



POLICY PAPER

Academic Success

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Introduction

As enrolment in higher education continues to grow rapidly, it is essential that in a commitment to promote student learning as well as to uphold McMaster's excellence as an educational institution, the University should make all efforts to ensure that every McMaster student is given equitable opportunity to access quality education in order to succeed academically to the fullest of their potential.

While McMaster University is well reputed as an institution both nationally and internationally, there are still further steps the university can take to work towards ensuring the academic success of all of its students. In this paper, academic success refers to the maximized potential for students to perform well academically.

Student concerns related to their courses begin with enrolling in such courses. The current system in place poses potential barriers to students and should be addressed with revisions to the system that offer pre-emptive conflict resolution.

Once enrolled in courses, undergraduate course management practices have a huge impact on the academic potential of students. Exam scheduling in particular is a concern for students where schedules are not released early enough to accommodate the needs of out-of-province students or conflicts arise out of scheduling issues. Revisions to course management policies will also improve classroom accessibility, thereby translating into more equitable opportunities for students to perform well academically.

Most importantly, at the core of the university experience is the knowledge acquisition; thus, McMaster should strive to incorporate best practices for teaching and learning into its learning environments. This requires a fundamental understanding of the great diversity amongst the student population and the subsequent needs such as a variety of teaching and assessment methods.

The 2017 Academic Services Review conducted at McMaster University unveils other student concerns such as those of only average Teaching Assistant quality, lack of awareness of available academic resources, and lackluster participation in course evaluations¹.

Through addressing the various components of the university academic experience specifically and their individual areas for improvement, McMaster can move forward towards securing its position as one of the top schools in the world. The MSU would like to call on university policy makers and stakeholders to address these student concerns at a system level and make a positive contribution to the learning experiences of existing and future students of McMaster.

¹ Hsu, Megan. *University Affairs Report: Academic Services Review*. (Hamilton: McMaster Students Union, 2017).

Section Title

Section Subtitle (If Necessary)

Principle: Text goes here.

Concern: Text goes here.

Recommendation: Text goes here.

Body text goes here.

Course Registration Variable Course Availability

Principle: All students should be able to access courses that contribute to their personal, academic, and career goals.

Concern: Students are unable to register in courses that are mandatory for degree or graduate admission requirements due to Mosaic's reserve capacity for lectures and labs.

Concern: Students who wish to pursue a minor/Combined Honours declare it later in their undergraduate careers and are not given priority to these courses, making it difficult to fulfill this intention.

Recommendation: Students should be given priority in registration for courses that are unfulfilled on the program requirements section of Mosaic in order to complete degree requirements to eliminate wait times and loads on academic advisors, department and faculty.

Recommendation: Students should declare the intention for a minor/Combined Honours before course registration to be given access to the required courses from the minor course list for fulfillment.

University and other post-secondary institutions are meant to be a period for students to develop the necessary abilities, skillset and knowledge to ensure their success post-undergraduate. In order for students to acquire this quality education, course registration becomes an active figure in facilitating this development. Course registration is a time for students to self-reflect on paths they would like pursue. When this period of time is met with roadblocks, students find it difficult to focus on carving their paths to maximize the success of their undergraduate careers. Currently, registration processes do not give students who require particular courses priority. The current registration process uses a lottery system based on academic level; upper years receiving priority.² Though this is important for graduating students, it can create problems for students who require courses respective to their program requirements in order to graduate in the near future. These courses are either full or reserved based on academic level.

For example, a Level II Psychology, Neuroscience & Behaviour student who has not taken the course "PSYCH 1X03" is required to register in the course in order to fulfill their program requirements. However, these students will be unable to enroll in the course when enrollment opens because available seats are reserved for Level I students. As a result, students in Level II and above in this scenario would therefore be unable to fulfill the program requirement and need to seek aid from their respective faculty.

² "Enrolment Dates - 2017-18." Office of the Registrar. May 10, 2017. Accessed October 30, 2017. https://registrar.mcmaster.ca/enrol/enrol_dates/.

This problem is even more evident for students who wish to pursue a minor/Combined Honours. Mosaic currently does not allow students to declare their intentions to pursue these types of degrees. Subsequently, students are not given priority to courses required to fulfill their desired minor/Combined Honours.

Currently, Vancouver Island University in British Columbia follow a registration protocol where reserved seats are based on program requirements. Following registration based on program, the remainder of the seats become available to other students.³ They also allow students to declare minors/Combined Honours; the course availabilities and priorities are reflective of these declared educational goals. Based on the success of these systems, we recommend that Mosaic take these systems further by incorporating priority based on program. Students with a diamond icon (unfulfilled) on Mosaic in the program requirement section should have a reserved seat for their mandatory course. This should also span to include minors and Combined Honours. By allowing students to declare these education goals, they may be given access to the courses that will fulfill this intention. Specifically, for minors, students should be given priority to those on the minor course list similar to the prioritization listed above for program majors. Ultimately, this change would reduce wait times and loads on academic advisors, department and faculty. Inevitably, this will ensure that course registration is a simple and accommodative process; it must provide students with the access they need to fulfill their self-development academically, personally and professionally.

Mosaic Visibility

Principle: Mosaic should be well equipped with the information necessary for course registration.

Concern: Mosaic's scheduling of full-year courses are inconsistent with the actual locations and timings across semesters; this creates scheduling complications for students.

Concern: Students who may require accommodations are uninformed of the accessibility of their classroom.

Concern: Courses that are not mandatory but recommended are not listed on Mosaic. These courses tend to be prerequisites to many other upper year courses.

Recommendation: Mosaic should have the correct times and locations for full-year courses across semesters to eliminate timetable conflicts.

³ "Reserved Seats." Vancouver Island University (VIU) f. Accessed October 30, 2017. <https://www2.viu.ca/registration/guide/regfeat.asp>.

Recommendation: Mosaic should provide information on the accessibility features of a classroom in the course information section.

Recommendation: Recommended courses should be an added function to Mosaic to improve visibility to facilitate the fulfillment of program requirements.

In order for course registration to be successful, students should be given all the necessary information they need when deciding to enroll in a course. Students have shared frustrations about the lack of transparency with course information on Mosaic. Subsequently, students are met with unfulfilled program expectations, accessibility concerns, complications in scheduling, and/or poor classroom experience. Logistically, Mosaic provides minimal information for students to prepare for their courses. Specifically, scheduling conflicts are common with full-year courses. Currently, Mosaic does not reflect accurate location or timing of lectures across semesters. Mosaic simply uses filler times and locations for semester two which are unreflective of the actual time and location. This poses as a challenge when other courses are conflicting with these times slots that go unrecognized by Mosaic. It also forces students to use external forums to organize their schedules. Many of these students as well as many more students who do not register with Student Accessibility Services require information on the accessibility of a classroom. In accordance with McMaster's Accessibility Policy, which highlights a commitment to the universal design of learning, adding this information to Mosaic would be a simple step towards this principle.⁴ Even more so, the government is currently developing an Education Standard for AODA, which will require that McMaster is aware of the accessibility features of its classrooms.⁵

Mosaic's lack of information also presents an issue for recommended courses; this being courses that are not significant enough for enforcement, yet important to students who wish to pursue a particular academic, professional or personal path. These courses may also be pre-requisites to many upper year courses. Currently, these courses are listed on outdated course calendars that are unreflective of the courses available to students in the coming academic year. Students unaware of identified recommended courses then miss out on opportunities they may desire to pursue. By increasing the visibility of pre-identified recommended courses on Mosaic, we can ease the registration process as well as inform students of the options available to them. Similarly, providing information on course logistics increases student awareness on the

⁴ McMaster University Policy on Accessibility. Report. Senate, McMaster University. February 10, 2010. Accessed October 30, 2017.

<https://www.mcmaster.ca/policy/General/HR/Accessibility.pdf>

⁵ "SNOW & Accessibility for Ontarians with Disabilities Act (AODA)." Accessibility for Ontarians with Disabilities Act (AODA) | SNOW. 2017. Accessed October 30, 2017.

<https://www.snow.idrc.ocad.ca/node/195>.

non-academic components of the classroom. Thus, Mosaic should give students the information they need to successfully register in courses they require and enjoy.

Course Conflict Resolution

Principle: All students should be able to complete their required and elective courses without conflict.

Concern: The process of course conflict resolution is unclear.

Concern: Course conflicts cause unnecessary stress for students.

Recommendation: The Office of the Registrar should develop a standardized conflict resolution form to streamline the process.

Recommendation: The conflict resolution form should be available on Mosaic to ensure accessibility.

Course conflicts are inevitable; however, course conflicts between required courses and relevant elective courses cause unnecessary barriers for students to complete their degrees in a timely manner. To resolve this conflict, it is recommended that the Office of the Registrar develop a standardized conflict resolution form to streamline the process. This form should be easy to fill out and accessible to all students through their Mosaic accounts. It should be available as soon as the course timetable is released to ensure that the resolution occurs in a timely manner. Overall, this will improve the student experience during the course selection period and become easier for the Office of the Registrar to delegate resolution tasks and to ultimately fix the problems students may encounter.

Undergraduate Course Management Accommodations and Support

Principle: Students should have equitable access to courses regardless of difference in learning experience.

Principle: McMaster University values the learning experience of all undergraduate students, and aims to thus support this learning.

Concern: Some students and faculty may be unaware of available accommodations and supports, which disincentivizes or disallows students from accessing such accommodations.

Recommendation: Increase visibility and incentive for students to become notetakers for courses by highlighting these services in the course content, and by offering participation marks for contributing to the notetaking service.

Recommendation: Mandate the addition of RISO and SAS Form breakdowns on course syllabi.

Recommendation: Available accommodations and relevant services should be universally communicated within courses to all students in order to promote access.

Academic accommodations for students at McMaster University are currently required to be organized by the student through a second party (SAS) without disclosure of diagnosis, but with medical/official documentation.⁶ While uniform processes are necessary for efficiency and equal administration of courses, these processes are often difficult to navigate and can be ostracizing for students. The MSU thus recognizes that increased visibility of accommodation services and lessening the silo-ing of the current system is important to increasing the success of students using these services.

In order to best support students that are seeking accommodations, these accommodations need to be more readily accessible. The requirement to be registered with SAS can be a barrier for many students, thus again blocking students from using the available resources and succeeding academically. The SAS notetaking service is one such resource from which many students can benefit, and many do not know about the service unless they are already heavily involved with SAS. This is an important consideration, as it is often thought that needs for accommodations and other similar experiences go unreported.⁷ Featuring SAS services on the course syllabus would enable them to be more widely accessed, and the increased visibility would allow for more students to contribute to services like notetaking. It would also be beneficial if more educators provided this information through other means, such as highlighting

⁶ McMaster University. "Academic Accommodations of Students with Disabilities." (Hamilton, ON: McMaster University, 2017).

⁷ Vice President (Education). "MSU Accessibility Forum Report 2015-16: Breaking the Stigma." (Hamilton, ON: McMaster University, 2016).

during a lecture, or posting on online forums such as Avenue to Learn. If more notetakers are needed, incentivising students to be a part of this service by providing participation marks or through other available means could assist in this matter.

Land Acknowledgements

Principle: As per the Truth and Reconciliation Commission's Calls to Action, McMaster University is to acknowledge and respect the Treaty agreements of the land that the University is situated on.

Principle: For McMaster to fulfill the responsibility of educating its students on Indigenous history, treaty relationships, and reconciliation, all students must be aware of this priority.

Principle: Land acknowledgment is an important first step in decolonization and reconciliation.

Concern: Some students are not aware of or taught about Indigenous history in Canada.

Concern: Current course syllabi do not acknowledge the land that the university is situated on.

Recommendation: Mandate the addition of the following statement to course syllabi: The University would like to acknowledge that we are situated on traditional Haudonesaunee and Anishanaabe territory under the "Dish With One Spoon" Wampum Treaty.

As the City of Hamilton is part of the land that was subject to the Treaty 3 purchase between the Mississauga (Anishinaabe) First Nation and the Crown in 1792, McMaster University has a complex relationship with the land it resides on.⁸ This relationship is one that students and other individuals on campus may be unaware of. While mandating the inclusion of a land acknowledgment is but one step on the path to truth and reconciliation, there is much anecdotal evidence that post secondary education is the first time that many students have learned of Canada's history with Indigenous peoples.

⁸ Zimmer, David. "Treaties." Ontario.ca. October 27, 2016. Accessed February 23, 2017. <https://www.ontario.ca/page/treaties>

The Truth and Reconciliation Commission's 10th Call to Action states that Canadian educational institutions should "[respect] and [honour] Treaty relationships."⁹ By recognizing across the University's undergraduate courses that McMaster is situated on Indigenous land, students are more likely to respect, recognize, and learn about Indigenous issues on campus and in Canada more broadly. This pertains to a student's academic success in that all students will be able to learn more holistically and contextually on an Indigenized and critically aware campus.

Course Evaluations

Principle: Students should be involved in the evaluation process of courses and educators.

Principle: Course evaluations provide a feedback mechanism that should be utilized to their fullest extent in the evaluation and management of courses.

Concern: Course evaluations are underutilized despite their value for advancing learning.

Concern: Some students are unaware or dissuaded from completing and submitting course evaluations because of a perceived lack of capacity for change through this mechanism.

Recommendation: Mandate that course evaluation dates and instructions or URL are stated on course syllabi.

Recommendation: Provide opportunity and/or incentive in each class for students to complete the pertinent course evaluation.

McMaster University recently underwent a review of their Course and Teacher Evaluation process,¹⁰ wherein the authoring committee put forth recommendations to improve upon the undergraduate course and teacher evaluations that are currently being conducted. These recommendations are in alignment with the MSU's perceptions of the value of course evaluations, and how these measures should be implemented. Furthermore, results from this review align with the MSU's 2016–2017 Academic Services Review.

Course and educator evaluations are thought by many to be paramount to the continuous growth of teaching for institutions and enhanced learning for students.¹¹ That being said, there is much research in the lack of communication to students, and

⁹ Truth and Reconciliation Commission of Canada. *Truth and Reconciliation Commission: Calls to Action* (Winnipeg, MB: Truth and Reconciliation Commission of Canada, 2012).

¹⁰ MacPherson Institute Course and Teach Evaluation Committee, "Recommendations to Improve Course and Teacher Evaluations" (report, McMaster University). May 31, 2017.

¹¹ Gravestock, P. & Gregor-Greenleaf, E. (2008). *Student Course Evaluations: Research, Models and Trends*. Toronto: Higher Education Quality Council of Ontario.

subsequent student lack of awareness, of what these evaluations effect.¹² According to the Academic Services Review, students felt that course evaluations went either unread or did not result in change.¹³ With the move to online course evaluations, educators saw a benefit of time and cost savings, but students experienced less of a focus on the evaluation process.¹⁴ Overall, student experience of course and educator evaluations have been a dissuasion from completing the evaluations themselves. Students are more likely to complete evaluations when prompted, given time, and provided incentive to do so.¹⁵ Likewise, communicating the process by which these evaluations (and others) are considered, will provide students the assurance that their feedback is meaningful and can result in change when necessary.

Assessment Ban

Principle: Under the Assessment Ban, students have the right to a period of time before exams where assignments worth more than 10% of the final course grade cannot be assigned, with the exception of assessments held in normal class time slots and assigned at the beginning of the semester on the course outline.

Principle: Students and instructors should uphold the policies outlined in the Undergraduate Course Management Policy.

Concern: There are no current avenues for students to report infractions of the Assessment Ban.

Concern: Professors and educators schedule assessments and due dates within the Assessment Ban period.

Recommendation: The University should create a form or medium for students to report Assessment Ban infractions.

Recommendation: The University should mandate the addition of the Assessment Ban period and include its criteria and rules in course syllabi.

¹² Kelly, Mary. *Student evaluations of teaching effectiveness: Considerations for Ontario universities*. Council of Ontario Universities, 2012.

¹³ Hsu, Megan. University Affairs Report: Academic Services Review. (Hamilton: McMaster Students Union, 2017.)

¹⁴ Bothell, T.W., and T. Henderson. (2003). Do online ratings of instruction make sense? *New Directions for Teaching and Learning* 96: 69–80.

¹⁵ Norris, J., and C. Conn. (2005). Investigating strategies for increasing student response rates to online delivered course evaluations. *The Quarterly Review of Distance Education* 6: 13–29.

The Assessment Ban was intended to allow students to prepare for exams without the stress of other examinations. The current ban covers the last five days of classes plus the day(s) between the end of classes and the beginning of exams. Examinations covered by this ban include;

- a) Assignments worth more than 10% of the final course grade
- b) Tests and Exams
- c) Take home exams worth more than 10% of the final course grade¹⁶

Despite this being an established policy by the university, professors still schedule due dates for examinations and assignments during this week. Currently, McMaster contains no formal reporting system for policy infractions. The OMBUDS office is currently responsible for dealing with these academic disputes, however, developing a formal reporting system would allow for more efficient processing of these issues. Even more so by increasing visibility of the Assessment Ban period, we can actively work to reduce the number of instructor infractions as these dates are now publicly aware to students as well as professors who may be ill-informed.

Exam Scheduling

Principle: Exams should be a period and opportunity for testing and reflection with minimal stress due to other variables.

Principle: Students should be given adequate time to prepare, study and schedule for exams.

Concern: Some students struggle to accommodate, study, and plan around exam schedules due to the late release of the schedule in the semester.

Concern: Regulations for exam scheduling are inadequate and do not give students equitable opportunity to succeed.

Concern: Students who have exam scheduling conflicts (i.e. they have multiple exams at the same time, or have multiple exams back to back) are unaware of how to reschedule exams or report the need for rescheduling.

¹⁶ *Undergraduate Course Management Policy*. Report. Senate, McMaster University. June 4, 2014. Accessed October 30, 2017. <http://www.mcmaster.ca/policy/Students-AcademicStudies/UGCourseMgmt.pdf>.

Recommendation: The 24 hour or calendar day period (midnight to midnight) for multiple exam scheduling should be extended to 36 hours.

Recommendation: The exam schedule should be released at the beginning of the semester.

Recommendation: Instructions should be given to students on how to report exam scheduling conflicts in the same resource that notifies students of their exam schedule (e.g. make conflicts appear in red on the schedule for the student, with a note saying “If you see red, contact X”).

Exams are a crucial time for students during their undergraduate careers. Although this can be a period where students can reflect on the information they have learned over the term, it can also be stressful as students focus on ensuring their academic success. However, logistical issues such as exam scheduling can hinder this academic focus. Currently, McMaster releases exam schedules less than two months before examinations begin. This is an inadequate time frame for students to coordinate study schedules while still having to balance course work. Even more so, this late release also poses an issue for students who have to coordinate travels for the Winter recess. More so, this period is inconsistent between terms and academic years. Beyond scheduling, the current Undergraduate Examination Policy does not sufficiently regulate for multiple exams within a short period of time. The policy outlines that re-scheduling of exams can only be applied to students who have:

- a) More than one examination scheduled at the same time
- b) Three examinations in one calendar day (midnight to midnight)
- c) Three consecutive examinations over two days
- d) December only: two consecutive examinations if the first examination is three hours in duration.¹⁷

The current “calendar day” only accommodates for midnight to midnight but does not include exams that were scheduled the evening before. For example, if a student has a PSYCH 1X03 exam at 7PM on the first day, another exam at 9 AM the next day and another at 4:30 PM on the same day, this would not be accounted for. Exam schedules as such are undeniably stressful, however, this issue can be resolved by changing the “calendar day” period to a 36-hour period rather than a 24-hour period. Even more so, logistical coordination of exam re-scheduling can be simplified for both faculty and students by providing students with instructions on how to report conflicts. This can be done through the same exam schedule medium on Mosaic. Ultimately, these goals ensure that exams are fair, equitable and not excessively taxing on students.

¹⁷ *Undergraduate Examination Policy*. Report. Senate, McMaster University. April 9, 2014. Accessed October 30, 2017. <https://www.mcmaster.ca/policy/Students-AcademicStudies/UndergraduateExaminationsPolicy.pdf>

Exam Conflict Resolution

Principle: Information about exam schedules should be easily accessible to all students.

Concern: The process of exam conflict resolution is unclear.

Concern: Information about exam conflict resolution is not available with the exam timetable.

Recommendation: An alert should appear on exam timetables if there is a conflict within the schedule.

Recommendation: The Office of the Registrar should develop a standardized conflict resolution form to streamline the process.

Recommendation: This conflict resolution form should be available on the same page as the exam timetable to ensure accessibility.

Exam conflicts cause stress for the students experiencing them, particularly when the student is unaware of how to resolve the conflict. Resolution can be a daunting and often unnecessarily difficult task for students to accomplish. This unnecessary stress could be alleviated through an obvious alert on the exam timetable when conflicts arise. The alert should be accompanied by a standardized exam conflict resolution form that appears on this page. This is an accessible option to ensure students can have these conflicts resolved in a timely and effective manner. Similarly, this allows for the Registrar to become aware of conflicts as soon as they arise, providing them ample time to effectively solve the conflict. This system would streamline the process of exam conflict resolution in a manner, which will benefit students immensely.

Drop/Add Deadlines

Principle: Students should have the opportunity to make an informed decision about their course selection.

Principle: Students should receive communication about this Drop/Add policy and timeline, as it is relevant to their learning experience.

Concern: Many students are unaware of the Drop/Add Date.

Concern: The drop/add date is too early for students to make an informed decision about their course selection.

Recommendation: The drop/add date should be extended an extra week to allow students to coordinate or change classes.

Recommendation: All students should be sent an email that provides the Drop/Add date and outlines relevant processes.

The first week of class is a buffer period for students to receive a first glance at some of the courses that they have chosen to take. Not only do students use this period between the beginning of classes and the drop/add date to decide whether they like their classes, it can also be a time for students to switch into the that they initially wanted but could not register in due to seat availability. Most classes begin during the first week of September; however, some classes begin the following week due to scheduling. This can pose more of a challenge, as this does not give students enough time to “test-out” the classes they have selected when considering the drop/add deadline. Currently, McMaster’s drop/add deadline gives students a week after the sessional start date of the term to make decisions about their courses. However, this does not give enough time for students to make informed choices about their selections. McGill University gives students a two-week period after the start of classes to drop or add courses.¹⁸ This gives students who may have not had a chance to experience their courses due to scheduling an opportunity to do so. Beyond the drop/add period, students are also unaware of the formal dates. Much of the drop/add deadline information is shared through word-of-mouth. It would be beneficial if students could receive a University official email to inform students about this deadline. Current systems are inconsistent as it is up to the jurisdiction of professors to remind students. However, by creating a consistent platform, we can ensure that students are well aware of the drop/add period, which is crucial for course selection.

¹⁸ *Adding or Dropping Courses*. Report. McGill University. Accessed October 30, 2017. <http://www.mcgill.ca/students/courses/drop/adddrop>.

Accessibility

Ontario legislature requires McMaster University services to be accessible to all under the *Accessibility for Ontarians with Disabilities Act* (AODA)¹⁹, and the University has stated its commitment to “fostering, creating, and maintaining a barrier-free environment for all individuals.”²⁰ The following sections pertain to the interpretation of accessibility currently on the McMaster campus, with regard to the impact on academic success by inaccessibility of different varieties.

Podcasting Courses

Principle: Educators should communicate course material in accessible manners.

Concern: Some educators do not use available podcast technology.

Concern: Some students do not know about the availability of this technology.

Recommendation: Professors should be made explicitly aware whether or not they have the technology available to podcast their course. They should also be encouraged to obtain that technology personally or through the University.

Recommendation: Where the technology is available, educators should be required to audio record their lectures for online podcasts of the course.

Recommendation: Audio recording technology should be made more readily available to educators.

Recommendation: Podcast availability should be clearly communicated to students in every course.

Research has shown that lecture capture technology benefits student learning as well as provides an accessible format for students who are unable to attend classes.²¹ As the MSU believes that all students who are willing and driven to contribute should be able to, lecture capture technology, specifically podcasting technology, is of paramount importance. This has been a focus of the MSU for many terms now, and students repeatedly call for it during elections and referenda process, as can be

¹⁹ Government of Ontario. (2005). “Accessibility for Ontarians with Disabilities Act.” Retrieved from <https://www.ontario.ca/laws/statute/05a11>

²⁰ McMaster University. (2010). “McMaster University Policy on Accessibility.” (Hamilton, ON: McMaster University). Retrieved via <https://www.mcmaster.ca/policy/General/HR/Accessibility.pdf>.

²¹ Watt, S., Vajoczki, S., Voros, G., Vine, M.M., Fenton, N. & Tarkowski, J. (2014). Lecture Capture: An Effective Tool for Universal Instructional Design?. *Canadian Journal of Higher Education*, 44(2), 1–29. Retrieved October 20, 2017 from <https://www.learntechlib.org/p/157509/>.

referenced by the 2017–2018 Student Representative Assembly members' various platforms and year plans.²²

Podcast technology is a first step to Universal Instructional Design (UID) for McMaster University, where students are able to access education universally, rather than through various accommodations.²³ This can result in more students being involved in course material, better understanding of teaching styles and measures for peer evaluation between educators, and better, more proactive compliance to AODA legislation and values of accessibility. This approach to teaching and learning is valued at McMaster as per the current requirement for educators to participate in the “FLEX Forward” course on accessible pedagogies and universal instructional design.²⁴ While FLEX Forward is a new requirement for educators at McMaster, the program has the opportunity, and moreover, the responsibility, to making education universally accessible for our students.

Pedagogically, Universal Instructional Design are guided by the following principles summarized by Goff and Higbee:

(a) creating welcoming classrooms; (b) determining the essential components of a course; (c) communicating clear expectations; (d) providing constructive feedback; (e) exploring the use of natural supports for learning, including technology, to enhance opportunities for all learners; (f) designing teaching methods that consider diverse learning styles, abilities, ways of knowing, and previous experience and background knowledge; (g) creating multiple ways for students to demonstrate their knowledge; and (h) promoting interaction among and between faculty and students (11).²⁵

These principles may seem common sense to excellent teaching, but they communicate a broad yet focused value, specifically through principle (f). Podcast technology is but one pedagogical tool in Universal Instructional Design frameworks, but McMaster can communicate a value for all learning experiences by adopting the technology.

²² McMaster Students Union. “SRA Caucuses.” *McMaster Students Union*. Access date October 15, 2017. <https://www.msumcmaster.ca/governance/sra/sra-caucuses>

²³ Watt, S., Vajoczki, S., Voros, G., Vine, M.M., Fenton, N. & Tarkowski, J. (2014). Lecture Capture: An Effective Tool for Universal Instructional Design?. *Canadian Journal of Higher Education*, 44(2), 1–29. Retrieved October 20, 2017 from <https://www.learntechlib.org/p/157509/>.

²⁴ McMaster University. (2017). “Forward with Flexibility.” (Hamilton, ON: McMaster University. Access date October 12, 2017. <https://flexforward.pressbooks.com/>

²⁵ Jeanne L. Higbee, and Emily Goff. “Introduction,” *Pedagogy and Student Services for Institutional Transformation: Implementing Universal Design in Higher Education*, 2008. Accessed via <http://files.eric.ed.gov/fulltext/ED503835.pdf>

Physical Accessibility and Barriers

Principle: All students should be able to physically access their classroom.

Concern: Some classrooms are difficult to get to or are otherwise physically inaccessible (e.g. because of staircases).

Concern: McMaster campus is designed inaccessibly, putting students with physical disabilities (e.g. those who use a mobility device) at a disadvantage.

Recommendation: Accessibility of classrooms should be communicated on Mosaic during course registration, and on Avenue to Learn.

Recommendation: When new buildings are being planned, they should be designed with universal accessibility as priority.

Recommendation: Universal communication within the University should be prioritized rather than placing the responsibility on individual students.

The MSU's Accessibility Forum in 2015 determined that students feel that navigating the McMaster campus is difficult with a disability.²⁶ With this in mind, it is imperative that we recognize that this clearly indicates a disconnect between the McMaster University Accessibility Policy and the student experience of that accessibility. In order to mitigate the current inaccessibility of many buildings and rooms on campus, the University can prioritize universal communication about accessibility. This will also help with breaking the stigma around (dis)ability on campus.

The accessibility of classrooms should be communicated clearly to students upon registering for courses, so that requests may be made for classes to be moved if so needed, and for general preparation of all students. This should also occur during exams. Universal communication about these matters is crucial, as accessibility being prioritized should mean that individuals with accessibility concerns are not solely responsible for holding the University accountable to that value. It is clear that accessibility translates to academic success for all students, as the dismantling of barriers increases students' chances of learning, contributing, and collaborating.

²⁶ Vice President (Education). "MSU Accessibility Forum Report 2015-16: Breaking the Stigma." (Hamilton, ON: McMaster University, 2016).

Financial Accessibility

Principle: Students should not be placed at a disadvantage if they are unable to afford textbooks or tutoring, particularly those resources that are available similarly through less expensive, more accessible means.

Concern: Professors are unaware of or do not support Open Educational Resources such as fair-use articles and online textbook libraries

Concern: Tutoring services are often too expensive for students to benefit from.

Recommendation: Have a subsidized tutoring service available and promoted to students universally.

Recommendation: Educators should be encouraged to provide OERs wherever possible, and to consider financial accessibility a priority when choosing texts for courses.

The average tuition cost for Canadian full-time undergraduate students for the 2016/2017 academic year was \$6,373, a 2.8% from the previous academic year as reported by Statistics Canada.²⁷ In particular, Ontario universities had the highest average cost at \$8,114, with the next closest province almost a thousand dollars less costly. Additionally, additional compulsory (or ancillary) fees for Canadian students also saw a 2.9% in the 2016/2017 year from the previous year, with an average cost of \$873.

In a recent report released in April 2017 by Statistics Canada, it was reported that postsecondary enrolment rates among 19-year olds across all Canadian provinces have steadily been rising between 2001 to 2014.²⁸ The greatest increase was seen in the bottom income quintile, which saw a 9.4-percentage-point or 24.9% increase between 2001 (37.7%) and 2014 (47.1%). Despite the large increase, it is still noteworthy that the percent of top income quintile in 2014 had a substantial 78.8% enrolment rate, comparatively higher. Rising tuition costs present a financial barrier to this rising trend, in addition to the other accessibility issues that post-secondary students may currently face in Ontario.

Currently, the Government of Ontario is working towards improving student financial assistance to increase the accessibility and affordability of postsecondary education through the recent changes to the Ontario Student Assistance Program (OSAP).²⁹ Beginning this 2017/2018 school year, it introduced the Ontario Student Grant (OSG),

²⁷ Statistics Canada. "The Daily — Tuition Fees For Degree Programs, 2016/2017." 2017. <https://www.statcan.gc.ca/daily-quotidien/160907/dq160907a-eng.htm>.

²⁸ Statistics Canada. "Postsecondary Enrolment By Parental Income: Recent National And Provincial Trends." 2017. http://publications.gc.ca/collections/collection_2017/statcan/11-626-x/11-626-x2017070-eng.pdf.

²⁹ Ontario Ministry of Finance. "2016 Ontario Budget | Improving Access To Postsecondary Education." 2016. <https://www.fin.gov.on.ca/en/budget/ontariobudgets/2016/bk1.html>.

which aims to reduce the tuition costs of students with greatest financial need (family income of \$50,000 or less) by 100%. Under the new grant, the Ontario Government has committed to supporting over 50% of students from families with incomes less than or equal to \$83,000 through non-repayable grants that aim to cover average college/university tuition.³⁰ A recent article by the National Post reported that following the implementation of the new OSG, over 185,000 post-secondary students in Ontario have been awarded free tuition this year, equivalent to over 33% of all full-time college/university students in the province.³¹

While the recent governmental funding changes provide a promising option to those students whose families are ill-equipped to afford a full-time post-secondary degree, McMaster must explore other avenues to further reduce the increasing costs for all students, many of whom face additional costs in order to obtain a degree, such as transportation, housing, and food.

One such option is the use of open educational resources (OER), a free resource that utilizes a variety of online platforms, ranging from free textbooks to Youtube and TedTalks, to increase accessibility of learning tools for all students regardless of socioeconomic status.³² One of the greatest advantages of OER is the provision of a Creative Commons license to educators, which enables them to “adapt, adopt and remix materials” so that they can customize textbooks and other resources to the needs of their courses and their students.³³ In this way, not only does the use of OER allow for students to save money on the purchase of entire textbooks when they may only need a few chapters, it also enables instructors to easily structure their courses to maximize learning for students.

Since 2003, British Columbia has been actively promoting OER through its Open Education team at BCcampus, which manages the BC Open Textbook Project funded by the Ministry of Advanced Education, Skills & Training and the Hewlett Foundation.³⁴ As BCcampus states on its website, “The best represented benefit of Open is the way in which it enables student-centred learning. Modifying materials to better suit student needs and engaging in learning design that addresses individuals is essential for creating impactful learning experiences for students. Open brings improved access to learning materials and educational resources for students as well as instructors, with benefits beyond mere access.”³⁵ One of the primary goals listed for the open textbook development project is to decrease student costs and subsequently increase

³⁰ Ibid.

³¹ National Post. “So Far 185,000 Post-Secondary Students In Ontario Have Received Free Tuition.” 2017. <http://nationalpost.com/pmn/news-pmn/canada-news-pmn/so-far-185000-post-secondary-students-in-ontario-have-received-free-tuition>.

³² eCampus Ontario. “Open Educational Resources | eCampus Ontario.” 2017. <https://www.ecampusontario.ca/open-education-resources/>.

³³ Ibid.

³⁴ BCcampus. “Open Education | BCcampus.” 2017. <https://bccampus.ca/open-education/>.

³⁵ Ibid.

accessibility to education and learning. Between 2012–2017, it reported student savings of over \$3 million, with 221 books in the collection, 38 B.C. institutions currently adopting the use of OER, and almost 50,000 students utilizing these resources.³⁶

Despite the value of switching to OER for the purpose of increased educational accessibility, there are barriers to instructor uptake of these resources. A report by BCcampus explored the use of OER, including their motivations and perceptions, by post-secondary faculty in BC.³⁷ Their key findings suggest that “faculty at all types of institutions face institutional barriers such as lack of administrative, staff, or department support for their use of OER.” Many experts also believe that a lack of awareness may be one of the barriers towards the implementation of OER by educators, such as lack of understanding regarding the variety of licenses available through Creative Commons or the possibility for government and private grants to support the switch from traditional textbooks.^{38,39}

In Ontario, eCampus Ontario greatly support Open Education and boasts a multitude of educational resources that are open to students and educators for all post-secondary institutions in Ontario.⁴⁰ Their Open Textbook Library provides students with access to free, downloadable textbooks and other academic materials, thereby decreasing the costs associated with buying hard copies of traditional textbooks for students. Their Open Textbook Initiative, in partnership with the Ministry of Advanced Education and Skills Development, funded the development of “high-quality digital course content that can be freely reused, revised, adapted, remixed, redistributed, and retained by institutions to support online and technology-enabled teaching and learning.”⁴¹ Additionally, the Educational Technologies Sandbox enables its member institutions to explore and test new tools that support such teaching and learning, with current initiatives exploring the benefits of virtual reality labs, open badges, and experiential learning.⁴²

³⁶ BCcampus. “Open Textbook Stats | BCcampus Opened Resources.” 2017. <https://open.bccampus.ca/open-textbook-stats/>.

³⁷ Jhangiani, Rajiv S., Rebecca Pitt, Christina Hendricks, Jessie Key, and Clint Lalonde. “Exploring faculty use of open educational resources at British Columbia post-secondary institutions.” (2016).

³⁸ University Affairs. “The Open Educational Resources Movement Is Redefining The Concept Of Online Textbooks.” 2017. <http://www.universityaffairs.ca/features/feature-article/open-educational-resources-movement-redefining-concept-online-textbooks/>.

³⁹ Bates, Tony. “Teaching in a digital age.” (2015).

⁴⁰ eCampus Ontario. “Open Educational Resources | eCampus Ontario.” 2017. <https://www.ecampusontario.ca/open-education-resources/>.

⁴¹ Ibid.

⁴² eCampus Ontario. “EdTech Sandbox | eCampus Ontario.” 2017. <https://www.ecampusontario.ca/sandbox/>.

eCampus Ontario also has several funding initiatives in place to support Ontario educators towards improving technology-enabled teaching and learning, including the New Program Development Fund, the Research and Innovation Fund, and the Open Initiatives Fund.⁴³ For instance, the New Program Development Fund has enabled educators to design online programs tailored to the needs of their students. This has not only allowed them to work towards improving the quality of education being provided to students, but has also further enabled students to access free or low-cost OER.

Many institutions across Canada, like those in B.C., have begun to transition towards the use of OER. University of Toronto began its Zero-to Low Cost Course Project in the Spring 2015 term and reports savings above \$400,000 for students thus far.⁴⁴ (13) With progress seen across Canada, it is time that McMaster explore partnership opportunities with organizations like eCampus Ontario and work towards better awareness of open education and integrating the use of OER into all courses moving forward. The benefits for both faculty and students have been shown. To overcome the barrier of limited faculty uptake, McMaster should work with professors to increase their understanding of the benefits of OER for their students and themselves and further support them in developing online textbooks and resources best tailored to their courses. If instructors were given adequate knowledge and support in the transition to OER, it might go a long way towards incentivizing them towards better teaching and learning. By decreasing costs of attending post-secondary education through the implementation of OER, McMaster will further open its doors to the brightest minds across Canada and internationally.

⁴³ eCampus Ontario. "Educator Resources | eCampus Ontario." 2017.
<https://www.ecampusontario.ca/educators/>

⁴⁴ University of Toronto Libraries. "Zero-To-Low Cost Course Project." 2017.
<https://onesearch.library.utoronto.ca/copyright/services/ztlcc>.

Academic Resources

Principle: Students should have easy access to all of the academic resources necessary to succeed; including, but not limited to: academic advisement, academic services, and trained undergraduate teaching assistants.

Concern: Students find it difficult to seek academic advisement due to limited drop-in hours during the academic year.

Concern: Some students are unaware of the Academic Services available to them.

Concern: Students rate their Teaching Assistants as only average, citing variations from TA to TA as the reason for this rating.

Recommendation: The University should propose that Academic Advisement Offices extend their office hours during peak periods of the academic year.

Recommendation: The University should create a widget on Mosaic or Avenue to Learn to advertise Academic Services in one centralized location to students.

Recommendation: The University should create a Training Facilitation Guide and implement training for all Undergraduate Teaching Assistants, possibly in collaboration with the Paul R. MacPherson Institute for Leadership.

Some students are unaware of the academic services provided by the university. Respondents of the 2017 Academic Services Poll indicated their use of some academic services: Academic Workshops (9%), Tutoring Service (8%), and Writing Workshop (1%).⁴⁵ The Report suggests a lack of effective promotion as a potential cause for this lack of awareness. A centralized location to advertise Academic Services would be beneficial, such as Mosaic or Avenue to Learn, as most students visit these sites frequently.

Teaching Assistants (TA's) are a core component of the classroom experience.⁴⁶ As such, the overall effectiveness of TA's may impact student academic performance. As per the 2017 Academic Services Review, most students rate their satisfaction with TA's between 2-4, with the most responses for 3, indicating that most students felt their TA's were around average effectiveness.⁴⁷ The implementation of a mandatory Undergraduate Teaching Assistant Training Program would provide all TA's with the necessary teaching, communication and facilitation skills required to succeed in such a role. Respondents of the 2017 Academic Services Poll believe TA's could improve their teaching style (66%), communication with students (59%), and classroom facilitation (56%).⁴⁸ Other universities, such as the University of Western Ontario, have benefitted

⁴⁵ Hsu, Megan. *University Affairs Report: Academic Services Review*. 5-6. (Hamilton: McMaster Students Union, 2017.)

⁴⁶ Hsu, *Academic Services Review*, 10.

⁴⁷ Hsu, *Academic Services Review*, 10-11.

⁴⁸ Hsu. *Academic Services Review*, 11.

from the implementation of such a program, citing their seminar-workshop based program for their success with effective TAs.⁴⁹

Academic advisement enables students to realize their maximum educational potential.⁵⁰ Consultations with academic advisors may provide students with assistance in course selection/registration, preparation for post-degree endeavors, accessibility accommodation, etc.⁵¹ With the current Academic Advisement Office drop-in hours, students are finding it difficult to meet with their respective academic advisors. Three of the largest faculties on campus, the Faculty of Science, Faculty of Engineering, and Faculty of Social Science, had drop-in time to student ratios of 0.10 hours/student, 0.06 hours/student, and 0.07 hours/student respectively. This equates to 6 or less minutes per student per academic year (Fall and Winter sessions).

⁴⁹ University of Western Ontario. *TATP – Teaching Assistant Training Program*.
https://www.uwo.ca/tsc/graduate_student_programs/tatp.html.

⁵⁰ University of British Columbia. *What is Academic Advising?*.
http://students.ok.ubc.ca/advising/what_is_advising.html.

⁵¹ McMaster University. *Student Affairs – Academic Advising*.
<http://studentaffairs.mcmaster.ca/academic-advising/>.

Classroom Learning Experiential Education

Principle: Integrating experiential learning opportunities into content courses promotes student-centred learning and enriches academic inquiry.

Concern: There is a lack of experiential learning components in new and existing courses.

Concern: There is a lack of service-learning courses offered across faculties.

Recommendation: The University should create an institutional vision and mission to promote experiential learning.

Recommendation: The University should incorporate experiential education into new courses and course outlines of existing courses.

Recommendation: The University should hold a best practices workshop in partnership with McPherson Institute concentrating on providing faculty with essential skills that an instructor might need.

Often misunderstood, experiential learning is defined as students engaged in learning content in which they have a personal interest, need, or want.⁵² They found that most college faculty members teach by lecturing because few have learned other ways to teach. Although traditional lecturing styles are important in the delivery of education, teaching approaches that focus on student discussions, group work, and hands-on participation within and outside the classroom should be explored. These teaching approaches can be vaguely categorized under experiential education, which prioritizes the learning process rather than the outcome. The MSU is concerned with the lack of experiential education components in new and existing courses at McMaster University. The implementation of experiential education in higher education can be achieved through the creation of learning spaces that promote growth-producing experiences for learners.⁵³ These learning spaces include apprenticeships, clinical placements, cooperative education, fellowships, fieldwork experiences, internships, practicum experiences, student teaching experiences, service learning, and volunteer opportunities. Service learning and volunteer opportunities can be easily integrated into existing courses and is a mutually beneficial relationship for the student and the community. This would allow students to engage with the city of Hamilton, learn about

⁵² Wurdinger, Scott D., and Julie Carlson. *Teaching for experiential learning: five approaches that work*. New Delhi: Overleaf, 2011.

⁵³ Kolb, Alice Y., and David A. Kolb. "Learning Styles and Learning Spaces: Enhancing Experiential Learning in Higher Education." *Academy of Management Learning & Education* 4, no. 2 (2005): 193-212.

their surroundings, and develop good citizenship.⁵⁴ Educators are encouraged to read the list of experiential learning principles outlined by the Association for Experiential Education. To implement experiential learning effectively, a holistic program that includes development in all institutional developments will prove to be the most effective.⁵⁵ The MSU recommends the development of an institutional vision and mission to promote experiential learning that provides guidelines for educators and applies practices to new and existing courses from all faculties. The information regarding best practices of experiential education and teaching can be disseminated to educators through workshops in partnership with McPherson Institute.

Pedagogical Best Practices

Academic concerns make up a huge portion of the student body at McMaster University. It is essential that The McMaster Student Union dedicate efforts to not only point out major concerns that students have regarding their academics but also recommend solutions that have worked in the past with other universities.

Innovative Course Design

Principle: Pedagogical research should be consulted when designing and delivering course content.

Concern: New courses incorporating blended learning are often variant in what blended learning means.

Concern: Blended learning adds additional hours of class onto a student's schedule

Recommendation: Hold a teaching best practices workshop in partnership with MacPherson Institute concentrating on providing faculty with essential skills that an instructor might need.

Recommendation: Form an expert committee that will advise instructors switching over to inquiry/blended learning

Innovation in education is essential in order to improve the quality of education given to students. Currently, McMaster incorporates many new tools and techniques in order to teach students. These strategies such as inquiry and blended learning are well researched, however, improper implementation of such designs can result in course difficulties.

⁵⁴ Bringle, Robert G., and Julie A. Hatcher. "Implementing Service Learning in Higher Education." *The Journal of Higher Education* 67, no. 2 (1996): 221-39.

⁵⁵ Kolb, Alice Y., and David A. Kolb.

For this very reason, The McMaster Student's Union conducted a university-wide academic services review⁵⁶. The review found that the majority of concerns that students were having surround the style of education specifically blended learning and inquiry. Blended learning is a combination of online modules, in person lectures as well as self-directed learning. However, students at McMaster found that the quality of blended learning varies from course to course and faculty to faculty. This is a surprising finding as there is an institution dedicated to improving education at McMaster.

In order to reduce the variability between and within faculties, McMaster University can create a committee that works specifically on innovation in courses. Currently, University of British Columbia has a task force that is responsible for blended learning.⁵⁷ It provides a comprehensive definition of what blended learning is and also provides guidance and feedback for instructors planning to switch over. In addition to helping with the transition, the task force checks the progress of the course and evaluates the switch to blended learning. Additionally, the university also hosts sessions for instructors switching to blended learning. The sessions are a 4 week long blended learning course where instructors experience blended learning first-hand whilst learning on how the process of switching over occurs and what it entails.

McMaster University currently has a body of researchers dedicated to research on classroom innovation known as the MacPherson Institute. The institute in collaboration with students and faculty can combine to create such a committee. Having this committee as advisors will help control variability in blended learning and inquiry across different faculties. In addition, the committee can work towards creating information sessions for instructors who want to convert their courses to blended learning or inquiry based.

Testing

Principle: Course testing should concentrate on student learning rather than just evaluation.

Concern: Students are tested on high-risk summative assignments and lack access to feedback from instructors.

⁵⁶ Hsu, Megan. *University Affairs Report: Academic Services Review*. (Hamilton: McMaster Students Union, 2017).

⁵⁷ "Teaching in a Blended Learning Environment (T-BLE)," *Centre for Teaching Learning and Technology*, accessed October 27, 2017, <https://ctl.ubc.ca/programs/all-our-programs/tble/>.

Recommendation: Incorporate more formative testing assignments.

Currently, McMaster focuses on using tests as a means of evaluating how a student is doing in the course.⁵⁸ Alternatively, assessments can be used facilitate learning itself. By incorporating more formative tests instead of summative tests, instructors can provide students with constant feedback on their learning. A study done at Queen's University aimed to look into the benefits of such testing in a post-secondary environment. This online formative feedback survey allowed students to receive feedback throughout the course rather than just after a largely weighted midterm/exam. Students reported improved learning and better support from faculty.⁵⁹ McMaster University should aim to follow this model and introduce formative assessments into courses. These smaller scale assignments will provide students with more learning opportunities and allow them to understand the expectations of the instructor.

Content Delivery

Principle: Lectures should be interactive and engaging.

Concern: Large class sizes result in non-interactive lectures

Recommendation: Instructors should incorporate innovative methods that make lectures more interactive (e.g. active learning, problem-based learning, iclickers, inquiry based learning).

Recommendation: Instructors should incorporate small tutorials for courses with large class sizes

The way a lecture is delivered can have major impact on student engagement and sometimes even retention. This is especially apparent in large first year courses where class sizes exceed 500 students. Most students are entering post-secondary

⁵⁸ Wai, Jai et al, "Teaching and Assessment," *Ontario Undergraduate Student Alliance*, last modified 2015, https://d3n8a8pro7vhmx.cloudfront.net/ousa/pages/33/attachments/original/1473368013/Teaching_and_Assessment_document.pdf?1473368013.

⁵⁹ Miller, Tess. "Formative computer-based assessment in higher education: The effectiveness of feedback in supporting student learning." *Assessment & Evaluation in Higher Education* 34, no. 2 (2009): 181-192.

institutions from a small class size of 20 to 30 individuals, having them attend lectures that a large and non-interactive can negatively affect their transition into university.⁶⁰ As a result, McMaster should aim to make large lecture classes more interactive through the incorporation of various techniques that promote collaborative learning and by offering smaller scale study groups within the large lecture hall.

One such technique involves *Active learning* where instructors incorporate activities into the course that allow students to think about what they are learning. This can be done on several scales and has proven to be successful in some courses at McMaster. On a very small scale, active learning can involve professors asking students to think, pair and share with the individual beside them. This small activity can occur in the middle of lecture for a couple of minutes without disrupting the “traditional” way professors usually teach.⁶¹ This has been done at McMaster University in Introductory Psychology lectures with the use of iclickers. The lectures require individuals to stop and answer a question mid-lecture. At first, the students answer it alone and then are provided with the opportunity to speak to their peers. The university should encourage other courses to incorporate similar forms of active learning as a step into more engaging lectures.

In addition to these smaller scale changes in classrooms, instructors can also add more opportunities for learning by engaging with the content in innovative ways: this can be done by incorporating teaching innovations such as *problem-based learning*. PBL is a technique that involves students learning course content by actively exploring a problem or challenge they are presented with.⁶² The use of PBL in classrooms has shown to be effective especially in the field of nursing in Canada. Studies have shown that PBL allows students to gain a deeper level understanding of content than regular styles of teaching.⁶³ Currently, McMaster has incorporated forms of problem-based learning in its health sciences department to help teach future doctors, therapists and nurses how to actively learn concepts while solving problems presented to them in small-scale groups. Other instructors at McMaster can also follow this paradigm and shift towards creating courses that allow students to engage actively with the content.

⁶⁰ Kuh, George D., Ty M. Cruce, Rick Shoup, Jillian Kinzie, and Robert M. Gonyea. "Unmasking the effects of student engagement on first-year college grades and persistence." *The journal of higher education* 79, no. 5 (2008): 540-563.

⁶¹ Ibid.

⁶² Choi, HeeJung. "The effects of PBL (Problem-Based Learning) on the metacognition, critical thinking, and problem solving process of nursing students." *Journal of Korean Academy of Nursing* 34, no. 5 (2004): 712-721

⁶³ Ibid.
