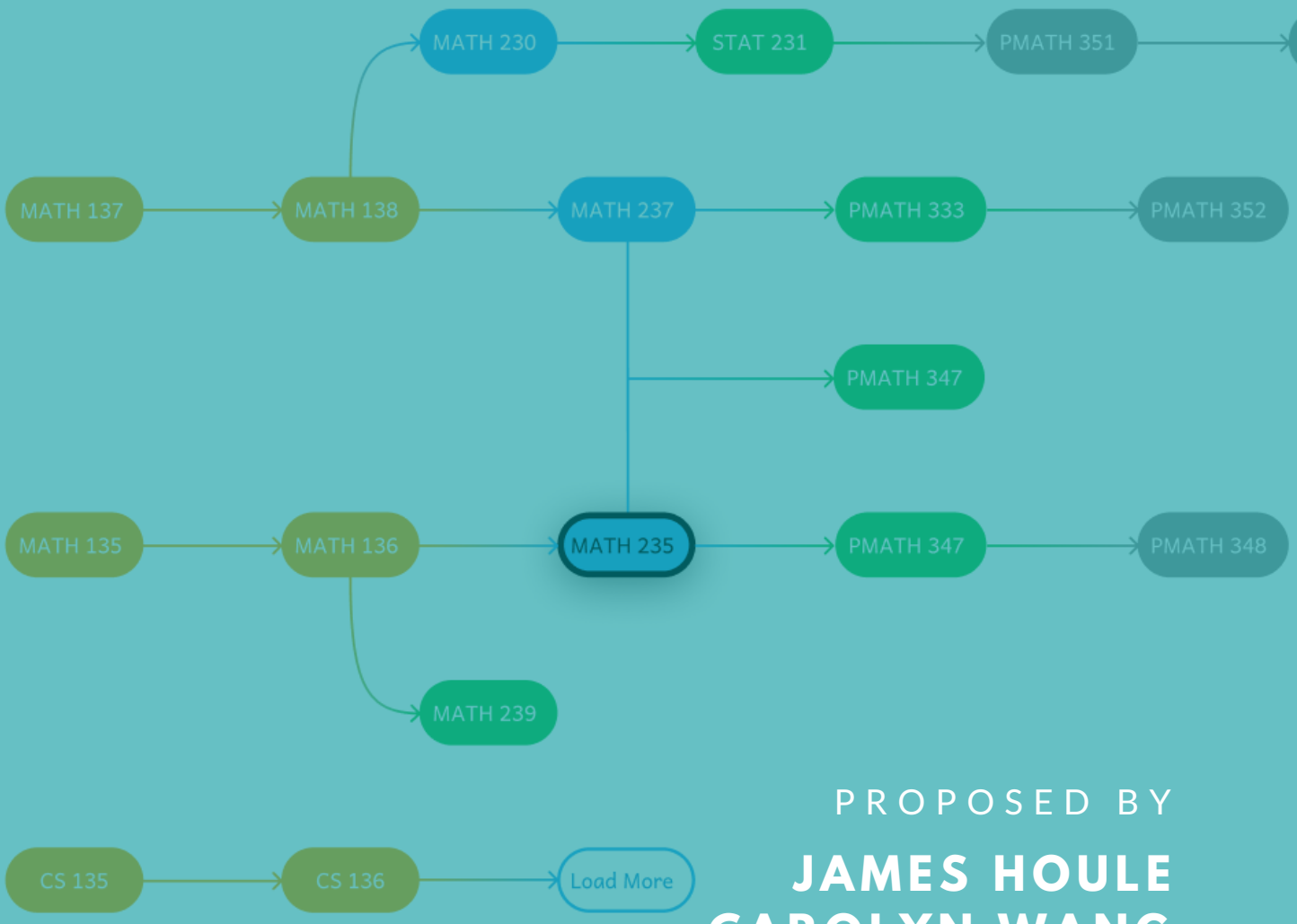
THE UW

SCHEMATH

IMPROVING THE COURSE SELECTION PROCESS FOR STUDENTS



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ABSTRACT

COURSE SELECTING AT UW IS DIFFICULT

With the difficulties of the current course selection process, the University student life at Waterloo can be tedious and potentially derailed. This is enforced by the fact that samples of students from the UWaterloo ENGL 119 class itself shows that many students find using UWflow, Quest and the UW undergrad calendar to be inconvenient and overly-complicated. Further research shows that of the same students that used course planning software in high school, such as myBlueprint, would greatly prefer having a more updated course planning software. Thus, the University of Waterloo could use a strong update to the convenience and aesthetics of its online resources for student academics planning. This is what Team ScheMATH is offering. Carolyn Wang, James Houle, Evan Yu, Zhongchi (Leo) Li, Yunseo Jang, and William Chan have developed a new and improved course planning software, ScheMATH. ScheMATH was designed to be accessible, user friendly, and informative, with a visual course map designed to help students plan their university careers.

BACKGROUND

When a highschool student graduates and proceeds to post-secondary education, they are granted many freedoms. While this freedom is often seen as exciting and libreating, it can also be detrimental to the student at times. Suddenly, nobody tells them what to do anymore.

This can be especially dangerous when it comes to university course selection. If the student is not informed of a missing course, or they haven't taken a class they were supposed to in a given semester, the student's undergraduate career may encounter unwanted roadblocks. For instance, if a fourth year student realizes that they had forgotten to take one of their mandatory classes, they will be forced to extend their studies by an extra term to take the class that they missed.

Students can obtain course selection information from either their academic advisor, or by accessing the various online resources. However, through a survey conducted on a group of undergraduate students from the Math Faculty (An ENGL 119 class), most students rarely meet with their academic advisors (Figure 1).

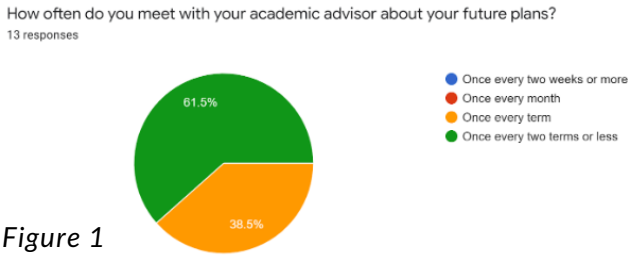


Figure 1

In addition, the way students are to select their courses is separate from the online resources for course information available to students which makes the resources seem inaccessible (Figure 2).

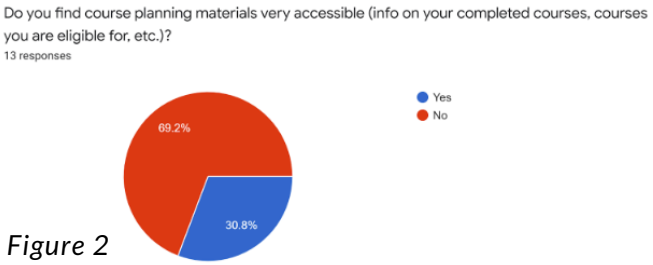


Figure 2

Some highschools use softwares such as myBlueprint that solve all of these problems regarding course selection (Figure 3). Based on the aforementioned survey, it is evident that most students would prefer a software similar to myBlueprint over the resources currently available to them (Figure 4).

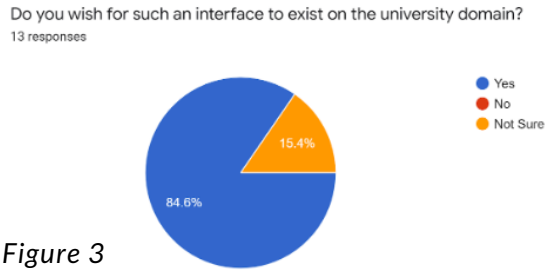


Figure 3

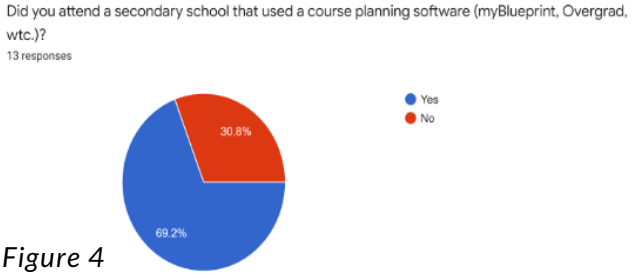


Figure 4

This is why we, Team ScheMATH, have developed a solution.

FUNCTIONALITY

Team ScheMATH offers a user friendly platform for students to plan out their post secondary education. The website's modern and simplistic design ensures that students are only clicks away from visualizing their future course plan.

The ScheMATH website features four main subpages:

- Home
- Course Selection
- Course Map
- Planner

HOME

The home page is a welcoming landing page for all the functionalities included in the website. It features a slideshow giving reminders of important dates, links to helpful tools and websites to give students some quick and useful information, and provides help to the ones that need it. From the home page, the user can navigate to the various services offered by the application.

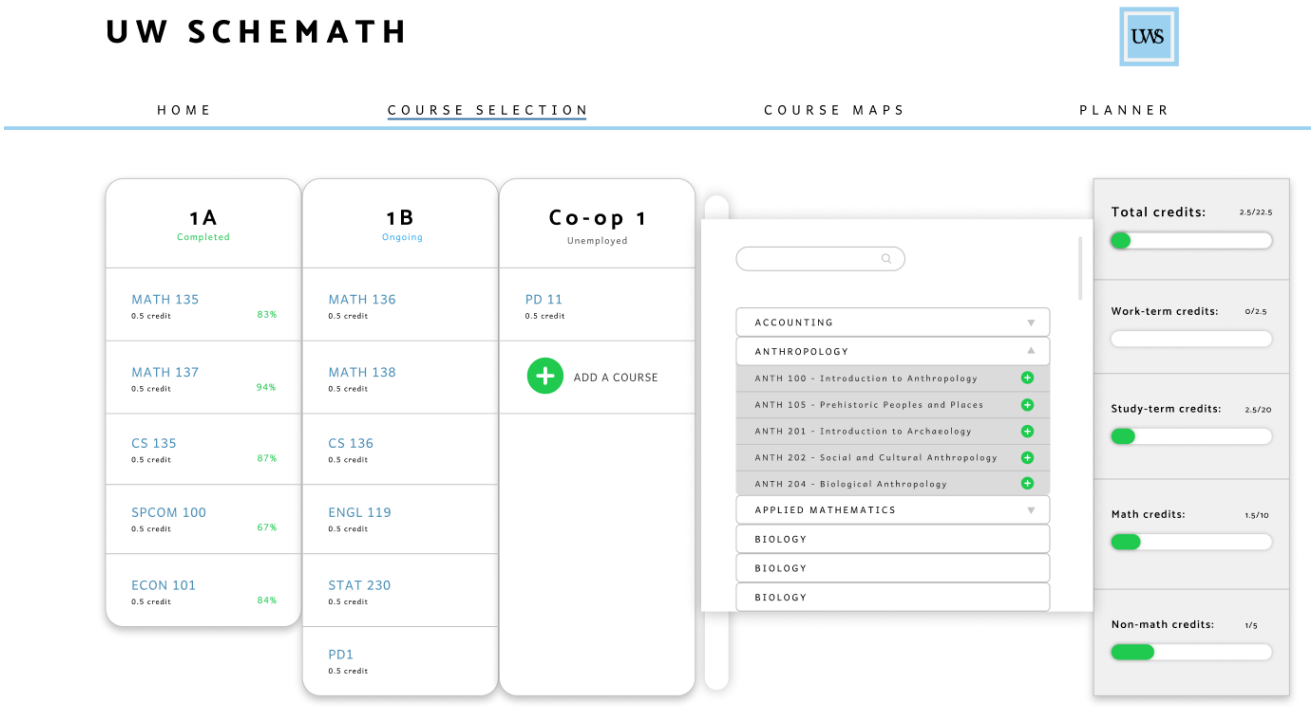
FUNCTIONALITY

COURSE SELECTION

The course selection page comes in the form of an enhanced template inspired by myBlueprint. It features a simple yet elegant design, with clear vertical ‘term-bars’ showing information about each term. It includes lists of all the courses the students have taken/are taking in that term and the course’s corresponding credit points and the student’s grade if available.

On the right hand side of the page, progress bars are neatly stacked to show the student’s progress towards his/her degree, giving students a clear idea of how much they’ve succeeded and how much they have to do. ScheMath, however, offers more than myBlueprint, as university life is more complicated than secondary school life. myBlueprint may have elegant course selection processing, but it seems to still be lacking when students wish to explore different classes and fails to provide educational opportunities in this way. ScheMath will have an up-to-date database of courses that will be displayed in a user-friendly way, which will be discussed in the next section.

During the course selection period, the term in which the students are currently enrolled will become available for students to add courses. When the green “Add course” button clicked, an overlay with a useful search bar and all the courses neatly sorted in a toggled list of categories will appear. The overlay is easy to navigate and provides students with a quick and clean course selection experience.



FUNCTIONALITY

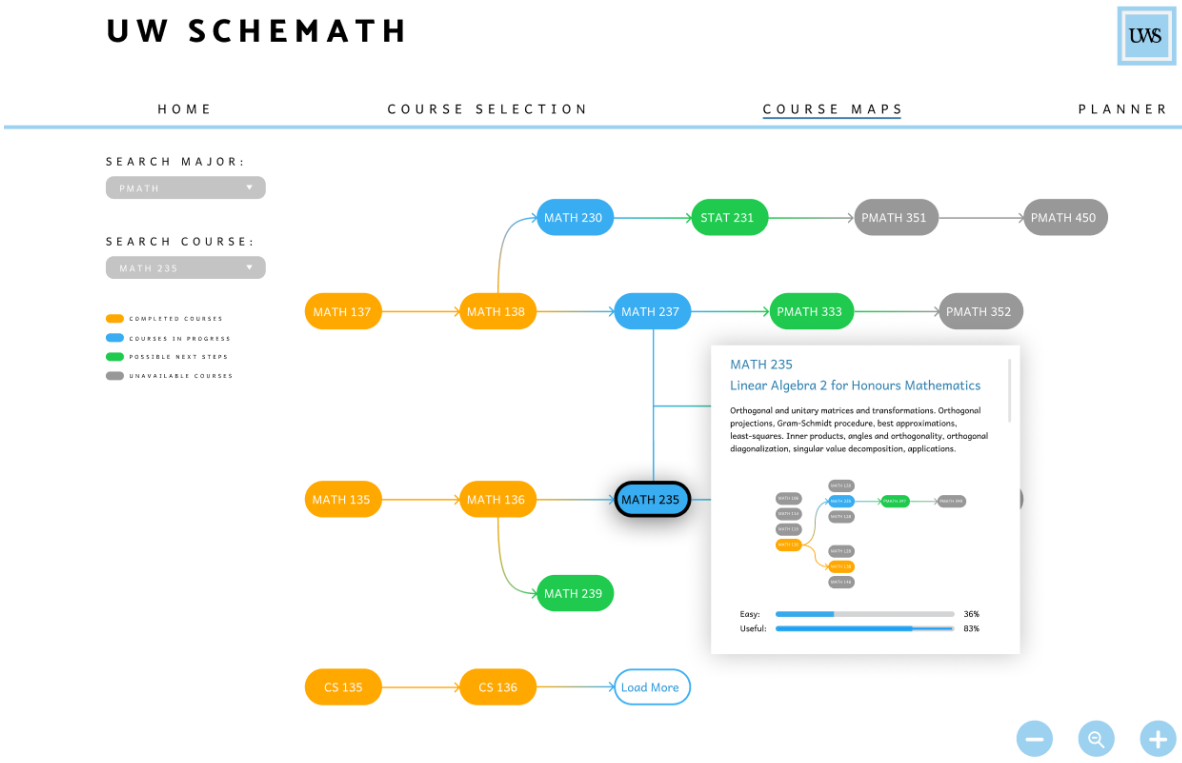
COURSE MAPS

The Course Map page shows the student the progression of courses that they will need to take in order to fulfill their graduation requirements. These maps take into consideration pre and antirequisite courses and display them in a way such that, if followed, the student will graduate on time.

The maps also consider the student's past and current courses, highlighting them in distinct colours: a course is highlighted as follows to show the information graphically:

- Yellow indicates that the credit has been earned
- Blue indicates that the student is currently enrolled in the course
- Green indicates that the course is available for the student to enroll in
- Grey indicates that further prerequisites must be taken prior to enrollment

The page also contains a search bar for students to search for specific courses in the maps included in their indicated major. To view a short description of the courses, students will only have to click the course code, and an overlay will appear, displaying a description, easiness, usefulness, and much more.



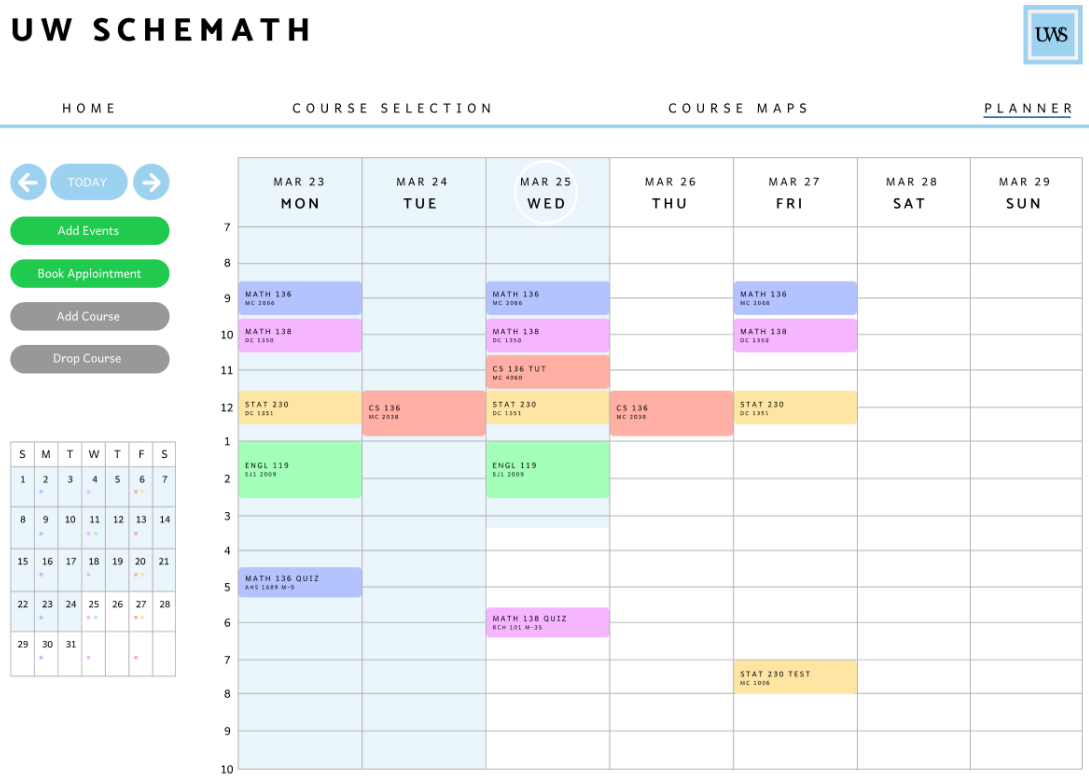
FUNCTIONALITY

PLANNER

The planner page features a current time table of the student, displaying the student's courses and locations. Students can choose to add their own events and plan their outside-of-class time as they wish. There is also a small monthly calendar with colour coded dots indicating project and assignment deadlines for each course.

Both components include a light blue shade that is a live indicator of the parts of the calendar that has been passed.

The primary purpose of the planner page is for course swapping. Once the school releases the student's initial course schedule, this page will help the students optimize their swaps to accommodate their preferences for lecturers and times. Initially, this page displays the student's current time schedule in weekly calendar form. If the user intends to add a course, the page will return all the lecture sections that do not conflict with their current schedule. Once the user makes their final decision to add or drop a course, the calendar will immediately update to demonstrate the impact of the action.



AUDIENCE

The initial goal is to develop ScheMATH for the Bachelor's of Pure Mathematics program at the University of Waterloo. Course planning is a difficult problem for students to solve individually, as they must consider options, minors, and specializations, all of which can vary greatly from each individual student and department. Once the framework and architecture of the application is established, we hope to scale it so that the service can be offered faculty, and later, school wide, and eventually to other universities that may find it useful as well.

PLAN

We plan on attaining information straight from the audience via a class-wide survey. In conjunction with relevant articles on post-secondary education (For example, Vasseur's CAPRES report on post-secondary education), the survey will paint a picture on the current messy course selection progress by asking relatable but calculated questions towards students to maximize understanding and progress between our team and the students. Questions that ask about our interface, our planned annual process for updating our database, and so on. We estimate to be finished collecting data through this survey in one week. We also plan on looking to other education planning software to find what needs improvement in our own course selection process.

Our website will be implemented in a three stage process. Firstly, we will develop an algorithm to extract all the relevant information from UWaterloo's undergraduate calendar. This information will be used to construct the course mapping and the course selection feature. Next, we will develop a scheduling algorithm to help implement the course planning feature. Finally, we will combine all the features to build the user interface. Starting development on the 19th of February, we expect to have completed a stable release version by April 19th. We show a more detailed Gantt chart below (Figure 5).

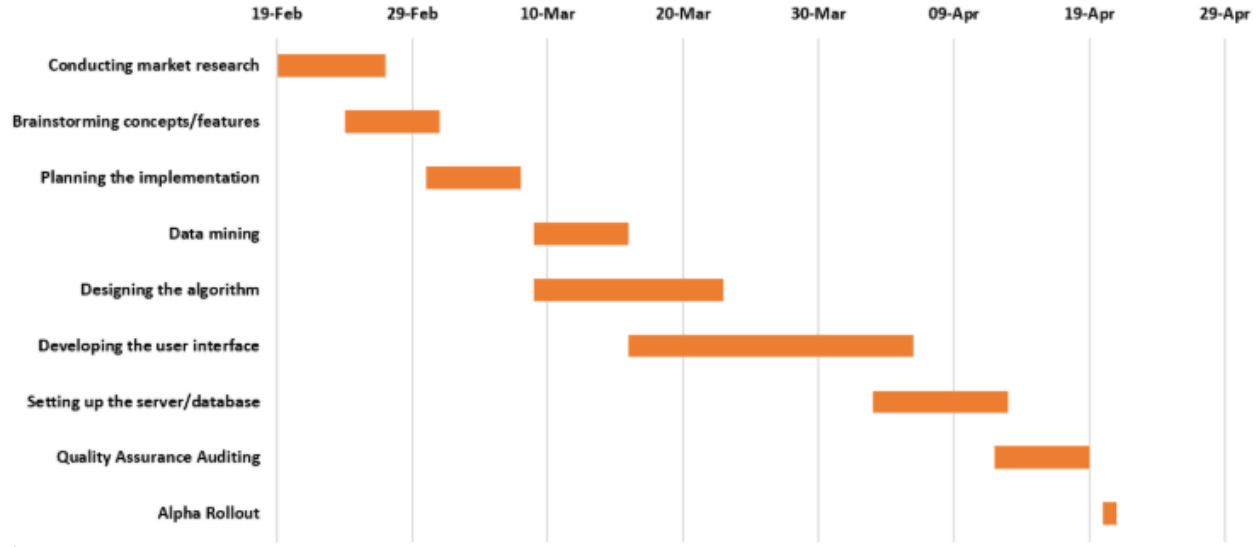


Figure 5

CONCLUSION

The implementation of ScheMATH as a new course planning tool would be very beneficial to students and the University in improving the course selection experience, consequently bettering mental health and providing financial benefit for the University as well.

Firstly, ScheMATH will help students better organize their time in both the short and long term (using the course planning and course mapping functions respectively), which in turn reduces their stress and increases their motivation levels. Lower stress levels have been proven to have a positive impact on one's health in general, and in particular, on one's mental health (Schonfeld, Brialovskaia, Bieda, Zhang, & Margraf, 2016). While this on its own is already a very substantial benefit, it also means that the demand for mental health support from the University will decrease, potentially allowing for higher quality service and reduced spending on this resource.

Having more accessible information on one's educational path also means less confusion surrounding graduation requirements, which may well result in reduced burdens on academic advisors, which may also have financial benefits to the University.

The course mapping, planning, and selecting services that ScheMATH would offer to students are unprecedented improvements upon the current system that we believe will have invaluable benefits to both students and the University for a relatively low cost. We would greatly appreciate your support so that we have the resources we need to implement this exciting project.

REFERENCES

Vasseur, François (2015), CAPRES Report – Ways of Enhancing Postsecondary Persistence and Success, Quebec City, CAPRES. From the CAPRES website: http://www.capres.ca/dossiers/despistes-pour-accroitre-la-reussite-et-la-perseverance-a-leducation-superieure/

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