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## WEB PAPER

# Academic dishonesty and ethical reasoning: Pharmacy and medical school students in New Zealand

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## Abstract

**Background:** There is ample evidence to suggest that academic dishonesty remains an area of concern and interest for academic and professional bodies. There is also burgeoning research in the area of moral reasoning and its relevance to the teaching of pharmacy and medicine.

**Aims:** To explore the associations between self-reported incidence of academic dishonesty and ethical reasoning in a professional student body.

**Methods:** Responses were elicited from 433 pharmacy and medicine students. A questionnaire eliciting responses about academic dishonesty (copying, cheating, and collusion) and their decisions regarding an ethical dilemma was distributed. Multivariate analysis procedures were conducted.

**Results:** The findings suggested that copying and collusion may be linked to the way students make ethical decisions. Students more likely to suggest unlawful solutions to the ethical dilemma were more likely to disclose engagement in copying information and colluding with other students.

**Conclusions:** These findings imply that students engaging in academic dishonesty may be using different ethical frameworks. Therefore, employing ethical dilemmas would likely create a useful learning framework for identifying students employing dishonest strategies when coping with their studies. Increasing understanding through dialog about engagement in academic honesty will likely construct positive learning outcomes in the university with implications for future practice.

## Introduction

There is ample evidence to suggest that academic dishonesty is an area of concern and interest for academic and professional bodies (Aggarwal et al. 2002; Marshall & Garry 2005; Rabi et al. 2006; Caravello 2008; Muhney et al. 2008; Simkin & McLeod 2010). There is also considerable research in the area of ethical and moral reasoning (Cushman et al. 2006; Hauser et al. 2007) and its relevance to the teaching of pharmacy (Latif 2004) and medicine (Tsai et al. 2009). Nonetheless, there is a dearth of empirical research that considers the connection between engagement in academic dishonesty and ethical reasoning amongst students studying pharmacy and medicine. There are, however, strong philosophical arguments that would support this connection (Kohlberg 1975; Ercegovac & Richardson 2004). One such argument posits that educating learners about academic conduct needs to be aligned with their professional experiences and reasoning capabilities (Ercegovac & Richardson 2004).

Academic dishonesty encompasses the areas of cheating, fabrication and falsifying, and plagiarism (Guthrie 2009). The prevalence of academic dishonesty has prompted an increasing interest into the determinants of this phenomenon

## Practice points

- In this study, 91% of students disclosed some form of engagement in copying, 34% in cheating, and 60% in collusion.
- The way students solve an ethical dilemma appears to be related to their levels of engagement in copying information and collusions with other students.
- Male students appear to have levels of tolerance for collusion than female peers. As do pharmacy students when compared to their medical peers.
- Different students likely employ different ethical frames of reference when making decisions about engagement in academic dishonesty.
- Methods of identifying the contributing factors of academic dishonesty are important when devising educational interventions.

(Jurdi et al. 2011). Jurdi and colleagues (2011) suggested that attitudes with respect to academic honesty determined actual engagement in dishonest behavior; this is consistent with established theories such as the theory of planned behavior

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(Ajzen 1991). Furthermore, according to their model, the antecedents that predetermine attitude to, and engagement in, academic dishonesty can be considered in terms of demographics, and psychosocial, academic, and situational factors (Jurdi et al. 2011). In addition, the area of moral and ethical development, albeit theoretically, has been linked to academic integrity (Hardigan 2004; Jurdi et al. 2011). We were interested in this connection and postulated that the process of moral reasoning would likely be a further crucial antecedent that could partly explain perceptions around psychosocial, academic, and situational factors.

We, consequently, propose that the way students respond to ethical reasoning dilemmas would likely be linked to engagement in academic dishonesty. There is considerable information regarding the elicitation of responses from research participants when presented with ethical and moral dilemmas and how ambiguity can influence behavior, such as behaving in a manner contrary to the law (Kohlberg 1973, 1975; Latif 2003). Additionally, Hauser et al. (2007) presented a series of ethical and moral dilemmas requiring a choice between action and inaction, either resulting in lives lost or lives saved. The dilemmas tapped into the notion of double effect whereby either choice would have a significant impact on the lives of hypothetical people. The present study aimed to measure respondents' positions in the medical and pharmacy context in reference to the notions of theft and patient suffering and to gauge levels of association with actual engagement in academic dishonesty. There is also evidence suggesting differences with respect to engagement in academic dishonesty between male and female medical students (Babu et al. 2011). However, other studies have not found differences between male and female students in terms of engaging in academic dishonesty (Rennie & Rudland 2003; Bilic-Zulle et al. 2005; Jurdi et al. 2011).

Furthermore, the present study was interested in comparing activities across two disciplines, namely pharmacy and medicine. The main purpose behind this comparison was to appraise whether these student cohorts engaged in different types of academic dishonesty and to consider attitudes to ethical dilemmas between professional contexts of learning. No articles were found that compared the extent of academic dishonesty between these two cohorts, even though considerable research has examined the extent of the problems within the disciplines (Ng et al. 2003; Papadakis et al. 2004; Bilic-Zulle et al. 2005; Whitley & Starr 2010; Wiggleson et al. 2010).

The primary research question driving the present research was, "Is there a connection between students' engagement in academic dishonesty and their ethical positions in response to a professional dilemma?" The direction of influence was not clearly indicated in the literature; nonetheless, the focus of this study was on what could influence engagement in the academic dishonesty and hence the authors took the position that moral and ethical reasoning could precede decisions related to engagement in academic dishonesty, which is consistent with the theory of planned behavior (Ajzen 1991).

**Table 1.** Demographic details of participants ( $n = 426$ ).

Age categories	
15–19	73
20–24	317
25 and over	35
Gender	
Male	161
Female	263
Course of study	
Medicine	209
Pharmacy	216
Study year	
2	180
3	68
4	174

## Method

### Participants and sampling

Four hundred and thirty three volunteers participated in the study (a response rate of 66%). Seven students were removed from the final analyzes as their responses appeared to be inconsistent with comments. Demographic details of the 426 remaining participants are presented in Table 1 shown above. The study was conducted in the schools of pharmacy and medicine at the Faculty of Medical and Health Sciences at the University of Auckland. Pharmacy students in years 2, 3, and 4 were surveyed while only medicine students studying years 2 and 4 were surveyed. Year 3 medicine students were not surveyed as they were in a critical part of their study program and had been exposed to numerous surveys suggesting that they may be uninterested in the present survey.

### Procedure

At the end of a selected lecture students were invited to respond to a scenario with respect to ethical reasoning and to fill in a questionnaire related to involvement in academic dishonesty. In addition, information was obtained with respect to demographic variables such as age, gender, year, and course of study. Ethics approval for the collection and use of data was obtained from the University of Auckland Human Participants Ethics Committee.

To appraise students' ethical reasoning processes a case scenario was adapted from the works of Hauser et al. (2007) and Kohlberg (1975). Distinct from Hauser et al. (2007), this scenario was based on a realistic scenario so that students could consider their professional context and thus be familiar with this case. The aim of this case was to create an ethical/moral dilemma for Dr Stephens (the frame of reference for student identification) as relevant to both pharmacy and medicine students. The wording of the scenario was as follows: "Dr Stephens is in charge of a patient who is seriously ill. All this patient needs in order to return to his good health is a small dose of drug Z. Unfortunately drug Z is extremely hard to get hold of. However, Dr Stephens knows a source. In order to get the drug she will have to steal it for her patient." Students were asked, "Is it ethically permissible for

Dr Stephens to steal the drug for her patient?” Students were asked to appraise the case using a six-point Likert scale (from never agree to always agree). A commentary box was available below the case to allow students to state their reasons for their decision.

To measure self-reported engagement in academic dishonesty, students were asked to respond to 32 items regarding specific behaviors often cited in the literature in the area of academic dishonesty (Anderson & Obenshain 1994; Coverdale & Henning 1998; Howe et al. 2000; Aggarwal et al. 2002; Harries & Rutter 2005; Marshall & Garry 2005; Muhney et al. 2008; Ryan et al. 2009). The items were selected and appraised by a research panel of five academics who have an interest in academic dishonesty and the items were then randomly placed within the 32-item questionnaire. Students were asked to rate each of the items in terms of a six-point Likert scale of “never true” to “very true.” For example, “using abbreviations written on arm during a written examination,” “using hidden notes in written examinations,” and “copying from a neighbor during an examination without the person realizing.” To provide greater clarity to the interpretation, this initial set of 32-items was examined using exploratory factor-analysis.

A social desirability measure was incorporated, specifically the self-deceptive enhancement (SDE) scale of the Balanced Inventory of Desirable Responding (Paulhus 1991). Li and Bagger (2007) stated that SDE aims to elicit information about “an unintentional propensity to portray oneself in a favorable light, manifested in positively biased but honestly believed self-descriptions (p. 526).” This measure was entered into the analysis to control for this potential confounder.

## Data analysis

Two phases of data analysis were conducted

*Preliminary analyzes.* As aforementioned, to measure self-reported engagement in academic dishonesty, students were asked to respond to 32-items related to the area of academic dishonesty. To establish content validity, the items were selected, appraised and refined, by a research panel of five academics who have an interest and expertise in academic dishonesty. Psychometric evaluation and exploratory factor analysis were employed to consider the factor structure of the 32-item questionnaire (Field 2005) and data reduction processes, as explained below, were instigated.

*Incidence of academic dishonesty.* A multiple analysis of covariance model (MANCOVA) was used to appraise the level of association between the dependent variables (incidence of academic dishonesty) and the independent variables case responses, gender and course of study. Several covariates were also entered into the analytical model to control for potential confounding influences (SDE, age, and year of study). Both age and year of study were converted to two sets of dummy variables. For age, two dummy variables were coded, coding over 25 as 1 and all else 0 (older group) and 15–19 age group as 1 and all else 0 (younger group). In addition, to annul any problems with assumptions related to the cumulative effect of year of study we created a similar set

of dummy variables. Henceforth, two dummy variables were generated: first year two was coded as 1 and all else 0 (younger year) and then year 4 was coded as 1 and all else 0 (older year).

## Results

### Participants

The demographic details (Table 1) show that the majority of students are within the age range of 20 and 24. Age ranges were chosen as the Ethics Committee was cognizant that explicit age disclosure could lead to actual identification. In addition, more female than male students responded to the survey, but equal numbers of pharmacy and medical students responded. Lastly, students from all three years responded, although no year 3 medicine students were surveyed which explains the lower numbers for that year. Some students did not check all items hence some differences in cell counts were found.

### Preliminary analyzes

An overall reliability check of the 32 items inquiring about disclosure in relation to engagement in academic dishonesty was instigated using Cronbach's alpha test (Field 2005). The resultant alpha score ( $\alpha=0.77$ ) indicated that the items are internally consistent.

Nonetheless, to explore multidimensionality the 32 items were examined further using exploratory factor analysis. The factor analytical process followed recommended steps (Field 2005). First, the Kaiser–Meyer–Olkin Measure of Sampling Adequacy (0.81) and Bartlett's Test of Sphericity ( $\chi^2=3278.43$ ,  $p=0.00$ ) were within acceptable limits. Moreover, the overall correlation matrix showed reasonable but not large correlations between items. Second, three definable factors relating to academic dishonesty explained 35% of the total variance in the sample (Factor 1 = 20%,  $\alpha=0.75$ ; Factor 2 = 8%,  $\alpha=0.72$ ; Factor 3 = 7%,  $\alpha=0.62$ ). As such, the initial 32-item questionnaire was reduced to 21-items ( $\alpha=0.81$ , see Appendix for the 21-item questionnaire).

The exploratory factor analysis revealed three identifiable factors that relate to specific areas of academic dishonesty. The three factors were defined as: (1) *copying* relating to items that explicitly probed the notions of copying with or without crediting the source or manipulation of data; (2) *cheating* referring to items related to intentional engagement in the use of unauthorized material by deceptive or dishonest means; and (3) *collusion* in reference to items that imply collaborating with or aiding other students or ignoring actions by other students in relation to academic dishonesty. According to these domains, 91% of students disclosed some form of engagement in copying, 34% in cheating, and 60% in collusion.

### Incidence of academic dishonesty

The three measures of academic dishonesty that emerged from the factor analysis – copying (factor 1), cheating (factor 2), and collusion (factor 3) – were entered as the dependent variables.

**Table 2.** Tests of between-subjects effects for the case scenario, gender and course of study (excluding covariates) in terms of the three academic dishonesty measures.

Source	Dependent variable	MS	F	df <sub>1</sub>	df <sub>2</sub>
Case scenario (CA)	Copying	3.23	1.66*	1	372
	Cheating	0.04	0.32	1	372
	Collusion	4.59	10.94**	1	372
Gender (GE)	Copying	1.31	1.90	1	372
	Cheating	0.00	0.02	1	372
	Collusion	2.51	5.99*	1	372
Course of study (CO)	Copying	1.07	1.55	1	372
	Cheating	0.03	0.28	1	372
	Collusion	2.26	5.39*	1	372
CA*GE	Copying	0.03	0.42	1	372
	Cheating	0.15	0.29	1	372
	Collusion	0.62	1.48	1	372
CA*CO	Copying	0.00	0.00	1	372
	Cheating	0.22	1.90	1	372
	Collusion	0.12	0.29	1	372
GE*CO	Copying	0.21	0.31	1	372
	Cheating	0.15	1.30	1	372
	Collusion	0.03	0.06	1	372
CA*GE*CO	Copying	0.68	1.20	1	372
	Cheating	0.03	2.40	1	372
	Collusion	0.01	0.02	1	372

Note: \* $p < 0.05$ , \*\* $p < 0.01$ .

To explore the possibility of interactions, the responses to the case scenario were converted to a categorical variable by considering the contrast between higher levels of permissibility (ratings 4–6) versus lower levels of permissibility (1–3). Additionally, an inspection of the right skewed distribution of the response scores to the cases scenarios suggested that it would be sensible to create a dichotomous variable. Gender and course of study were also entered as independent variables.

The multivariate analysis revealed significant main effects for “case scenario” (high; low) ( $F(3, 370) = 4.19$ , Wilks’ Lambda = 0.97,  $p < 0.01$ ) and “course of study” (pharmacy; medicine) ( $F(3, 370) = 2.65$ , Wilks’ Lambda = 0.98,  $p < 0.05$ ). No other significant main effects or interactions were noted.

The between group analysis (Table 2) revealed significant effects for “case scenario” (high; low) in relation to copying ( $F(1, 372) = 4.66$ ,  $p < 0.05$ ) and collusion ( $F(1, 372) = 10.94$ ,  $p < 0.01$ ). Further significant effects were noted for gender in terms of collusion ( $F(1, 372) = 5.99$ ,  $p < 0.05$ ) and course of study with respect to collusion ( $F(1, 372) = 5.39$ ,  $p < 0.05$ ). Significant findings were also noted in reference to the covariates, year of study, and SDE in the area of collusion but not cheating or copying. No appreciable directional trend was discerned from the year of study data (Table 3). In addition, those students scoring higher on SDE disclosed more engagement in collusion. No other significant effects were noted.

The mean scores (Table 3) showed that student opting for “high” levels of theft permissibility were more likely engaging in dishonest behaviors than those students in the “low” category. These behaviors included copying ( $M_{\text{high}} = 2.63$ ,  $SD_{\text{high}} = 0.96$ ;  $M_{\text{low}} = 2.21$ ,  $SD_{\text{low}} = 0.85$ ) and collusion

**Table 3.** Means (and standard deviations) of the academic dishonesty domains with respect to case scenario, gender and course of study.

Independent variables		Academic dishonesty		
		Copying	Cheating	Collusion
Case scenario	Low ( $n = 384$ )	2.21 (0.85)	1.14 (0.33)	1.51 (0.65)
	High ( $n = 26$ )	2.63 (0.96)	1.21 (0.42)	2.00 (0.95)
Gender	Male ( $n = 152$ )	2.31 (0.89)	1.17 (0.40)	1.67 (0.79)
	Female ( $n = 256$ )	2.20 (0.85)	1.13 (0.29)	1.46 (0.60)
Course of study	Pharmacy ( $n = 209$ )	2.35 (0.87)	1.56 (0.38)	1.59 (0.69)
	Medicine ( $n = 200$ )	2.13 (0.85)	1.14 (0.28)	1.48 (0.67)
Year of study	Year 4 ( $n = 169$ )	2.27 (0.88)	1.16 (0.39)	1.57 (0.64)
	Year 3 ( $n = 67$ )	2.26 (0.86)	1.13 (0.31)	1.37 (0.53)
	Years 2 ( $n = 169$ )	2.18 (0.84)	1.15 (0.29)	1.58 (0.76)

( $M_{\text{high}} = 2.00$ ,  $SD_{\text{high}} = 0.95$ ;  $M_{\text{low}} = 1.51$ ,  $SD_{\text{low}} = 0.65$ ). In relation to gender, female students ( $M = 1.46$ ,  $SD = 0.60$ ) disclosed lower levels of collusion compared to male students ( $M = 1.67$ ,  $SD = 0.79$ ). Lastly, with regards to course of study, medical students ( $M = 1.48$ ,  $SD = 0.67$ ) disclosed lower levels of collusion compared to pharmacy students ( $M = 1.59$ ,  $SD = 0.69$ ).

## Discussion

The main analysis considered the measures of academic dishonesty, specifically copying, cheating, and collusion in relation to students’ responses to the case scenario, gender and course of study. The foremost findings suggested that the way students disclosed engagement in academic dishonesty, namely copying and collusion, was linked to the way they rated a cases scenario related to a doctor stealing a drug for a patient in need. Moreover, a further aspect of academic dishonesty, collusion, was seen as a differential element with respect to gender, year, and course of study; with male students colluding more than female students and pharmacy students colluding more than medical students. No discernible pattern was evident in the year of study patterns.

Several issues naturally emerge from these findings. First, the discussion considers the association between students’ engagement in academic dishonesty and their responses to the ethical/moral dilemma. Next, the discussion aims to explain and interpret the findings related to gender and course of study.

### Engagement in academic dishonesty

There is a strong argument implying that professional activities are likely grounded in the way people develop principled positions and solve ethical and moral dilemmas (Latif 2000). In reference to this study, engagement in copying and collusion were related to students’ responses to a case scenario. More specifically, students who felt it was appropriate for Dr Stephens to steal a drug for her patient were more likely to disclose engagement in these aspects of academic dishonesty. Without qualitative data it is difficult to identify the actual



reasons why students would engage in academic dishonesty. Nonetheless, Granitz and Loewry (2007) have made some inroads into this question and suggested that students operate from varying ethical frames of reference such as rational self-interest or Machiavellianism (ethical egoism). By appraising plagiarism cases using content analysis, they found most students apply a frame of reference akin to deontology through considering duty and respect for fundamental human rights. However, Granitz and Loewry also determined that many students (18%) were framed according to a system that emphasized self-interest at the expense of others, with the proviso that they have a high probability of not getting caught.

From a pragmatic perspective, it is probable that students have different reasons for engaging in academically dishonest behaviors. For example, some students may be strategically motivated to “get ahead” (Simkin & McLeod 2010). Additionally, Ercegovac and Richardson (2004) posited that several factors could predict academic dishonesty, which include a sense of societal skepticism, lack of trust, alienation from educational authority, larger class size, increased competition, collaborative work projects, lack of understanding, the need to produce higher grades, and fear of failure.

It is, thus, likely that students engaging in academic dishonesty do have different frames of reference and rationales and as such each student's case needs to be considered accordingly. The use of a disciplinary tribunal that incurs penalties related to non-credit for courses, a monetary fine, suspension of attendance, and cancellation of enrollment (The University of Auckland 2010), may be appropriate in cases considered as intentional acts of academic dishonesty, but may not be appropriate for cases not so easily defined.

### Gender and course differences

The findings of this study also indicated a gender difference whereby male students disclosed higher levels of academic dishonesty in the form of collusion than female students. This implies that male students are more likely to be working with others in a dishonest learning environment whether by ignoring behaviors or engaging in peer-related behaviors. This finding supports evidence to suggest that male students are more tolerant towards unacceptable behavior, as noted during group work activities, than female students and this may be related to differences in sensitivity towards context (Underwood 2003). Several other explanations for gender differences have also been posed in the literature, including motivational differences (male students are more extrinsic compared the intrinsic nature of female students) (Hardigan 2004), female dominance in pharmacy (Aggarwal et al. 2002), female students may be more risk-averse (Baker Jr & Maner 2009; Gupta et al. 2009), and male students are more easily affected by social image compared to the independent nature of female students (Aggarwal et al. 2002). Even though they did not find a significant gender result in their study, Jurdi and colleagues (2011) identified that there are different notions of societal responsibility between male and female students and the impact of these differences are not clearly understood or explained in the literature. There may also be an explanation related to choice and persistence (Pintrich & Zusho 2007); for

example, female students may be more conservative in their choice and may likely persist with conventional norms than male students (Hardigan 2004).

Pintrich and Zusho (2007) also stated that there are inconsistencies in this research which may be related to the changing attitudes with respect to gender roles over time (Judge & Livingston 2008). It is important to note that a study conducted on medical students found no differences in cheating in connection with either attitude or responses to behavioral scenarios (Rennie & Rudland 2003). It is further interesting that other studies did not factor in possible gender differences in their study design (Bates et al. 2005; Harries & Rutter 2005; Ryan et al. 2009; Muhney et al. 2008). These studies add credence to the idea that more focused research is required in this area.

In addition, course of study differences were noted in the area of collusion. This suggests that pharmacy students were more likely to ignore other students engaging in dishonest behaviors or more likely to collude with other students when engaging in dishonest behaviors. It is difficult to pose any definitive explanations for this difference based on the data at hand and the lack of research in the area of differences between the pharmacy and medicine. One potential explanation that may be worth exploring further is the differences in selection. Within the New Zealand system, entry into medicine is more competitive relative to pharmacy and the sense of competitiveness may act as a moderator for collusion. In addition, the concept of loyalty to fellow students (Rabi et al. 2006) which may be linked to the hidden curriculum may explain why some students will ignore peer engagement in academic dishonesty or unprofessional behaviors. Bates and colleagues (2005) postulated that pharmacy curricula encourage collaborative learning amongst students and hence students are often unclear on the boundary between collaboration and collusion. Finally, as workloads increase, and numbers of enrolments increase there may be less opportunity for interaction with academic staff, and greater self-directed learning that may push students to collaborate or collude more.

It was interesting to note that other studies have suggested that younger students may be more predisposed to dishonest behaviors than older students (Hardigan 2004), but in this study no age effects were noted. It is conceded, however, that the Ethics Committee reviewing this study would not allow the researchers to collect specific age data because it may lead to identification of individual students thus reducing the sensitivity of this variable. The current authors found no reasonable explanation for the year effect cited in this study. These findings were clouded by not having obtained year 3 medical student data, although it is clear that no difference was noted between year 2 and 4 students suggesting no increased risk of engagement in academic honesty over time. No “*a priori*” assumptions were made in relation to year of study given the dearth of literature in this area and, thus, the present findings may be a useful reference point for further studies. Nonetheless, the differences between years 2 and 4 when compared to year 3 justify inclusion of this variable in the multivariate model as a potential confounder.

There are several limitations associated with this study. First, the sample was obtained from schools of medicine and

pharmacy within a given region and thus generalisability may be limited to that region. In addition, systematic random sampling was not implemented although the high response rate (66%) and large sample size will likely annul any criticisms related to representativeness. Second, the measures of ethical and moral reasoning were developed to be relevant for this student population and constructed to obtain both quantitative and qualitative measures, although it is also acknowledged that other measures used elsewhere could have been considered (Latif 2000; Tsai et al. 2009). It is further acknowledged that self-completion of questionnaires in high interest participants can lead to erroneous sampling since they often come up with strong positive views, but we feel that the 66% response rate would likely yield a good representation of the students' views and SDE was factored in to moderate for any undue influence related to social desirability.

## Conclusion and recommendations

The findings of this study indicate that there is a connection between students' engagement in academic dishonesty and their ethical positions in response to a professional dilemma. More specifically, the present findings suggest that engagement in collusion and copying were related to response positions to a complex case scenario involving a theft option for a doctor due to problems with drug access whilst treating a seriously ill patient. In addition, the findings revealed differences between genders, disciplines, and year of study. No differences were noted for cheating behaviors indicating engagement in academic dishonesty could be narrowed to areas related to: students' communication strategies, distribution and copying of academic material, and group dynamics.

A useful study, Granitz and Loewy (2007) suggest that students employ different ethical frames of reference, and therefore, early detection in relation to how students work with each other in solving complex ethical dilemmas may alert educationists to at-risk students or to gauge how students construct behavior in group situations, thus pre-empting later disciplinary action. Moreover, the case scenario approach could be used to gauge levels of ethical and moral reasoning (Kohlberg 1975; Hauser et al. 2007), which can then be discussed in line with professional conduct both at university as well as implications for future practice (Papadakis et al. 2004). The ways in which students collude to address ethical and moral dilemmas need to be discussed early in their training so that they are adequately prepared for the rigors of professional practice whether it is medicine or pharmacy.

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**Declaration of interest:** The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the article.

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## Appendix

Twenty-one-item questionnaire with factors identified through exploratory factor analysis.

Item description	Factor
Using abbreviations written on arm during a written examination	Cheating
Using hidden notes in written examinations	Cheating
Copying from a neighbor during an examination without the person realizing	Cheating
Copying short sentences (less than 10 words) from another source without appropriate reference or acknowledgment	Copying
Buying a piece of work in order to submit it for an assignment	Cheating
Copying from the internet without appropriate referencing or acknowledgment	Copying
Resubmitting an assignment that was submitted in one course for assessment in another course	Collusion
Handing down work to students in lower years for their use	Copying
Did not report a fellow student engaging in professional duties when under the influence of alcohol	Collusion
Observing a student copying from another student during an examination and doing nothing with the information	Collusion
Copying work from another student's coursework with their permission	Copying
Copying the ideas from another piece of work without appropriate reference or acknowledgment	Copying
Did not report a fellow student engaging in professional duties when under the influence of illegal drugs	Collusion
Using notes written on arm in a written examination	Cheating
Cutting and pasting from the internet with website acknowledgment in bibliography	Copying
Borrowing and copying another student's coursework without permission	Cheating
Removing an assigned reference from a shelf in the library and thereby preventing others from gaining access to the information in it	Collusion
Taking an examination for someone else or having someone else taking an examination for you	Collusion
Delaying taking an examination using a false excuse	Cheating
Changing the words of material from another piece of work and representing it as your own	Copying
Copying a report for a paper from a peer's paper from a prior year	Copying