The efficacy of using a mobile application to enhance students understanding of academic integrity

Amanda McKenzie, University of Waterloo, Canada
Alice Schmidt Hanbidge, Renison University College, Canada

Keywords: academic integrity; culture of integrity; fundamental values; mobile learning; students in higher education; values-based learning

Building on the original project "Foundation for Academic Success" (Hanbidge & McKenzie) which was presented to the ENAI in 2017, this session will share the final version of the mobile application and the research results on the efficacy of the tool to increase students understanding of academic integrity (AI).

When it comes to teaching students about academic integrity (AI), most universities/colleges rely on educating students about academic expectations during orientation week and in the first week of classes. However, this important information tends to get lost in the excess of information students receive when they arrive on campus. Moreover, most schools rely on instructors to educate students about academic integrity (MacLeod, 2014), yet insufficient time is spent teaching and practicing its concepts (Bertram Gallant, 2008). Furthermore, the quality of instruction about academic integrity is inconsistent and AI is not well reinforced after the start of school. It's evident that these methods are not always effective at increasing students' understanding of academic integrity.

Research Objective

This research project received over $96,000 in 2017 from eCampus Ontario, a quasi-governmental institution, to build a mobile application to promote academic integrity. The objective was to: develop strategies to enhance students' academic integrity (AI) knowledge and understanding by employing mobile technology with an innovative pedagogical approach. The project was twofold, in that we were exploring both the efficacy of the academic integrity content as well as the effectiveness of using a mobile application.

We were tasked with delivering a complete mobile application that had been tested with students, in under 12 months, which was a very ambitious and challenging timeline. The project was divided into three streams: content, technical and research – with a designated team lead for each. The project team determined that they wanted to offer this application in multiple languages (i.e., English, basic Chinese, and French) and in two main platforms (i.e., Android and iOS for Apple). This added a number of layers of complexity and additional work as all the content had to be translated into each language and then developed for use with both smartphone and Apple phone models.

The content of this learning tool, named *Integrity Matters*, is based on the six fundamental

values from the International Center for Academic Integrity (ICAI, n.d.a). Therefore, it takes a unique approach to values-based learning and is not focused on specific AI terminology such as plagiarism, contract cheating or unauthorized collaboration like most other tutorials on academic integrity. Hence, the concepts in the scenarios are not completely bound to academic settings and are highly transferable, as well as being lifelong skills a student can apply in not only their personal lives, but also in the workplace.

A learning module was created for each of the six values. Within each module, there are two value-based scenarios which are scaffolded together. The scenarios were developed by a diverse group from the University of Waterloo and Renison University College campus which included students, librarians and Associate Deans, who enforced the policy on academic misconduct, as well as staff from the Office of Academic Integrity. After students completed all six modules, the *Integrity Matters* tool culminated with a short quiz. Participants who completed the modules and achieved a passing score of 75% on the summative quiz had the option of receiving a certificate of completion and/or an e-badge, which they could display in Facebook, LinkedIn or their e-learning portfolio.

The technical development and coding of the application was outsourced to a third-party vendor who created the tool within our timelines and limited budget. Some design work was done in house (e.g., scenarios were animated) by a team of students, and were translated by faculty with expertise in basic Chinese and French. A research team oversaw recruitment and testing of the application with various student groups on campus, including testing with students who spoke Chinese or French.

Methodology

The research portion of this project was designed using a mixed-method, non-experimental methodology. This study was approved by the University of Waterloo Research Ethics Board (ORE#22437). Participants were recruited through an email invitation sent out to the entire undergraduate student population. The study participants consisted of students (N=1149) from across each of the six faculties and academic years at the University of Waterloo. Each participant was asked to complete a pre and post-test, and a mobile application usability questionnaire. There was also a small control group (N=29) who completed the pre and post-test without completing the module lessons.

Results and Discussion

Most respondents were in their first year of study (52%), followed by students in their fourth year (17%), then second year (16%), and third year (14%), and graduate level students (1.4%), while 1% were null respondents who elected not to indicate their year of study. Representation from each of the six faculties, from largest to smallest, was as follows: Engineering (48.87%), Science (15.18%) Math (12.39%), Arts (12.22%), Applied Health Sciences (6.63%) and Environment (4.71%). Male students accounted for 53% of the

participant group, while 45% were female students, and .02% of the group were null gender (undetermined) students. The participants were 88% Canadian students and 4% permanent residents (i.e., an individual allowed to live and work in Canada without a time limit on their stay, but they are not a Canadian citizen, [Government of Canada (n.d.)]), and 8% were international students with Visa study permits.

Statistical analysis revealed significant differences among participant groups regarding academic integrity testing results, while the control group test scores did not improve significantly from pre to post-test. Statistical tests revealed that the score distribution of pre-test and post-test were significantly different.

There were differences noted between students from various faculties. Students from the faculty of Math performed poorly in the pre-tests but had the most improved scores in their post-tests. Whereas, students from the Faculty of Arts and the Faculty of Applied Health Sciences experienced lower levels of improvement. There were no significant differences between gender groups in their performance on the pre/post-tests. However, there were differences when it came to residency. Canadian students and permanent residents performed significantly better than international students in the pre-test results. International students did not perform as well as other students in their post-test results, but they significantly improved their performance compared to their pre-test results.

Over eight hundred and fifty (N=858) or 74.6% students completed the additional usability survey about the benefit of using a mobile application. Almost 84% of students agreed that learning about academic integrity with the mobile application provided flexibility for them to learn anywhere and at any time. Also, the majority of users (81.3%) enjoyed the digital format, and they found the application was easy to use.

Conclusion

Overall, almost seventy-five percent (74.7%) of study respondents agreed that their academic integrity knowledge increased because of completing these lessons. In addition, over ninety-eight percent of learners successfully completed the post-test questions (i.e., passed with a mark of 75% or higher), demonstrating they learned to distinguish various aspects of academic integrity. Therefore, we concluded that the lessons in the mobile application significantly enhanced students' knowledge of academic integrity.

Some limitations of this study were the smaller number of students used in the control group, and the groups of students that tested the Chinese and French versions of the Integrity Matters application. Hence, further testing with a larger number of students in these sub-groups would be beneficial. Moreover, additional research testing with students from various educational institutions across Canada as well as the United States and beyond, would further test the efficacy of the application with different student populations. Further exploration of the efficacy of the application would also help expand the limited amount of academic

integrity research, particularly in Canada (Eaton & Edino, 2018).

Next Steps

Given that the six fundamental values of academic integrity are fairly universal, the content in the mobile application has the flexibility to be customized and expanded to suit many settings and situations. The current version includes an example of work placement; however, more scenarios could be added to bridge the connections between academia, career path and an individual's personal life. The intent of this application is to reinforce the six values and to show students that these values are life-long skills for them to emulate.

The content of the *Integrity Matters* application is freely available under a Creative Commons license. Users with mobile devices can access the app, as a guest user, through the iTunes Store or Google Play at no cost.[4] A number of organizations, such as the American Councils for International Education and the International Center for Academic Integrity, and higher educational institutions, such as Seneca College, have promoted the application and adapted it for their own use. Further development of the content into different languages such as Russian, Spanish and Punjabi is being explored.

References

Bertram Gallant, T. (2008). Moral panic: The contemporary context of academic integrity. *ASHE Higher Education Report*, 33(5), 1-12.

Eaton, S. E., & Edino, R. I. (2018). Strengthening the research agenda of educational integrity in Canada: a review of the research literature and call to action. *International Journal for Educational Integrity*, 14(1), 5. doi:10.1007/s40979-018-0028-7

Government of Canada (n.d.). *Immigration and Citizenship*. Retrieved Nov. 18, 2019 from https://www.canada.ca/en/immigration-refugees-citizenship/services/new-immigrants/pr-card/understand-pr-status.html.

Hanbidge, A. S. & McKenzie, A. (2017). Foundation for Academic Success: Academic Integrity. In *Plagiarism Across Europe and Beyond – Conference Proceedings*. Czech Republic, Brno: Mendel University. pp. 208-209.

International Center for Academic Integrity (n.d.a). *Fundamental Values of Academic Integrity*. Retrieved Nov. 18, 2019 from https://academicintegrity.org/fundamental-values/

MacLeod, P.D. (2014). *An exploration of faculty attitudes toward student dishonesty in selected Canadian universities*. (Unpublished doctoral dissertation). University of Calgary, Alberta.

---

[4] IOS (https://apps.apple.com/us/app/integritymatters/id1355112345)
Android (https://play.google.com/store/apps/details?id=uwai.dev.integritymatters2)