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## Online Academic-integrity Mastery Training May Improve Students' Awareness of, and Attitudes toward, Plagiarism

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Some evidence has emerged in recent years that plagiarism can be reduced through the use of online mastery tests that are designed to train introductory psychology students in awareness of academic integrity and referencing conventions. Although these studies demonstrated a reduction in incidents of plagiarism they did not directly examine whether the use of mastery tests influenced students' attitudes toward or understanding of plagiarism. Consequently, the authors examined students' awareness of plagiarism and their perception of the seriousness of plagiarism before and after completing an online academic-integrity mastery module in a psychology course. Both students' awareness of plagiarism and their perception of the seriousness of plagiarism increased significantly from before to after completing the online academic-integrity training. Additionally, first-year students who completed the mastery modules showed better awareness of plagiarism and perceived plagiarism to be more serious as compared with a group of second-year students who had not completed the mastery modules in their first year. These results suggest that the use of academic-integrity mastery tests may improve students' awareness of, and attitudes toward, plagiarism.

Universities fight an ongoing battle to reduce plagiarism. Some research has indicated that universities may be losing this battle with studies showing self-reported rates of plagiarism above 80% (e.g., Maxwell, Curtis & Vardanega, 2006) and longitudinal studies indicating increasing rates of plagiarism over time (e.g., Park, 2003). It is preferable to reduce plagiarism via education rather than enforcement (Teh & Paull, 2013), and recently online mastery assessments focused on referencing, academic integrity, and plagiarism have shown promising results in reducing student plagiarism (e.g., Belter & du Pré, 2009).

Traditionally, in psychology courses, referencing conventions have been taught within first-year tutorials and students' understanding of, and competence with, referencing has only been assessed when they have attempted written assessment tasks (Owens & White, 2013). Of late, however, various attempts have been made to teach students about academic integrity and referencing conventions using online mastery assessments (e.g., Belter & du Pré, 2009). Such mastery assessments involve online modules that students must complete with a high level of accuracy (80-100%) before completing written assignments (e.g., Belter & du Pré, 2009; University of Western Australia, 2012).

Research into the effectiveness of mastery assessments in reducing student plagiarism in psychology has provided a number of sources of evidence that such tasks have their desired effect. Belter and du Pré (2009), for example, examined the content of students' assignments using text-matching software and internet searches for suspected plagiarism. They found a reduction from 25.8% to 6.5% in the extent of plagiarism comparing students before and after the implementation of academic-integrity mastery modules. Owens and White (2013) examined actual disciplinary

cases taken against students suspected of plagiarism. They found a significant decrease in cases of plagiarism after the introduction of online academic-integrity mastery modules, which was over and above the decrease that had already been achieved through the use of in-class activities. Curtis and Popal (2011) found a decrease in students' self-reported plagiarism comparing two cohorts five years apart, about half of whom were psychology students, where academic-integrity mastery modules had been introduced in the intervening period. By triangulating the evidence from different dependent measures, including content analysis of submitted assignments, disciplinary cases, and self-reported behaviour, these studies provide evidence that online academic-integrity mastery modules reduce student plagiarism.

Although the evidence is clear that mastery modules on academic integrity reduce student plagiarism, the mechanisms for this reduction are unclear. Self-evidently, at the time students complete a mastery assessment they understand the material, and a lack of understanding of academic integrity has been noted as a key reason why students plagiarise (Devlin & Gray, 2007). It is not known, however, whether the understanding of academic integrity gained from such activities is retained over time. In addition, it is unclear whether such activities influence students' attitudes toward academic integrity. Theoretically, thoroughgoing mastery modules on academic integrity should influence students' attitudes, both by affecting the knowledge component of their attitudes, and through the modeling provided by academics' emphasis on the issue (Myers, 2010). Indeed, one study of psychology students showed that increasing awareness of academic integrity increased the extent to which students perceived plagiarism to be a serious issue (Brown & Howell, 2001).

Various models in psychology propose that attitudes can predict behaviour (see Ajzen, 1991, 2005). Thus, influencing attitudes, particularly the extent to which plagiarism is perceived to be a serious issue, may reduce actual plagiarism behaviour. Two studies of psychology students indicate that the more serious students perceive plagiarism to be, the less likely they think it is that other students will plagiarise (Brown & Howell, 2001; Franklyn-Stokes & Newstead, 1995). The perception of frequency of plagiarism by others is a subjective norm, and other research has found a direct relationship between subjective norms regarding plagiarism and engagement in plagiarism (Jordan, 2001). Moreover, other studies have reported a direct connection between perceptions of plagiarism as a serious issue and actual incidence of plagiarism (e.g., Curtis & Popal, 2011; Maxwell, Curtis, & Vardanega, 2008).

In the present study we examined students' understanding of various forms of plagiarism, and the extent to which they consider these forms of plagiarism to be serious, before and after completing online mastery modules on academic integrity. We predicted that these modules would increase students' understanding of plagiarism and increase the extent to which they considered plagiarism to be a serious issue.

## **Method**

### *Participants*

Participants were students enrolled in first-year psychology courses at Murdoch University, who completed the survey measure before ( $n = 136$ ) and/or after ( $n = 80$ ) completing the online academic-integrity mastery modules. These students were tested in the semester that the online academic-integrity mastery modules were introduced and the module was a compulsory study requirement for first-year students. In addition, second-year students, ( $n = 143$ ) who had not completed the academic-integrity module in their first year, provided a second comparison group. Students at Murdoch University are exposed to a number of interventions designed to enhance academic integrity including policy, education, and the use of Turnitin text-matching software. Students were tested in second-semester courses, thereby ensuring that they had some exposure to 'usual' academic-integrity training before undertaking the mastery modules.

### *Online Academic-integrity Mastery Module*

The academic-integrity mastery module used a series of 18 brief online tasks that provided information to students and included an assessment of learning using between one and five

questions within each task (example items are presented in the Appendix). The tasks increased in difficulty and were delivered through the Blackboard™ learning-management system. Each task focused on discrete elements of knowledge about what constitutes plagiarism, university policies relating to plagiarism, and skills associated with American Psychological Association (APA) referencing. Students had to complete each task with 100% accuracy before being allowed access to the next task. The tasks were computer scored with immediate feedback to students. All tasks had to be completed before students submitted their major written assignments.

A test-item pool was used so that students re-attempting a task did not necessarily receive the same assessment questions, and, where possible, multiple-choice answer orders were randomized so that the correct answer did not always appear in the same place if the task was re-attempted. Additionally, if a student failed to get 100% on a task there was a 15-minute delay before they were allowed to re-attempt the task. The randomization, use of question sets, and mandatory delay for non-mastery encouraged students to pay attention and learn the material, rather than attempting to complete the tests purely by trial and error.

### Survey Measure

The instrument used to assess understanding and perceived seriousness of plagiarism has been used in several previous studies (e.g., Zafarghandi, Khoshroo, & Barkat, 2012), and can be found in full in Maxwell et al. (2008). In this measure, students were presented with scenarios representing seven forms of plagiarism identified by Walker (1998; see Table 1). Students indicated whether they believed the action described in each scenario constituted plagiarism, with the response options: ‘Yes’, ‘Maybe’, or ‘No’. Only responses of ‘Yes’ were interpreted as indicating that students understand that the action described constitutes plagiarism. Perceived seriousness of plagiarism was measured by students indicating the extent to which they considered the actions described in each scenario to be serious, using a 3-point scale: 1 = ‘not at all serious’, 2 = ‘moderately serious’, 3 = ‘very serious’.

Table 1. Types of plagiarism (Walker, 1998, p. 103).

Type	Definition
Sham paraphrasing	Material copied verbatim from text and source acknowledged in-line but represented as paraphrased.
Illicit paraphrasing	Material paraphrased from text without in-line acknowledgement of source.
Other plagiarism	Material copied from another student’s assignment with the knowledge of the other student.
Verbatim copying	Material copied verbatim from text without in-line acknowledgement of the source.
Recycling	Same assignment submitted more than once for different courses.
Ghost writing	Assignment written by third party and represented as own work.
Purloining	Assignment copied from another student’s assignment or other person’s papers without that person’s knowledge.

### Procedure

The participants were provided with anonymous surveys containing information about the study and the survey instrument within their lectures. For first-year students, the pretest was completed in the first three weeks of semester, and the posttest in the final two weeks of semester (resulting in at least nine intervening weeks). For second-year students the survey was completed in the first three weeks of semester. Surveys were returned to a box for collection, not directly to researchers, to protect students’ anonymity – a procedure that increases honest responding (MacDonald & Nail, 2005).

### Results

#### Understanding of Plagiarism

Table 2 shows the percentage of students, by year group and time of testing, who identified all types of plagiarism as types of plagiarism as well as the breakdown by type of plagiarism. There

were no differences among the groups in their understanding levels for four forms of plagiarism (other plagiarism, verbatim copying, ghost-writing, and purloining). These non-significant differences are attributable to ceiling effects, as these forms of plagiarism were well understood to be cheating by most students. Table 2 shows that first-year students who had completed the online academic-mastery modules (i.e., the posttest group) were significantly more likely than first-year (the pretest group) and second-year students who had not completed the modules to report understanding that all forms of cheating examined in the study's measure were plagiarism,  $\chi^2 (2, N = 359) = 16.84, p < .001$ . Comparing the pretest to the posttest within the first-year cohort, there was a significant increase in students' understanding that sham paraphrasing ( $\chi^2 [1, N = 216] = 24.78, p < .001$ ), illicit paraphrasing ( $\chi^2 [1, N = 215] = 4.55, p = .044$ ) and recycling ( $\chi^2 [1, N = 216] = 5.77, p = .023$ ) were plagiarism.

Table 2. Frequencies and percentages comparing first-year students' understanding of plagiarism before and after the academic integrity module, and with second-year students' understanding.

Type of plagiarism	First year pretest		First year posttest		Second year	
	%	n	%	n	%	n
Understand all	25.0 <sub>b</sub>	34	52.5 <sub>a</sub>	42	38.5 <sub>b</sub>	55
Sham paraphrasing	42.6 <sub>b</sub>	58	77.5 <sub>a</sub>	62	68.5	98
Illicit paraphrasing	72.1 <sub>b</sub>	98	84.8 <sub>a</sub>	69	80.4	115
Other plagiarism	97.8	133	97.5	78	98.6	141
Verbatim copying	97.1	132	98.8	79	98.6	141
Recycling	50.7 <sub>b</sub>	69	67.5 <sub>a</sub>	54	60.8	87
Ghost writing	97.1	132	97.5	78	95.1	136
Purloining	99.3	135	98.8	79	100.0	143

Note: Percentages with subscript *a* significantly higher than percentages with subscript *b* in the same row,  $p < .05$ , based on paired chi-squared analysis.

*Attitudes to Plagiarism: perceived seriousness*

Table 3 shows the mean scores for perceived seriousness of plagiarism broken down by group and type of plagiarism. Looking at the seven forms of plagiarism taken together on average, as well as sham paraphrasing and illicit paraphrasing, post-hoc least significant differences tests found that first-year students who had completed the online academic-integrity module rated plagiarism as being significantly more serious than did both first-year students who had not completed the module and second-year students. As with understanding of plagiarism, there were no differences in perceived seriousness for other plagiarism, verbatim copying, ghost-writing, and purloining. Again, the lack of differences may be attributed to ceiling effects, where these forms of plagiarism were considered very serious by almost all students.

Table 3. Means, standard deviations, and one-way ANOVA results comparing perceived seriousness of plagiarism between first-year students' before and after the academic integrity module and with second-year students.

Type of plagiarism	First year pretest		First year posttest		Second year		F(2,354)	p
	M	(SD)	M	(SD)	M	(SD)		
Total	2.54 <sub>b</sub>	(.27)	2.63 <sub>a</sub>	(.25)	2.54 <sub>b</sub>	(.25)	3.64	.027
Sham paraphrasing	1.94 <sub>b</sub>	(.57)	2.16 <sub>a</sub>	(.61)	1.99 <sub>b</sub>	(.64)	3.24	.040
Illicit paraphrasing	2.18 <sub>b</sub>	(.67)	2.42 <sub>a</sub>	(.59)	2.18 <sub>b</sub>	(.63)	4.68	.010
Other plagiarism	2.92	(.27)	2.94	(.24)	2.93	(.28)	.12	.882
Verbatim copying	2.90	(.31)	2.84	(.40)	2.88	(.37)	.68	.503
Recycling	2.03	(.71)	2.14	(.71)	1.98	(.73)	1.31	.270
Ghost writing	2.87	(.40)	2.93	(.26)	2.87	(.37)	.62	.534
Purloining	2.98	(.15)	2.97	(.16)	2.99	(.08)	.69	.501

Note: Means with subscript *a* significantly higher than means with subscript *b* in the same row,  $p < .05$ , based on post-hoc least significant differences tests.

## Discussion

The results of the present study suggest that the online academic-integrity mastery module increased students' understanding of plagiarism and the extent to which they considered plagiarism to be a serious issue, particularly for illicit and sham paraphrasing. These results complement those of previous studies that have found such modules reduce the incidence of student plagiarism (Belter & du Pré, 2009; Owens & White, 2013).

Clearly, some forms of plagiarism (other plagiarism, verbatim copying, ghost-writing, and purloining) were well understood and considered to be serious by students. More importantly, participation in the online academic-integrity mastery modules appeared to increase students' understanding of forms of plagiarism that are typically not well understood. In studies that have used the same measure as was used in the present study, less than 30% of students have reported understanding recycling, less than 60% have reported understanding sham paraphrasing (and this figure has been as low as 28%), and less than 80% have reported understanding illicit paraphrasing (with figures as low as 62%; Curtis & Popal, 2011; Maxwell et al., 2008; Zafarghandi et al., 2012). By contrast, of students who had completed the online academic-integrity mastery module, recycling was understood by over 67%, sham paraphrasing by over 77%, and illicit paraphrasing by over 84%. All of these results, while comparing favourably with the previous studies, also represented a significant increase as compared with the pretest. Additionally, the posttest results were obtained at the end of semester, from students who had completed their mastery modules some weeks earlier, and therefore the results appear to indicate that for many students the information mastered for completing the module was retained.

Examining the results for perceived seriousness of plagiarism, there was again no statistically significant impact of the mastery modules for forms of plagiarism that were well understood (other plagiarism, verbatim copying, ghost-writing, and purloining). Nevertheless, first-year students who had completed the online academic-integrity mastery modules rated all forms of plagiarism, on average, as more serious than did both first-year pretest and second-year students. First-year students who had completed the mastery modules also rated sham paraphrasing and illicit paraphrasing as more serious than did the other students.

The impact of the online academic-integrity mastery modules on perceived seriousness of sham paraphrasing and illicit paraphrasing is particularly important for two reasons. First, studies that break down plagiarism into different types report that sham paraphrasing and illicit paraphrasing are the most frequent forms of plagiarism in which students engage (Curtis & Popal, 2011; Maxwell et al., 2006). Second, studies report a significant negative correlation between engagement in plagiarism and perceptions of seriousness of plagiarism (Curtis & Popal, 2011; Maxwell et al., 2008). Taken together, these findings suggest that increasing students' perception of plagiarism as a serious issue may reduce their engagement in plagiarism in the longer term, and this may be particularly effective if attitudes are changed for the forms of plagiarism in which students most frequently engage.

## Conclusions

The present study's results indicate that online academic-integrity mastery modules are effective in increasing both students' understanding of plagiarism and the extent to which they perceive plagiarism to be a serious issue. Consistent with Owen and White (2013), the impact of these modules was over and above those achieved from existing academic-integrity measures. As these modules appear to add to other interventions, for example, our participants already had high levels of understanding of several forms of plagiarism without completing the modules; we recommend their use as part of a multifaceted approach. In conclusion, we recommend the wider and routine use of online mastery modules for teaching academic integrity in psychology courses, in conjunction with existing strategies.

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### Notes

- [1] We are happy to supply some additional samples of the materials used in the mastery modules to interested researchers, teachers, and academics. Please email your request to Dr Helen Correia: [h.correia@murdoch.edu.au](mailto:h.correia@murdoch.edu.au)

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## APPENDIX

### Examples from the Academic Integrity Modules

Students are initially presented with relevant information in preceding screens, and are then presented with questions to assess their learning. Where relevant, they are also provided with links to supplementary information (see Example 2 below).

#### Example 1. Academic integrity and plagiarism question

Compare the original source with the presented text below. What is wrong with the presented text? Why would it be considered plagiarism?

**Original Source:**

Experiential avoidance is a construct that has been gaining attention in recent years. This construct has been operationalized as an individual's unwillingness to experience feelings, physiological sensations, and thoughts, especially those that are negatively evaluated (e.g. fear), as well as attempts to alter the form or frequency of these events and the contexts that occasion them (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996). Given this definition of the construct,

From page 1257 of: Sloan, D. M. (2004). Emotion regulation in action: Emotional reactivity in experiential avoidance. *Behaviour Research and Therapy*, 42, 1257-1270

**Presented Text**

While emotions may be considered a part of being human, some individuals may find some emotional experiences aversive. Experiential avoidance can be considered as a person's unwillingness to experience feelings, physiological sensations, and thoughts, especially those that are negatively evaluated (e.g. fear), as well as modifying the situations in which they occur in an attempt to minimize those experiences.

- a. A section of the original source is copied word for word without quotation marks
- b. The page number from which the quote was taken is not indicated
- c. The original author and publication year is not cited
- d. All of the above

#### Example 2. Referencing question

Which of the following is correct (see [In text referencing principles](#) for a reminder)?

- a. References only need to be cited at the end of a paragraph.
- b. A reference should be cited at the beginning, middle, and end of a sentence.
- c. If I have read a book by Drone (2000) that talks about Derek's (1959) study, then I need to fully cite Derek's study in the text and in the reference list.
- d. A primary source is the original material that I have read, whereas a secondary source is information about a work that has been written by someone else.



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