Milestone 1: User Research and Requirements

October 1 2024

Part (a): Project Idea

Our goal is to improve the user experience when selecting courses for a given term. Currently, when enrolling in classes with MyTimetable through Mosaic, a user has no way of seeing their required courses to graduate. We plan to improve this experience by adding an academic planner to MyTimetable. With this enhanced web page, students will be able to see and plan their required courses for the future, all while selecting their courses for the current term.

To use our system, users can search through all of the courses that McMaster has to offer, and enroll in the courses that they have permission to be in. They can select a course to add it to their schedule for the current year, or add it to their plan for future years. All courses have descriptions, prerequisites, anti-requisites, and amount of seats available. Users can view their program requirements.

This system will be used by university students planning and enrolling in their courses for their upcoming semesters. This can be a stressful time, especially for new students. The users could also be in a rush, as they will want to enroll in all of their courses before they fill up.

Part (b): Identify Stakeholders

Primary Users: Undergraduate Students

Undergraduate students make up the bulk of a university's student population and will most likely be selecting courses every term. They must have completed secondary school or an equivalent and as such should be familiar with some aspects of course selection (required courses, electives, prerequisites ect.). First-year students may be experiencing courses with distinct parts (lecture, tutorial, lab) for the first time. On average undergraduate students are 17-25 years of age[1]. Due to their age and the integration of online components into secondary school classes, undergraduate students are likely to have extensive experience with web browsing.

Secondary Users: Graduate Students

Graduate students must have completed an undergraduate degree and therefore will have made university course selections in the past. They may not be enrolling in classes each term like undergraduates if their program requires time in a research position or submitting a thesis. On average graduate students are 25-35 years of age[1]. Due to their age and level of education they

[1] Based on data collected from post-secondary graduates residing in Ontario in 2020 [Statistics Canada]

should be familiar with web browsing. They may have completed their undergraduate degree at a different institution with a different system for enrolling in courses so we cannot assume graduate students will be familiar with this interface specifically.

Tertiary Stakeholders: Department Chairs

Among other administrative duties, department chairs are responsible for scheduling courses, assigning faculty to teach those courses, and overseeing curriculum development. As such they are the source of a great deal of the information our interface seeks to communicate to users. Approximately 95% of university faculty members hold doctoral degrees and they are on average 40-60 years old[2]. Department chairs have generally been with a university for many years and as such will be very well versed in the school's administrative systems.

Tertiary Stakeholders: Professors

The courses professors are asked to teach may change depending on enrollment numbers which may in turn be affected by the design of the enrollment interface (ie. if electives are displayed alphabetically, anthropology may see disproportionate enrollment as compared to sociology simply because students see it first). Approximately 95% of university faculty members hold doctoral degrees and they are on average 40-60 years old[2].

Part (c): User Research

Shadowing

It is important that we get a view of user habits that is as objective as possible to avoid changes that will hamper an existing user's experience. Additionally, since students enroll in courses at most once each term, their recall of using the enrollment platform may be inaccurate or lacking in detail. Direct observation allows for a greater degree of certainty than relying on memory.

We asked a 4th year Actuary student to act as they would to enroll in courses for next year and took notes on their behavior. The first thing we noticed is that they quickly left the enrollment page entirely to consult external resources about the requirements for their program. Once they knew which courses they would be taking they made use of the search bar on the enrollment page to quickly find and select their courses. The process of enrolling in a course was relatively simple and efficient, once the student knew the name of the course they needed. Determining which courses to take and what they were called was the obvious sticking point because that process necessitated sorting through multiple external websites, as the enrollment page itself did not readily provide any information.

[2] Based on data from the McMaster Fact Book [2022/2023 McMaster Fact Book]

Narration

We chose the narration method to complement our shadowing. While shadowing gives insight into what a user does with the tools currently available to them, there is no way for us to understand their feelings or thought processes about those tools. This is important within our context because enrolling in courses is something students cannot avoid doing and must use their school's specific interface to do. Students may use features and workarounds they find irritating or unpleasant because there is no alternative to accomplish the task.

We asked a 4th year Biology and Chemistry co-op student to act as they would to enroll in courses for next year and describe aloud their thoughts and actions. We transcribed their narration and reviewed it afterwards to understand their experience. The student expressed confusion and frustration while looking for the requirements for their program, remarking:

> *"I think I can see that on Mosaic but I don't know where. I know it was on Mosaic before. I still need one course of level four Biochemistry and I'm clicking on 'View Course List' to find a course that satisfies that requirement. Unfortunately, Mosaic will not tell me how many courses I need to complete my concurrent certificate, so I have to track that separately on another application."*

Much like the subject of our shadowing research, the majority of this student's time enrolling was spent in other tabs looking for information. They didn't express any particular preference for the organization or design of the external sites they used, overall the student's narration gave the impression that switching between tabs was tedious and irritating to them.

Semi-Structured Interviewing

Both shadowing and narration place focus on a user's specific in-the-moment relationship to existing systems. Neither method explores their retrospective thoughts or ideas for additive improvements. To fill this gap we conducted a semi-structured interview with a 4th year Math and Computer Science student.

The student told us they enjoy using the interactive schedule central to the current MyTimetable interface and the existing course details display. Consistent with our other research, the interviewee reported a desire for the integration of program-specific academic planning tools, to save time searching external resources. According to this user, effectiveness, safety, and efficiency are most important when enrolling in courses. Additionally, they liked MyTimetable's feature allowing students to save multiple schedules under "Favourites", to compare and pick from later on.

Part (d): Requirements

Functional

Must Have	Should Have	Could Have
The system must allow users to enroll in courses. This is the fundamental purpose of the product.	The system should give users information on their program requirements. The most common issue with the current system we encountered during user research was the difficulty of locating this information.	The system could display the number of seats available. This provides students with more freedom in when they want to enroll
The system must show users all courses being offered in a given term. If courses are inaccessible to users no one can enroll in them and therefore the course cannot run.		

Data

Must Have	Should Have	Could Have
The system needs to access course details from the school. So students have course information to build a schedule.	The system should store programs' course requirements. To address the common issue of students not knowing what courses are required to graduate.	The system could store enrollment data from previous years, aggregated by program, to create course recommendations While conducting user research we noticed some students using sites like Reddit to check what others in their program had taken in the past.
The system needs to store what courses a user is currently enrolled in. Students should not accidentally enroll in a course twice.		

Environmental

Must Have	Should Have	Could Have
The system must operate on any modern web browser. This is how students will connect to the interface.		Mobile browsing. Some students are more comfortable with phones than computers.

User

Must Have	Should Have	Could Have
The system must be compatible with accessibility tools such as screen readers. Under Canadian law educational institutions are disallowed from discrimination on the basis of ability[3]. As all students are expected to use this interface, it must be operable for those with visual impairments.	The system should provide instructions accessible through a "Help" button or similar feature. The nature of this product means even the most frequent users are likely to go several months between uses. For this reason quick access to information that may have been forgotten would be beneficial.	FAQ Section Users with little experience enrolling in classes may struggle using this software for the first time. A FAQ section would answer their questions and steer them in the right direction.

Usability

Must Have	Should Have	Could Have
The system must only allow students to enroll in courses they are eligible for (seats available, program, prerequisites fulfilled, no conflicts with existing schedule ect.) Safety - it will cause significant clerical problems if students are enrolled in classes that are full or enroll in multiple classes for the same time period. This would cause confusion and require manual correction. It is best that this scenario is prevented from occurring.	The system should display all information on one page Efficiency - user will save time by not having to switch between tabs	The system could have a feature to export schedules to third party calendar apps. Utility - this feature would accommodate users' additional preferences without limiting the availability of other core tasks

[3] [Ontario Human Rights Code]

Part (e): Scenarios

Scenario 1

Context:
Betty is a 3rd-year Computer Science undergraduate student at McMaster University. As her Fall enrolment period approaches, she needs to make sure her course selections for the upcoming semester are well aligned with her program requirements. She wants to organize the remainder of her courses in a way that she is able to graduate on time, while also leaving room for some electives that interest her.

Scenario:
While planning her courses for the Fall term, she goes over the courses she has already completed and makes a note of what remains. She comes across two courses that she must take as part of her degree, but which have conflicting schedules. After evaluating her options, Betty decides to prioritize the course only offered for the fall term, putting the other course on stand-by for the future terms. To ensure that this change won't delay her graduation, she views her entire academic plan, carefully considering how her choices impact the following semesters. Once she is sure that this decision will not be hampering her degree progression, Betty finishes her enrollment for the term and sets a tentative plan for her remaining semesters.

Scenario 2

Context:
Jack is a first-year graduate student at McMaster University, pursuing a Master's in Biology. Unlike undergraduate students, Jack's schedule is less structured, giving him more flexibility in selecting courses and research credits that align with his thesis and research interests. As his term enrollment approaches, he aims to balance his coursework and research commitments in a systematic manner so as to ensure that he's meeting all of his degree requirements.

Scenario:
Jack starts by reviewing the upcoming courses that are relevant to his area of research. He wants to create a timetable that balances the seminars, lab courses, and electives that provide him with the background knowledge he needs while leaving time for his research. Additionally, he needs to coordinate with his supervisor to confirm which courses would best align with his research plan. After planning out the semester and tentatively choosing a few electives, Jack finalizes his choices, ensuring his schedule leaves room for his research activities and potential collaborations. This structured planning helps Jack feel more organized and ready to make steady progress in his program.

Appendix

Raw Notes From Observations:

Given Instructions:
Uncheck your current schedule on MyTimetable, then take the steps you would take to enroll in your courses in 5th year.

Notes:
What web interfaces did they open?
First they opened MyTimetable, then they weren't sure what their requirements were so they went to academic calendar, after that they weren't sure what the best electives were so they searched mcmaster reddit, finally they checked their email communications with academic advising.

How did it look like they were feeling?
They seemed calm, since they only have a few courses left to take, they already knew what to search for and how to find it.

How fast were they able to complete their goal?
Using the practical search feature of MyTimetable, they were able to find their final courses they had already thought of quickly. It was once they needed to think of their final courses they got stuck.

What steps slowed them down?
Opening the academic calendar to find their requirements was slow, because they needed to open a new site and navigate to their program.

What features did they use the most/were more valuable?
The search feature, and one-click adding courses to their schedule was valuable.

Interview Questions:

Point of interview – We want to know what features are important to students for a course enrollment interface

Ask for permission to record answers

Questions:
Warm-up Questions
How old are you? 21 years old
What year are you in? 4th year
What program are you in? Math and comp sci
What is your experience with web interfaces? Quite experienced with web interfaces
What is a web interface you like?
Likes google suite (Gmail), it's very simple compared to microsoft, only has the necessary features

Main Session
What platform(s) do you use to enroll in courses?

MyTimetable, academic calendar (hates that, disorganized, you have to google each individual course), thinks they should be connected
What do you like about enrolling in courses at Mac on MyTimetable?
Likes how easy it is to see course details, like prereqs, likes the interactive calendar, likes personal times (blocking out times), sorting,
What do you dislike?
When a class is closed, you cant view it in your schedule with the rest of your classes, its locked behind a menu too
How do you decide what courses you'll enroll in?
Looks at academic calendar to see what they need, chooses 3 they need and 1 elective, uses reddit, word of mouth
What features are a must for you?
Seeing the rooms of courses is a must, having multiple saved favourites, cycling through all possible schedules
Rank these user goals from most important to least:

1. Effectiveness
2. Safety, it's really good not letting you enroll in the wrong course or unenroll accidentally
3. Efficiency
4. Learnability
5. Memorability
6. Utility

Transcript From Narration:

I am on MyTimetable. Now I'm clicking on my mosaic webpage. I am going to click on to Student Centre, now trying to find my program. I don't remember what it's called but I know it's on the Student Centre. I'm gonna click my academics, now I'm looking for a button that will tell me what my courses to take. I'm going to click view my advisement report now I'm going to scroll down to my fifth year requirements. I'm trying to find my fifth year requirements. I can't find my fifth year requirements. Now I'm going to open a new class tab and go to Academic Calendar. I'm on the undergraduate calendar 2024-2025. Now I'm clicking programs by degree and minors. Now I'm scrolling to Bachelors of Health Science and I click honours Biochemistry co-op, now I figure out which year I enrolled in Biochemistry. I am scrolling to find this year in my fall term. I have to take a co-op work term and then in my winter term I have to take five courses but I know that I am one course ahead, so I only have to take four. I think I can see that on Mosaic but I don't know where. I know it was on Mosaic before. I still need one course of level four Biochemistry and I'm clicking on view course list to find a course that satisfies that requirement. Unfortunately, mosaic will not tell me how many courses I need to complete my concurrent certificate, so I have to track that separately on another application on the list to satisfy level four Biochemistry. I will be taking Biochem 4J03 but I have to go back to the Academic Calendar to check that that one counts for my concurrent certificate. I click on certificate and diplomas on Academic Calendar then go concurrent certificates then scroll to find the certificate. Now I scrolled to see if 4J03 is on the course list and it is. Now I'm on MyTimetable and I'm searching for Biochem 4J03. Now I have added it to my schedule and I go back to Mosaic to see what other courses I need. I'm back in academic requirements and I still need two more courses of level 3-4 course requirements, but this one does not give me a list to choose from so I have to find a course on Academic Calendar.