correlation between the two constructs is most likely different from one" (Henseler, Ringle, & Sarsted, 2015, p. 121), thereby demonstrating discriminant validity. Apart from the correlation between

[6] Hair et al. (2020) suggested that Cronbach's alpha is less appropriate than composite reliability because it is unweighted, whereas composite reliability is weighted.

[7] The constructs' composite reliabilities varied between 0.748 and 0.936 (Mean = 0.849).

rationalization and motivation (0.959), the ratio of correlations fell below their prescribed upper limit of 0.90 for conceptually similar constructs. Furthermore, the recommended bootstrapping procedure (5,000-sample) revealed the value of 1 was not among the upper 97.5% confidence interval values, thereby providing additional support for the discriminant validity among the constructs.

Structural model evaluation

Full sample

To assess the conceptual model, for each exogeneous construct we calculated the structural coefficients and associated *t*-values, as well as the R^2 value, effect size (f^2), and predictive relevance (Q^2) metrics. Figure 2 illustrates the final structural model for the full sample. Self-efficacy had a significant positive association with capability, significant negative associations with opportunity, and motivation, but a non-significant association with rationalization, supporting H1a-H1c, but not H1d. H2a-H2c were all supported given capability's significant positive relationships with opportunity, motivation, and rationalization. Moreover, opportunity's significant positive relationships with motivation and rationalization, supported H3a and H3b, and motivation was significantly and positively associated with rationalization, supporting H4. Both H5a and H5b were supported because we identified direct and positive associations between rationalization and both intention and action. Finally, self-efficacy's significant direct negative association with intention, but not with action, supports H1f but not H1e.

Figure 2 also reports each significant path's the f^2 effect size statistic, which measures how an endogenous construct's R^2 value is affected by removing a specific predictor construct (Hair et al., 2019). Cohen (1988) suggested values of 0.02, 0.15, and 0.35 represent small, medium, and large effect sizes. As illustrated, there were small effects for six of the paths, and large effects for three of the paths.

The R^2 and Q^2 values represent the extent of a dependent variable's variance is explained by independent variables and the calculated predictive relevance for each dependent variable. The R^2 value for rationalization indicates that 58.2% of its variance is explained by self-efficacy and the fraud diamond. In turn, antecedents explained 50.5% of intention's variance and 38.5% of action's variance.

The Q^2 statistic measures a PLS path model's predictive relevance, and Q^2 values greater than zero for a specific endogenous construct are indictive of predictive relevance (Shmueli et al., 2019). Hair et al. (2019) specified Q^2 values higher than 0, 0.25, and 0.50 signify small, medium, and large predictive relevance for an endogenous latent construct. The Q^2 values in Fig. 2 signify small predictive relevance for capability, opportunity, motivation, and action, and medium predictive relevance for rationalization and intention. Nevertheless, all the individual Q^2 values suggest acceptable predictive relevance.

We next evaluated the predictive power of our structural model using PLSpredict. This analysis is unique to PLS-SEM and evaluates a model's predictive power using a holdout-sample-based procedure. Predictive power is an assessment of a "model's accuracy when predicting the outcome value of new cases" (Shmueli et al., 2019, p. 2324). This procedure compares the Root Mean Square Error (RMSE), Mean Absolute Error (MAE), and Q^2_{predict} values of a linear benchmark model to those of the PLS path model.

Shmueli et al. (2019) specify that a model's predictive power is supported by lower values for RMSE and MAE statistics, and higher Q^2_{predict} values for the PLS-SEM

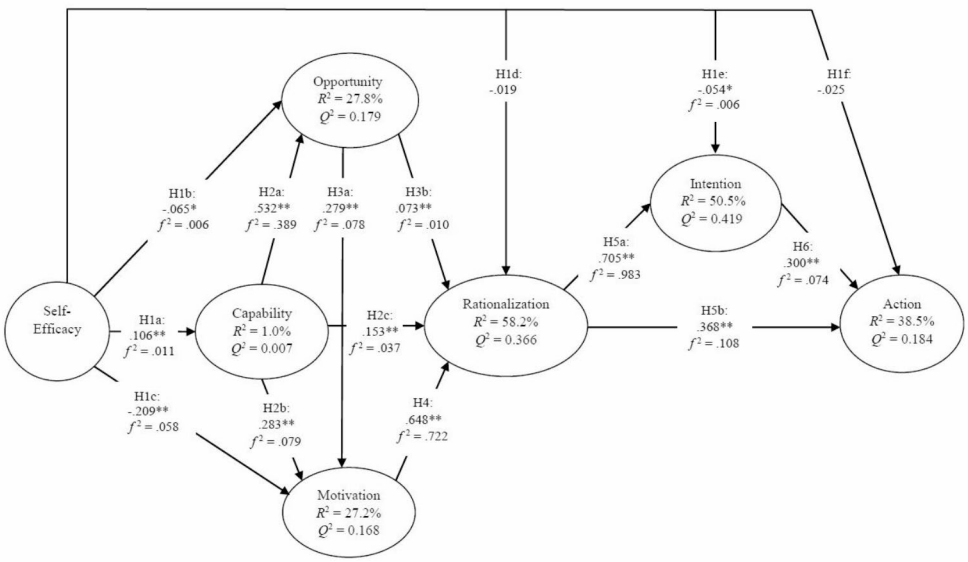


Fig. 2 Standardized path coefficients - Final structural model for full sample. *Note*: Paths between each latent construct and its indicators are omitted for ease of diagramming and interpretability. *p <.05; **p <.01

Table 2 Direct and Indirect effects of self-efficacy and fraud diamond elements on intention and reported use of homework assistance websites (full model)

	Intention			Action		
Construct	Direct effect	Indirect effect [a]	Total effect [b]	Direct effect	Indirect effect [a]	Total effect [b]
Self-efficacy	−0.085**	−0.054**	−0.139**	−0.025	−0.086**	−0.111**
Capability	NA	0.333**	0.333**	NA	0.273**	0.273**
Opportunity	NA	0.179**	0.179**	NA	0.147**	0.147**
Motivation	NA	0.457**	0.457**	NA	0.375**	0.375**
Rationalization	0.705**	NA	0.705**	0.368	0.211**	0.579**

[a] The total indirect effect is the sum of all the specific indirect effects

[b] The total effect is the sum of the direct effect and indirect effect

** $p < .01$

model (vis-à-vis their respective linear benchmark values). The results revealed lower MAE and RMSE statistics and higher Q^2_{predict} values for the PLS-SEM model for eight of the nine intention prediction error metrics, thus suggesting high predictive power for all three intention items. This was the case for one of the three action indicators, thus suggesting low predictive power for action.[8]

Mediation (indirect effects)

We identified no significant direct association between self-efficacy and either rationalization or action, contrary to expectations for H1d and supporting H1f. In addition, self-efficacy had a significant direct association with intention, leading us to reject the presumption of full mediation. To further explicate the mediating influence of the fraud diamond and intention, we conducted a path-analytic breakdown of the direct, indirect, and total effects of self-efficacy and the fraud diamond elements on both intention and action. As Table 2 reports, in addition to its significant direct association with intention, self-efficacy exerts a significant indirect effect. Moreover, although the direct association between self-efficacy and action is non-significant, the former has a significant negative indirect association with the latter for a total effect of −0.111. These findings support the mediating influence of each of the fraud diamond elements on the associations between self-efficacy and both intention and action. There is also a significant indirect positive association between each fraud diamond element and both intention and action.

Control variable analyses

There were significant correlations between specific primary student constructs and GPA, marital status, and age, prompting us to conduct a series of tests to determine if and how many of these control variables moderated any of the measured relationships among the constructs. The multi-sample analyses failed to uncover significant path coefficient differences by marital status or age, thus the full sample results appearing in Fig. 2 also apply to unmarried and married as well as younger and older students.

There was an additional issue of concern with respect to GPA. The overall mean GPA (3.093) of the student population at large at the university was significant lower (@ $p < .01$) than that of the respondent group (3.447). Because those with lower GPAs might be more inclined to cheat to succeed, our data are skewed toward those with higher GPAs. Therefore, our findings might not reflect a differential cheating behavior pattern for lower achieving students because they are underrepresented in the sample. To address this possibility, we compared the sample means of each the primary study constructs between students in the highest and lowest GPA quartiles.

Untabulated results showed that there were two significant differences: (1) the association between self-efficacy and capability was significant and positive among those in the high GPA group, but non-significant and negative among those in the low GPA group; and (2) the positive association between rationalization and action was significantly higher among those in the high GPA group, though significant for both groups. These findings motivated us to then conduct interaction-moderation tests for the full sample. These tests revealed that GPA had a significant positive moderating effect (0.060, $p = .047$) on the association between self-efficacy and capability (but not between rationalization and action). In short, students with higher GPAs report higher capability than their lower GPA counterparts when they report high self-efficacy.

Social desirability response bias tests

We evaluated whether SDRB moderated any of the associations between constructs in the final structural model and found that while SDRB had significant negative direct

[8] Shmueli et al. (2019) specify that the Q^2_{predict} RMSE (and/or MAE) values for each PLS-SEM indicator must exceed zero prior to comparison with the respective naïve linear benchmark values. This is the case for all the intention indicators and two of the three action indicators.

Table 3 Analysis of structural model paths for full sample and non-AAU vs. frequent/very frequent AAW users

Hypothesized path	(a) Full-Sample ($n=964$)		(b) Non-AAW users ($n=160$)		(c) Frequent/Very frequent AAW users ($n=208$)		Inter-group Difference	
	Path Coef.	*p*– value	Path Coef.	*p*– value	Path Coef.	*p*– value	(b-c)	*p* -value
Capability → Motivation	***0.284***	***<0.001***	***0.304***	***<0.001***	***0.326***	***<0.001***	−0.022	0.845
Capability → Opportunity	***0.532***	***<0.001***	***0.393***	***<0.001***	***0.533***	***<0.001***	−0.140	0.143
Capability → Rationalization	***0.153***	***<0.001***	0.097	0.085	***0.240***	***0.009***	−0.142	0.188
Motivation → Rationalization	***0.648***	***<0.001***	***0.670***	***<0.001***	***0.502***	***<0.001***	***0.168***	***0.031***
Opportunity → Motivation	***0.280***	***<0.001***	***0.198***	***0.003***	−0.117	0.211	***0.315***	***0.005***
Opportunity → Rationalization	***0.073***	***0.008***	0.072	0.226	−0.023	0.769	0.096	0.338
Rationalization → Intention	***0.705***	***<0.001***	***0.771***	***<0.001***	***0.433***	***<0.001***	***0.338***	***<0.000***
Self-Efficacy → Capability	***0.107***	***0.004***	0.076	0.492	***0.340***	***<0.001***	***−0.264***	***0.048***
Self-Efficacy → Intention	***−0.054***	***0.028***	−0.058	0.274	0.042	0.568	−0.100	0.271
Self-efficacy → Motivation	***−0.209***	***<0.001***	***−0.260***	***0.002***	0.023	0.788	***−0.292***	***0.034***
Self-efficacy → Opportunity	***−0.065***	***0.015***	−0.123	0.187	0.101	0.122	−0.223	0.066
Self-efficacy → Rationalization	−0.019	0.393	−0.029	0.642	−0.085	0.157	0.056	0.514

Note: Statistically significant path coefficients, as well as inter-group differences and associated *p*-values, appear in bold and italics

associations with most of the fraud diamond elements, it did not have a significant moderating effect on any of the structural associations. Thus, SDRB does not appear to be a significant concern.

Inter-group analyses

Multi-group analyses were employed to assess whether there were significant path coefficient differences between those: (1) in the high and low self-efficacy groups; and (2) those in the frequent/very frequent AAW user group and their non-AAW user peers. Untabulated results revealed no significant path coefficient differences between the low and high self-efficacy groups, indicating that the full sample-model was invariant between these groups.[9]

As noted above, zero variance in the outcome variable, i.e., action, for the non-cheating group precluded a multi-group analysis of path coefficient differences between the two cheating groups using the full-sample model. Thus, we removed action from the model and conducted multigroup analysis between each cheating group on the remaining hypothesized paths.

Table 3 identifies several significant intergroup differences in the relative magnitude of path coefficients between cheaters and non-cheaters. The association between motivation and rationalization for non-AAW users was significantly stronger than that for frequent users, though the paths were significant and positive as predicted for the full sample. This was also the case for the path between rationalization and intention. However, while the path from opportunity to motivation for the full sample and the non-cheaters was positive and significant, the same path was negative and non-significant for the cheaters. As with the full sample, the path from self-efficacy to capability was positive and significant for the frequent cheaters but not significant for the non-cheaters, and the path from self-efficacy to motivation was significant and negative for the non-cheaters and the full sample, but non-significant for the frequent cheaters.[10]

In addition to the significant differences in the relative strength of the path coefficients between frequent cheaters and non-cheaters, we also identified several instances where the path was significant for the full sample but insignificant for one or both referent groups. For example, the path between capability and rationalization was significant and positive for the full sample and the cheaters but insignificant for the non-cheaters, and the path between opportunity and rationalization was significant and positive for the full sample was insignificant for both cheaters and non-cheaters. Similarly, the path between self-efficacy and intention was negative and significant for the full sample but insignificant for either subgroup (positive for the cheaters and negative for the non-cheaters). Lastly, the hypothesized path between self-efficacy and opportunity which was found to be significantly negative for the full sample but insignificant for both subgroups (positive for the cheaters and negative for the non-cheaters).

More important is the cumulative effect of all these differences in *how* self-efficacy influences the cheating decision. Table 4 extends the information provided in Table 3 and presents a path decomposition on the effect of self-efficacy and each of the elements of the fraud diamond on intention

[9] Path coefficient differences between the two self-efficacy groups were not significant when action was removed in the truncated model.

[10] As indicated with the full sample data reported in Table 3, each of the paths and their significance levels for the abbreviated model are congruent with those for the full model.

Table 4 Mean differences & direct and indirect effects of self-efficacy and fraud diamond elements on intention to use AAW (truncated model)

Construct	Non-cheaters				Frequent/Very frequent cheaters			
	Mean[a] (SD)	Direct effect	Indirect effect[b]	Total effect[c]	Mean[a] (SD)	Direct effect	Indirect effect[b]	Total effect[c]
Self-efficacy	39.32 (5.07)	−0.058	−0.153*	−0.211**	37.73 (6.29)	0.042	0.018	−0.060
Capability	11.50 (4.08)	NA	0.294**	0.294**	15.83 (2.76)	NA	0.156**	0.156**
Opportunity	16.25 (5.25)	NA	0.158**	0.158**	23.57 (3.67)	NA	−0.036	−0.036
Motivation	10.11 (5.01)	NA	0.517**	0.517**	20.80 (4.21)	NA	0.217**	0.217**
Rationalization	7.87 (3.56)	0.771**	NA	0.771**	14.51 (3.05)	0.433**	NA	0.433**
Intention	5.96 (3.64)	$R^2 = 0.608$**			12.98 (3.99)	$R^2 = 188$**		

Note: The results for the full sample on the truncated model effectively mirror those presented in Table 3

[a]All mean difference between groups significant at $p < .001$

[b]The total indirect effect is the sum of all the specific indirect effects

[c]The total effect is the sum of the direct effect and indirect effect

*$p < .05$; **$p < .01$

in the truncated model as well as providing information on the means and standard deviations for all the model's constructs for both cheaters and non-cheaters. As shown in Table 4, self-efficacy exerts a strong negative influence on the intention for non-cheaters to use AAW, mimicking the results for the full sample. However, for the cheating group, self-efficacy's effect was very small and not significant. In addition, the cheating group had significantly lower self-efficacy than the non-cheaters but reported significantly higher levels for all the other measured constructs. Moreover, results show that the collective influence of the study's constructs explained over 60% of the variance of Intention for the non-cheating group but less than 19% for those who admitted to using AAW either frequently or very frequently.

Discussion and implications

This study investigated how self-efficacy influences the decision to use AAW services as mediated by the elements of the fraud diamond. We extended this investigation by evaluating possible differential effects based on the individuals' reported level of self-efficacy as well as their admitted engagement in cheating behaviors.

Results from the full sample indicate that the higher one's level of self-efficacy, the lower one's reported intention to engage AAW services, as well as a lower reported use of those services. The fraud diamond tendencies serve to partially mediate the associations between self-efficacy and intent to utilize homework assistance websites, and fully mediate reported usage of those sites.

Intergroup analyses revealed that the full-sample results were invariant with respect to level of reported self-efficacy. However, there were several instances where either the magnitude or significance of the path coefficients among constructs were different between the cheating vs. non-cheating student cohorts and/or between those cohorts and the full sample. These differences may help illuminate how the influence of self-efficacy is manifested in the cheating decision.

As shown in Tables 3 and 4, self-efficacy was found to exert a negative influence through a variety of direct and indirect paths on both the intent to use and reported use of AAW for the full sample, and the influence on the intention to engage is stronger for the non-cheaters. Conversely, self-efficacy had no significant influence on those intentions for admitted frequent users of AAW. The logical question that arises is: *Why*?

Consider first that self-efficacy and capability were not significantly associated for the non-cheater group, and the path between self-efficacy and motivation for the frequent cheater group was non-significant (and positive). This finding is in accord with the presumption that students who do not cheat have expectations of success. Therefore, cheating is unnecessary, and thoughts of academic misconduct are attenuated. The highly significant positive association between self-efficacy and capability for frequent cheaters supports the position that individuals with higher self-efficacy combined with a high level of capability, will find it easier and be more willing to cheat. The fact that frequent cheaters scored significantly higher on their reported capability lends further credence to this possibility.

Results also showed that the path between self-efficacy and motivation was significantly negative for both the full sample and the non-cheaters while it was insignificantly positive for the frequent cheaters. This suggests that

self-efficacy fails to temper the tendency to cheat among frequent cheaters; this difference is likely driven by the fact that frequent cheaters reported motivation scores more than double that of their non-cheating counterparts as well as much higher levels of opportunity and rationalization. These differences combined with the dramatic difference in the level of variance explained in intention (> 60% for non-cheaters vs. < 20% for cheaters) suggest that researchers will need to identify one or more explanatory variables before AAW use among those who use them can be further untangled.

An additional observation regarding the cheating group analyses: the fraud diamond elements fully mediated the association between self-efficacy and intentions for each group. This was not the case for the full sample where this association was significant and negative as was the case in the full model analysis (i.e., that which included Action as well as Intention).

Collectively, these differences indicate that, for frequent cheaters, something other than self-efficacy is driving the decision to engage in AAW, and that low self-efficacy levels alone are not enough to explain the cheating decision. Recall that the multi-group analysis revealed no significant differences in either the intent to engage or actual engagement in cheating behaviors based on the reported level of self-efficacy. Rather, for the cheating group, it appears that the behavior is driven by a confluence of other influential and unidentified individual and exogenous factors. While self-efficacy is influential, it is not essential. Untabulated results reveal that 23% of frequent AAW users reported self-efficacy levels in the highest quartile and 22% of the never cheaters were identified among the lowest quartile of reported efficacy levels. Thus, students with high levels of self-efficacy may cheat if they believe they are performing poorly or if societal norms encourage it (Finn & Frone, 2004). Conversely, a low self-efficacy level is not a definitive determinant of academic misconduct if the student cannot rationalize the act, is otherwise behaviorally predisposed not to, or if environmental factors encourage ethical behavior.

Social cognitive theory provides the theoretical foundation for the presumption of a negative association between self-efficacy and academic misconduct. This theory can also be applied to understand why, in the case of frequent cheaters, self-efficacy does not appear to influence the decision to engage in the use of AAW. This is not surprising. Indeed, Bandura (2012, p. 10) noted that "social cognitive theory does not allege an invariant self-efficacy effect." Indeed, the relative importance of subjective norms, behavioral controls and other attitudinal and environmental factors varies as a function of the behavior and the underlying population (Ajzen et al., 2018). Our results showing self-efficacy's lack of influence among the cheating group exemplifies this possibility, and demonstrates how relatively high levels of perceived capability, opportunity, motivation, and ability to rationalize can dominate the cheating decision above and beyond any influence that self-efficacy may exert.

Practical implications

This study's focus on the independent and interactive influence of self-efficacy and the fraud diamond elements on the student decision to use AAW assistance lends itself to several practical considerations for those seeking to diminish this form of academic misconduct. In general, our findings support efforts by educators to enhance student self-efficacy as it appears to mitigate the positive influence of motivation and opportunity on the decision to utilize AAW. These efforts appear further warranted given self-efficacy's significant direct negative association with intention. One caveat: at first glance, the significant positive association between self-efficacy and capability appears to be a double-edged sword. On the one hand, enhanced positive self-perceptions of capability support overall student achievement: but higher capability is also positively associated with higher levels of motivation and rationalization that ultimately lead to intentions to use, and actual usage of AAW. However, careful inspection shows that the negative association between self-efficacy and motivation is twice as strong as that with capability. That, and the finding that self-efficacy also has a significant direct negative association with intention, further supports the argument that efforts to enhance student self-efficacy may lead to lower AAW usage.

Smith et al. (2023) note that while educators tend to have little influence over students' internal motivations and rationalizations, they have considerable control over both the opportunity for students to cheat as well as the ability to implement controls to reduce those opportunities. Cited strategies include: (1) developing assessment questions not found in any test bank, paraphrasing test bank questions, using more essay-type questions that are unique to the learning goal being assessed; (2) using a third party (e.g., publisher) assignment integrity services with built-in monitoring; (3) reducing time to take assessments such that there is a higher cost to devoting time to seek external assistance; and (4) various combinations of the above. These strategies appear to be propitious given the associations between opportunity, motivation, and rationalization uncovered in this study.

Limitations and conclusions

This study demonstrates the influence that self-efficacy can have in reducing students' propensity to engage in academic dishonesty through its associations with the fraud diamond, and its subsequent effects on intentions and actions. However, our results show that the influence of self-efficacy and the constituent components of the fraud diamond alone are insufficient to fully explain the cheating decision as evidenced by the dramatic disparity in the R^2 values for intention between the frequent and never cheaters.

We provide a more finely grained explication of the cheating decision within the context of the fraud diamond and show how different factors exert divergent effects based on each individual's unique perceptions of their capabilities, opportunities, motivation, and ability to rationalize.

Like all cross-sectional studies using self-report psychometric instrument data, this study has specific limitations. For example, common methods variance might have influenced our results. However, the results of the single-factor test (Harmon, 1976; Podsakoff et al. 2013) and our analyses of the variance inflation factors reveal that our results cannot be attributed to a single, underlying factor. The data's cross-sectional nature raises the possibility that alternative construct orderings might be supported. Our model's foundation on a priori theory and research notwithstanding, causal inferences must await confirmation by longitudinal studies.

Our data came from a sample of student volunteers from a single university who agreed to complete the instrument package. Therefore, interpretation of the results must be viewed with reference to the limited scope of the sample wherein participants may not be representative of the school's underlying student population, or those at other institutions. Students responding in socially correct ways might also have skewed our results. Responding to self-incriminating questions might have resulted in underreporting of homework assistance website activities. However, we designed our survey protocol to ensure the anonymity of our respondents, and our focus was on the associations between the constructs in our theoretical model, not mean values.

Data collection period occurred while the university was operating under COVID-19 pandemic protocols requiring online classes, assignments, and examinations. To an unknown extent, these protocols may have influenced respondent attitudes and responses.

The above-noted limitations notwithstanding, cognizant of the common method variance concerns with studies using self-report instruments, we took several precautionary measures. We protected the anonymity of the respondents to reduce the likelihood that they would feel compelled to answer in socially desirable ways. For example, the anonymity of the respondents was protected with the intent of making participants less likely to respond in a socially desirable, compliant, or compassionate manner. The questions were simple, easily understandable, and from previously validated scales. We also made an effort to avoid consistency of response pattern contamination by including some reverse-coded questions. Finally, we embedded questions as part of a longer survey that included other measures and questions not relevant to the purpose of the present research.

Despite the limitations noted above, this study provides additional evidence of the role of self-efficacy in students' academic misconduct decision process.

Acknowledgements We would like to thank the student participants across campus who volunteered to fully complete the survey instrument package.

Author contributions Author A analyzed the data and contributed to the Methods and Results write-up. Author B contributed to the design, writing, and editing of the Introduction, Literature Review, Hypothesis Development, and Discussion sections. Author C contributed to the design and write-up of the Introduction, Literature Review, and Discussion sections.

Funding Not applicable.

Data availability The data are not publicly available. Interested readers may contact the corresponding author via email to discuss access to the data.

Code Availability Not applicable.

Declarations

Ethics approval and consent to participate Our institution's Institutional Review Board reviewed and approved our proposed study protocol and survey instrument package.

Consent for publication The authors affirm that the student participants affirmatively provided informed consent for publication of this study using the data that they provided.

Competing interests There are no competing interests.

Conflict of interest The authors have no conflict of interest.

References

Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In *Action control* (pp. 11–39). Springer. https://doi.org/10.1007/978-3-642-69746-3_2

Ajzen, I., Fishbein, M., Lohmann, S., & Albarracin, D. (2018). The influence of attitudes on behavior. In B. Johnson (Ed.), *The handbook of attitudes volume 1: Basic principles* (2nd ed.). Taylor & Francis. https://doi.org/10.4324/9781315178103

Ali, F., Kim, W. G., & Ryu, K. (2016). The effect of physical environment on passenger delight and satisfaction: Moderating effect of

national identity. *Tourism Management*, *57*, 213–224. https://doi.org/10.1016/j.tourman.2016.06.004

Anderson, J., & Gerbing, D. (1988). Structural equation modeling in practice: A review and recommended twostep approach. *Psychological Bulletin*, *103*(3), 411–423. https://doi.org/10.1037/0033-2909.103.3.411

Bandura, A. (1989). Human agency in social cognitive theory. *American Psychologist*, *44*(9), 1175. https://doi.org/10.1037/0003-066X.44.9.1175

Bandura, A. (2012). On the functional properties of perceived self-efficacy revisited. *Journal of Management*, *38*(1), 9–44. https://doi.org/10.1177/0149206311410606

Becker, R. (2022). Gender and survey participation: An event history analysis of the gender effects of survey participation in a probability-based multi-wave panel study with a sequential mixed-mode design. *Methods data Analyses: A Journal for Quantitative Methods and Survey Methodology (mda)*, *16*(1), 3–32.

Becker, D., Connolly, J., Lentz, P., & Morrison, J. (2006). Using the business fraud triangle to predict academic dishonesty among business students. *Academy of Educational Leadership Journal*, *10*(1), 37. https://www.abacademies.org/articles/aeljvol10no12006.pdf

Bernardi, R. A., & Nash, J. (2022). The importance and efficacy of controlling for social desirability response bias. *Ethics & Behavior*, 1–17. https://doi.org/10.1080/10508422.2022.2093201

Brimble, M. (2016). Why students cheat: An exploration of the motivators of student academic dishonesty in higher education. *Handbook of Academic Integrity*, *26*, 365–382. https://doi.org/10.1007/978-981-287-098-8_58

Chen, G., Gully, S. M., & Eden, D. (2001). Validation of a new general self-efficacy scale. *Organizational Research Methods*, *4*(1), 62–83. https://doi.org/10.1177/109442810141004

Cohen, J. (1988). *Statistical Power Analysis for the behavioral sciences* (2nd ed.). Lawrence Erlbaum Associates, Inc. https://doi.org/10.4324/9780203771587

Cressey, D. R. (1953). *Other people's money: A study in the Social Psychology of Embezzlement*. Free.

Dictionary, O. E. (1989). *Oxford English Dictionary* (p. 3). Simpson, Ja & Weiner.

Elias, R. Z. (2009). The impact of anti-intellectualism attitudes and academic self-efficacy on business students' perceptions of cheating. *Journal of Business Ethics*, *86*(2), 199–209. https://doi.org/10.1007/s10551-008-9843-8

Emerson, D. J., & Smith, K. J. (2022). Student use of homework assistance websites. *Accounting Education*, *31*(3), 273–293. https://doi.org/10.1080/09639284.2021.1971095

Finn, K. V., & Frone, M. R. (2004). Academic performance and cheating: Moderating role of school identification and self-efficacy. *The Journal of Educational Research*, *97*(3), 115–121. https://doi.org/10.3200/JOER.97.3.115-121

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, *31*(1), 2–14. https://doi.org/10.1108/EBR-11-2018-0203

Hair, J. F., Howard, M., & Nitzl, C. (2020). Assessing measurement model quality in PLS-SEM using Confirmatory Composite Analysis. *Journal of Business Research*, *109*(5–6), 101–110. https://doi.org/10.1016/j.jbusres.2019.11.069

Harman, H. H. (1976). *Modern Factor Analysis* (3rd ed.). University of Chicago Press.

Harrison, A., Summers, J., & Mennecke, B. (2018). The effects of the Dark Triad on unethical behavior. *Journal of Business Ethics*, *153*(1), 53–77. https://doi.org/10.1007/s10551-016-3368-3

Henderson, M., Chung, J., Awdry, R., Mundy, M., Bryant, M., Ashford, C., & Ryan, K. (2022). Factors associated with online examination cheating. *Assessment & Evaluation in Higher Education*, 1–15. https://doi.org/10.1080/02602938.2022.2144802

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, *43*(1), 115–135. https://doi.org/10.1007/s11747-014-0403-8

Herda, D. N., & Lavelle, J. J. (2012). The auditor-audit firm relationship and its effect on burnout and turnover intention. *Accounting Horizons*, *26*(4), 707–723. https://doi.org/10.2308/ACCH-50181

Keck, N. (2015). Common method bias in PLS-SEM: A full collinearity assessment approach. *International Journal of e-Collaboration*, *11*(4), 1–10. https://doi.org/10.4018/ijec.2015100101

Krou, M. R., Fong, C. J., & Hoff, M. A. (2021). Achievement motivation and academic dishonesty: A meta-analytic investigation. *Educational Psychology Review*, *33*(2), 427–458. https://doi.org/10.1007/s10648-020-09557-7

Legate, A. E., Hair Jr, J. F., Chretien, J. L., & Risher, J. J. (2023). PLS-SEM: Prediction-oriented solutions for HRD researchers. *Human Resource Development Quarterly*, *34*(1), 91–109.

Loi, T. I., Feng, Z., Kuhn, K. M., & Tripp, T. M. (2022). When and how underdog expectations promote cheating behavior: The roles of need fulfillment and general self-efficacy. *Journal of Business Ethics*, *181*(2), 375–395. https://doi.org/10.1007/s10551-021-04976-0

Manley, S. C., Hair, J. F., Williams, R. I., & McDowell, W. C. (2021). Essential new PLS-SEM analysis methods for your entrepreneurship analytical toolbox. *International Entrepreneurship and Management Journal*, *17*(4), 1805–1825. https://doi.org/10.1007/s11365-020-00687-6

McCabe, D. L., Butterfield, K. D., & Treviño, L. K. (2006). Academic dishonesty in graduate business programs: Prevalence, causes, and proposed action. *Academy of Management Learning & Education*, *5*(3), 294–305. https://doi.org/10.5465/AMLE.2006.22697018

Mueller, R. O., & Hancock, G. R. (2018). Structural equation modeling. *The reviewer's guide to quantitative methods in the social sciences* (pp. 445–456). Routledge.

Murdock, T. B., & Anderman, E. M. (2006). Motivational perspectives on student cheating: Toward an integrated model of academic dishonesty. *Educational Psychologist*, *41*(3), 129–145. https://doi.org/10.1207/s15326985ep4103_1

Oppenheim, A. N. (1966). *Questionnaire Design and attitude measurement*. Basic Books, Inc. https://doi.org/10.3102/00028312005001128

Paulhus, D. L. (1991). Measurement and control of response bias. In J. P. Robinson, P. R. Shaver, & L. S. Wrightsman (Eds.), *Measures of personality and social psychological attitudes* (pp. 17–59). Academic Press. https://doi.org/10.1016/B978-0-12-590241-0.50006-X

Peterson, B. K. (2004). Application of white-collar crime research to academic fraud: A focus on rationalizations of accounting students. *Journal of College Teaching & Learning*, *1*(5), 51–64. https://doi.org/10.19030/tlc.v1i5.1945

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, *88*(5), 879. https://doi.org/10.1037/0021-9010.88.5.879

Ringle, C. M., Wende, S., & Becker, J. M. (2024). *SmartPLS 4*. Oststeinbek: SmartPLS. Retrieved from https://www.smartpls.com

Rundle, K., Curtis, G., & Clare, J. (2020). Why students choose not to cheat. In T. Bretag (Ed.), *A research agenda for academic integrity* (pp. 100–111). Edward Elgar Publishing. https://doi.org/10.4337/9781789903775.00014

Shmueli, G., Sarstedt, M., Hair, J. F., Cheah, J. H., Ting, H., Vaithilingam, S., & Ringle, C. M. (2019). Predictive model assessment in PLS-SEM: Guidelines for using PLSpredict. *European Journal*

of Marketing, *53*(11), 2322–2347. https://doi.org/10.1108/EJM-02-2019-0189

Smith, K. J., Emerson, D. J., & Mauldin, S. (2021). Online cheating at the intersection of the Dark Triad and fraud diamond. *Journal of Accounting Education*, *57*, 1–20. https://doi.org/10.1016/j.jacc edu.2021.100753

Smith, K., Emerson, D., Haight, T., & Wood, B. (2023). An examination of online cheating among business students through the lens of the dark triad and fraud diamond. *Ethics & Behavior*, *33*(6), 433–460. https://doi.org/10.1080/10508422.2022.2104281

Wolfe, D. T., & Hermanson, D. R. (2004). The fraud diamond: Considering the four elements of fraud. *CPA Journal*, *74*(12), 38–42. https://doi.org/10.1016/S1361-3723(04)00065-X

Publisher's note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Springer Nature or its licensor (e.g. a society or other partner) holds exclusive rights to this article under a publishing agreement with the author(s) or other rightsholder(s); author self-archiving of the accepted manuscript version of this article is solely governed by the terms of such publishing agreement and applicable law.