

Design Project Milestone 2: User Requirements Elicitation & Definition

SFWRENG 4HC3

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1. User Requirements Elicitation Plan & Instruments

1.1 Description of User/Stakeholder Groups

Our User Requirements Elicitation plan focused on gathering insights from first year students at McMaster University. With regards to first year students, we wanted to understand their challenges and needs with their transition from high school to university. The main goal here was to understand how first years tackle their academic scheduling, navigating campus, and managing their time.

To ensure we grasp a good understanding of our users, we will focus on gathering the following types of information from them:

- Routines and Time Management
 - Want to understand student's current tools for managing schedules and assignments. Want to know what their preferences are for planning (i.e. digital or paper planners)
- Campus Navigation Challenges
 - Need an idea on how students locate classrooms and other locations on campus. And if they have any difficulties with finding these locations
- Causes of their Stress and Anxiety
 - Want an understanding of the main sources of stress and anxiety in their transition to university, including balancing academics with social activities
- Other Desired Features
 - Want feedback on potential features they find helpful (e.g., scheduling reminders, campus maps, or study group tools) to understand which would be most effective in addressing their pain points

Other user groups we may explore in our investigations include:

- Secondary Group
 - Returning students, who may need organizational features but are less likely to require campus navigation tools.
- Tertiary Group

- Faculty members who assist first-year students, as they can provide insights into student's challenges and the potential benefits of a supportive tool for academic success

1.2 Elicitation Methods and Justification

To effectively collect data, the chosen methods of elicitation are interviews, surveys, and focus groups.

For interviews

- Sample Size: 2-5 students
- Duration: ~ 20 minutes
- Justification: Interviews allow us to get more in-depth insights into the personal challenges students face, along with what they need. And the interviews are semi structured. This allows us to come in with a clear agenda but also allows for exploration into different aspects the students want.

For Surveys (main and chosen method)

- Sample Size: 15-20 students
- Duration: ~5 minutes
- Justification: The goal was to gather insights on students time management practices, campus navigation challenges, and overall academic experiences. Being able to reach a larger group of students allows for the identification of common trends and pain points. Interviews provide many insights, but surveys allow us to validate these findings across a larger demographic, ensuring that our understanding of the user is complete. Although surveys have limitations, like the lack of depth. To mitigate this, the survey questions have been made to elicit meaningful responses, focusing on key areas such as current tools used for time management, the frequency of missed deadlines, and desired features in a digital campus tool.

For Focus Groups

- Sample Size: 6-10 first-year students per group
- Duration: 45min – 1hr

- Justification: Focus groups will help us understand the challenges and needs of first-year students in a dynamic way. Focus groups will encourage students to engage with one another. This will lead to better dialogue and reveal more diverse perspectives. By facilitating discussions around specific topics, we can capture detailed feedback about current pain points and desired features for the app.

As for how we reached out to the first years:

1. Krish TAs a first-year class, here he can offer a survey
2. Hassan has a first-year elective, so he can ask them about a survey
3. First year students live on res

1.3 Process Summary

To gather insights from first-year students at McMaster University, we will utilize Microsoft Forms to create and distribute our survey, focusing on time management practices, campus navigation challenges, and desired features in a campus navigation and scheduling tool

Participant Recruitment:

- Krish will leverage his role as a Teaching Assistant in a first-year class to introduce the survey.
- Hassan will engage with students in his first-year elective course to encourage participation.
- Everyone else will also reach out to students living in residence halls to maximize our response rate.

The survey will be distributed electronically, ensuring it is accessible and easy for students to complete within approximately 5 minutes. This approach will allow us to collect valuable quantitative data efficiently, helping us understand the common trends and pain points experienced by first-year students. The survey is only accessible to McMaster students and includes the consent form. Participants are not allowed to answer any question without first affirming that they have read the consent form and do consent, and that they are first year students

Our next steps will be to analyze the collected data to identify key themes, trends, and pain points that can help with the design of the application.

2. User Requirements Elicitation Report

2.1 Results and Data

The data analysis involved responses from 17 participants from various academic disciplines, with a notable concentration in Engineering (8 participants), followed by Business (4), Social Sciences (2), Science (2), and Kinesiology (1). All participants consented to data collection, ensuring the validity of the findings.

Key Findings

- Calendar App Usage:
 - The most commonly used calendar applications were Google Calendar (7 users) and Microsoft Outlook (4 users), with a significant number of participants reporting rare usage of their calendars (e.g., "Rarely" or "Sometimes").
 - Most participants reported spending 10 to 30 minutes organizing their study time, indicating a moderate level of engagement with time management tools.
- Qualitative Insights:
 - Participants highlighted the importance of balancing social life with academic responsibilities, tracking deadlines, and finding effective study environments and groups. Notable quotes included concerns about maintaining motivation and optimizing study time, reflecting the challenges faced by students.
- Influencing Factors:
 - Potential biases in responses may have arisen from the phrasing of questions, as well as external pressures related to academic performance and personal circumstances during data collection periods.

2.2 Results Analysis: Observations and Themes

The data analysis reveals several common user problems and practices among the participants, highlighting significant themes that emerged from their responses. A major issue identified is the difficulty many students face in balancing their academic responsibilities with social commitments. Participants frequently expressed challenges related to this balance, with comments such as "balancing social life with university" and "not stressing about academics too much." These reflections suggest a shared struggle

to maintain equilibrium in their busy schedules, supported by the observation that the majority (11 participants) reported spending only 10 to 30 minutes organizing their study time. This limited engagement indicates a lack of effective time management strategies, which could contribute to heightened stress levels.

Another significant problem is the inconsistent use of calendar tools among participants. While various calendar applications, such as Google Calendar and Microsoft Outlook, are available, many respondents reported using them rarely or sometimes. For instance, some indicated they utilized Google Calendar "Rarely." This inconsistency highlights that despite the accessibility of organizational tools, students do not leverage them consistently to manage their schedules effectively. Consequently, this may lead to missed deadlines and increased anxiety around academic responsibilities.

Furthermore, participants reported challenges in organizing their study time. Many indicated they struggle to allocate sufficient time for organization, with several stating they have "little to no time (<10 minutes)" for planning. Comments like "keeping track of deadlines" and "finding proper places to study" reveal that students often feel overwhelmed by their academic workload, hindering their ability to create effective study schedules.

Several potential factors may influence these user problems and practices. High academic demands and looming deadlines can create significant pressure, leading students to prioritize immediate tasks over long-term planning. This could explain the infrequent use of calendar tools, as students might focus solely on their pressing assignments. Additionally, varying levels of comfort with digital tools may impact how often students utilize these applications. Some participants expressed a preference for traditional methods, such as physical planners, which could further contribute to inconsistent usage of digital tools. Finally, personal motivation and tendencies toward procrastination may also significantly affect students' time management practices. As one participant noted, there is a challenge in "being motivated to actually manage my time and stick to a schedule," indicating that motivational barriers can hinder effective time management.

In conclusion, this analysis highlights significant user problems related to time management and the balancing of academic and social lives among McMaster University students. These challenges are exacerbated by academic pressures, varying technological familiarity, and motivational difficulties. Understanding these user practices and problems can inform the development of tailored solutions aimed at enhancing student productivity and overall well-being.

2.3 Results Analysis: Design Implications and Opportunities

Survey insights show that first-year students are looking for an app that makes both academic and social life on campus easier. Many students said they'd love a campus map that includes not just lecture halls but also popular hangouts like cafes, study spots, and social areas. This points to a need for an interactive campus map with real-time directions and a search function for specific building floors. Such a tool could help students find key social spaces and campus services, making it easier to get around and helping them feel more connected to their new surroundings, which could ease the stress of navigating campus.

Managing academic deadlines and social plans was another top challenge for students, suggesting a strong need for a combined time management tool. Students want an app that tracks both classwork and social events in one calendar, with features like color-coded categories, reminders for upcoming deadlines, and notifications encouraging regular breaks or social engagement. By blending these features, the app could help students keep a good balance between academics and social life.

Cross-platform accessibility also came up as a priority, with students preferring access on both mobile and desktop. This means the app should work smoothly across devices, so students can update their schedules on their laptops and easily check them on mobile between classes. Keeping everything synced across platforms would make it more convenient and adaptable to their routines.

While not the most widely adopted feature, student responses indicate a significant interest in the implementation of study group creation features within the app, suggesting that many students see value in collaborative learning opportunities that can enhance their academic experience. To meet this demand, the app would need to incorporate features that facilitate the formation and management of study groups tailored to various courses, allowing users to easily set up groups, specify the relevant courses, and share these groups with their peers. Furthermore, the app should enable users to search for and join existing study groups, fostering a sense of community and collaboration among students. By integrating a platform for study group organization, the app can help students connect with others who share similar academic goals and encourage peer-to-peer learning, which has been shown to enhance understanding and retention of course material. This functionality could also alleviate some of the pressures associated with individual studying, as students may find motivation and accountability in working alongside their classmates.

Lastly, customization options were a popular request, showing that students want an app that suits their unique needs. Offering options to personalize tracked events like academics or social activities, or enabling special modes like an "Exam Week" focus

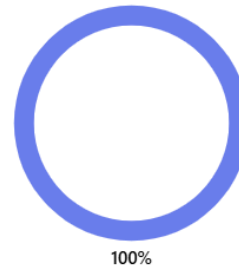
mode, would make the app more useful and relevant. These combined features would create a flexible, all-in-one tool that helps students manage their schedules, reduce stress, and make it easier to get to know their campus.

2.4 Evidence of Data Collection and Analysis

1. Did you read the Consent Form above?

[More details](#)

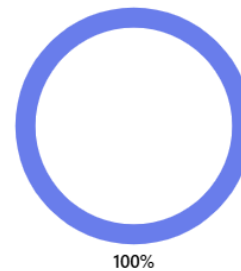
● I have 17
● I have not 0



2. Do you consent to participating in this survey?

[More details](#)

● Yes I consent 17
● No I refuse 0



3. **Are you a First Year Student?**

[More details](#)

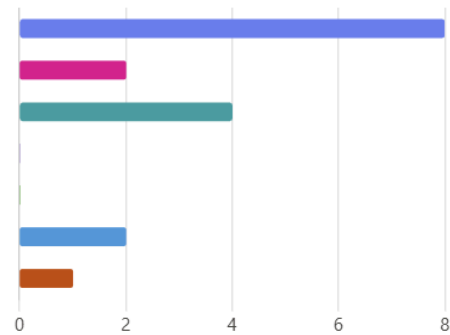
● Yes 17
● No 2



4. What Faculty/Program are you in?

[More details](#)

Engineering	8
Science	2
Business	4
Humanities	0
Health Sciences	0
Social Sciences	2
Other	1

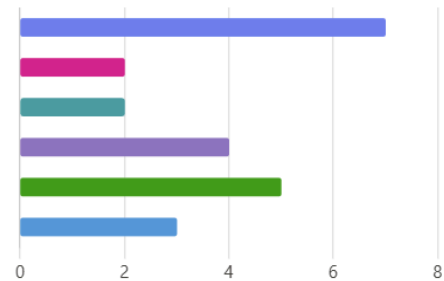


(other: "Kinesiology")

5. How do you currently track your class schedule and deadlines?

[More details](#)

Google Calendar	7
Apple Calendar	2
Physical Planner/Notebook	2
Microsoft Outlook Calendar	4
Avenue2Learn/Mosaic	5
Other	3

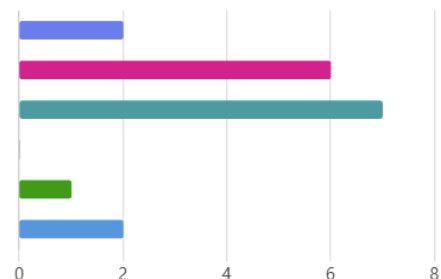


(other: "Notion", "phone reminder apps")

6. How often do you struggle to meet deadlines?

[More details](#)

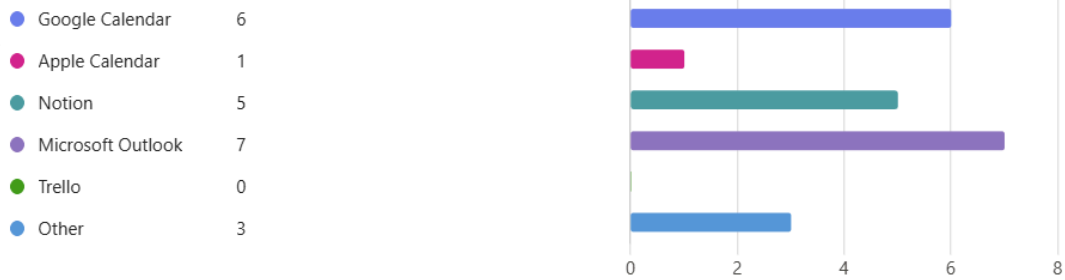
Never	2
Rarely	6
Sometimes	7
Frequently	0
Always	1
Other	2



(other: disregard due to outdated selections "Rarely (1-2 times per semester)" and "Always (More than 10 times per semester)")

7. What tools or apps do you currently use to manage your time?

[More details](#)



(other: “Samsung Notes To Do List”, “phone reminders app”, and “Nothing” (based))

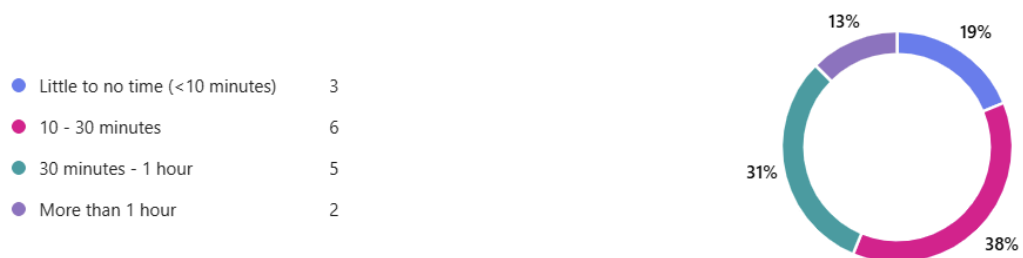
8. Would you find an app that automatically syncs course schedules and deadlines helpful?

[More details](#)



9. On Average, How many hours per week do you spend organizing your academic schedule?

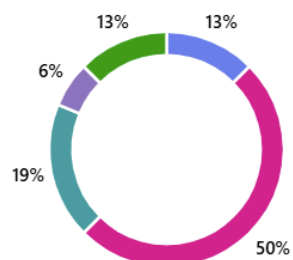
[More details](#)



10. What's the most challenging aspect of managing your academic responsibilities?

[More details](#)

Keeping track of deadlines	2
Organizing study time	8
Balancing academics	3
Prioritizing Tasks	1
Other	2

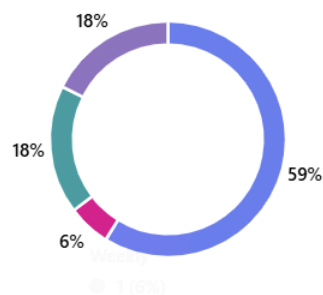


(other: “all of the above”, “not stressing about academics too much”)

11. How often do you schedule time to study?

[More details](#)

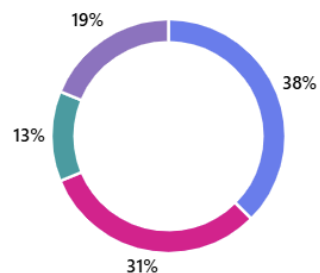
Daily	10
Weekly	1
Before major exams	3
Rarely/Never	3



12. How often do you study in groups?

[More details](#)

Often	6
Sometimes	5
Rarely	2
Never	3



13. Would you use an app that helps organize study groups for your classes

[More details](#)

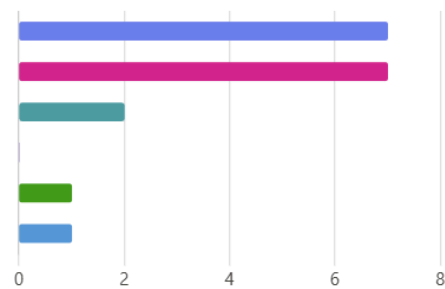
Yes	15
No	0
Maybe	2



14. How often do you find yourself lost on campus?

[More details](#)

Never	7
Rarely	7
Occasionally	2
Frequently	0
Always	1
Other	1

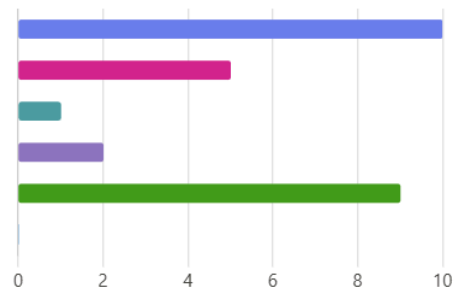


(other: disregard out dated option “Rarely (1-2 times)”)

15. What campus locations are hardest to find? (select all that apply)

[More details](#)

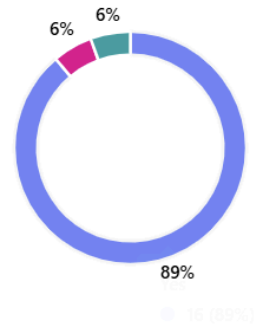
Classrooms	10
Study Spaces	5
Cafeteria/food areas	1
Libraries	2
Administration offices	9
Other	0



16. Would you find a campus map feature useful?

[More details](#)

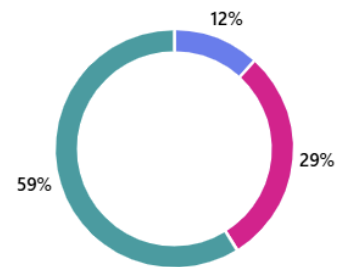
Yes	16
No	1
Other	1



17. How important is it for a campus map to include non-academic locations? (e.g., cafes, social spaces, bus sto...

[More details](#)

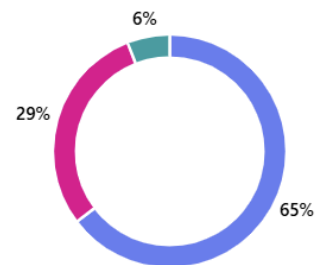
Not important	2
Somewhat Important	5
Very Important	10



18. How often do you feel overwhelmed balancing academic work and social activities?

[More details](#)

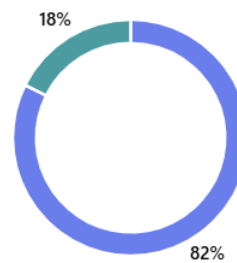
Often	11
Sometimes	5
Rarely	1
Never	0



19. Would you find it helpful if an app also tracked extracurricular activities and social events?

[More details](#)

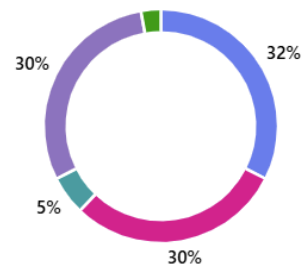
Yes	14
No	0
Maybe	3



20. What causes you the most stress at university?

[More details](#)

Academic Deadlines	12
Balancing social life and studies	11
Navigating Campus	2
Time Management	11
Other	1

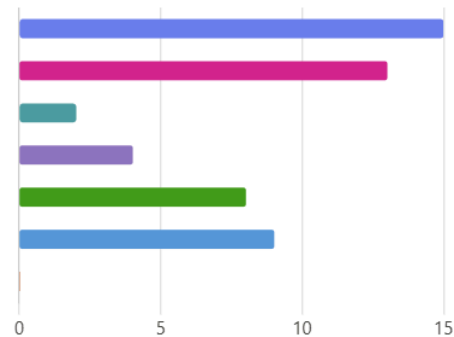


(other: "Maximizing study time, sometimes I feel like I'm not studying the right thing/the right way")

21. What features would be the most useful in a time management app? (select up to 3)

[More details](#)

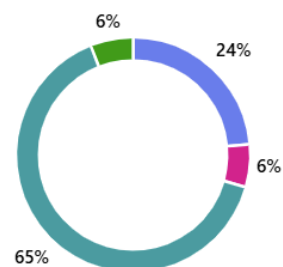
Syncing course schedules and deadlines	15
Notifications for deadlines and classes	13
Campus Navigation	2
Study group organization	4
Tracking extracurriculars and social events	8
Customizable reminders	9
Other	0



22. Would you prefer a mobile and/or desktop version of the app?

[More details](#)

Mobile Only	4
Desktop Only	1
Both	11
Doesn't Matter	0
Other	1



(other: disregard out dated option "Yes")

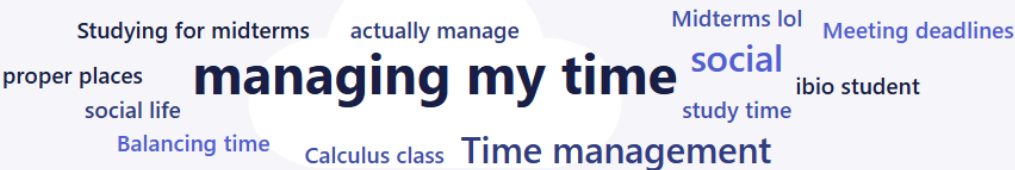
23. What's the biggest challenge you've faced so far as a university student?

[More details](#)

14
Responses

Latest Responses
"Finding proper places to study and optimizing study time"
"being motivated to actually manage my time and stick to a schedule"
...

3 respondents (21%) answered managing my time for this question.



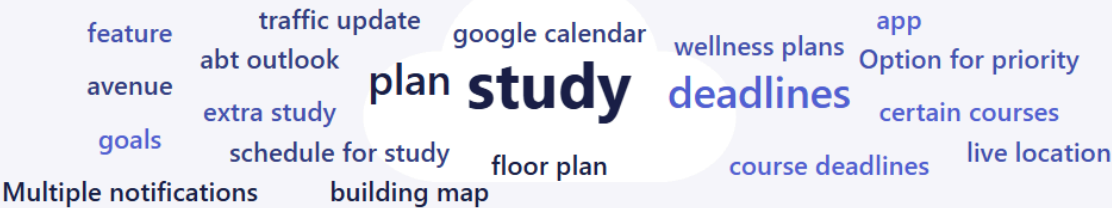
24. If you could add one feature to a campus navigation or time management app, what would it be?

[More details](#)

13
Responses

Latest Responses
"a 'values' section? something that reminds you why you need to have a sche..."
...

3 respondents (23%) answered study for this question.



3. Primary Persona

3.1 Profile

User Profile



Description: Asian student studying on campus. [Image](#) used under license from Adobe Stock

- Name: Emily Zhang
- Age: 18
- Job: First Year Health Sciences student at McMaster University
- Personality Traits: Emily is an organized, high academic achieving student, who is ambitious but gets anxious under pressure. Emily wants to explore campus life, but is overwhelmed with her new workload and independence.

Key Task Goals

- Emily wants to stay organized with her class schedule, assignments, and other important deadlines to avoid falling behind
- Emily wants to be able to easily navigate campus so she can reach her classes without stress or confusion
- Emily wants to develop a social life along with her academic life, without feeling anxious.

Motivations

- Academic Success

- Independence
- Exploration

Frustrations

- Emily feels stressed about having to track so many different courses at the same time. Each course has its assignments, discussion boards, midterms etc. She feels like she might not be able to manage here time without any guidance like she had in high school
- Emily feels overwhelmed from the size of the campus. One building is the size of her high school now she must navigate 10's of buildings each bigger than her high school, on a campus with so many things going on. She feels like she will get lost or be late to class.

Quote

- “I feel like I’m constantly scrambling to keep track of everything—classes, assignments, and where I need to be. I just need one place that organizes it all for me.”

Personal Story

In Emily’s first week, she was late to her chemistry tutorial because she couldn’t find the building. She checked an online campus map beforehand, and even used google maps but it wasn’t enough to help her. She was left flustered and anxious about the rest of the semester. Later that day, she realized she missed a deadline for a small assignment because she didn’t realize it was due. Emily realized she needed a more reliable way to stay on top of her responsibilities. When she heard about a new app being designed for first year students, she felt hopeful it might help her reduce her stress and help her feel more in control

3.2 Evidence of Connection to User Requirements Elicitation Report

Emily’s persona aligns well with the survey’s findings. The goals, frustrations, and personal story of our persona represent common challenges faced by the survey respondents, including managing assignments, navigating campus, and maintaining a social life without becoming overwhelmed. Emily’s struggles, such as getting lost and missing deadlines are based on real needs that were identified in the survey, where students shared concerns about navigating campus and meeting deadlines on time. Therefore, Emily serves as a strong primary persona who has the needs, challenges, and motivations of many first-year students.

4. Scenarios

4.1 Story Scenario (Concrete)

In her second week, Emily downloads a new campus app specifically designed to help students organize their schedules, track assignments, and navigate campus. She begins by inputting her class schedule, setting reminders for assignments, and exploring the campus map feature. The next day, she receives a notification reminding her about an upcoming deadline and another one alerting her about her next tutorial. When she checks the app's map feature, it helps her locate the right building and guides her to her class on time. This app gradually reduces her stress as it ensures she doesn't miss deadlines or get lost on campus. Emily feels more in control of her responsibilities, allowing her to focus better on her studies and engage more confidently in her classes.

4.2 Conceptual Scenario

- Context: A returning student who has been away for co-op re-adjusts to the academic schedule. They use the app to balance both academic and extracurricular commitments seamlessly
- Emily is a first year student at Mac that recently started University. She uses the app to help navigate campus to find her classes, tutorials, exam halls, and other important buildings such as administration offices. Additionally, all of her assignment deadlines and exam timings/locations are available and scheduled neatly within the app, which she uses to see what work she has coming up.

4.3 Evidence of Connection to User Requirements Elicitation Report and Primary Persona

The survey results support the need for an app like the digital planner designed for first-year students. Many first-year respondents already use certain apps to help them track deadlines. These include Google Calendar, Notion, and phone reminders. Despite this, about half(7/15) of the subjects that were surveyed mentioned that they sometimes struggle to meet deadlines, and nearly everyone mentioned that they would find an app that automatically syncs course schedules and deadlines to be helpful. Additionally, quite a few people expressed their struggles in balancing academic and social activities, which is something that can be eased by integrating both academic and extracurricular scheduling into one app.

Emily shares similar frustrations to many of the survey respondents. She has many different courses, each with several assignments and deadlines to keep track of. An app which automatically schedules all of her deadlines in one place would be very

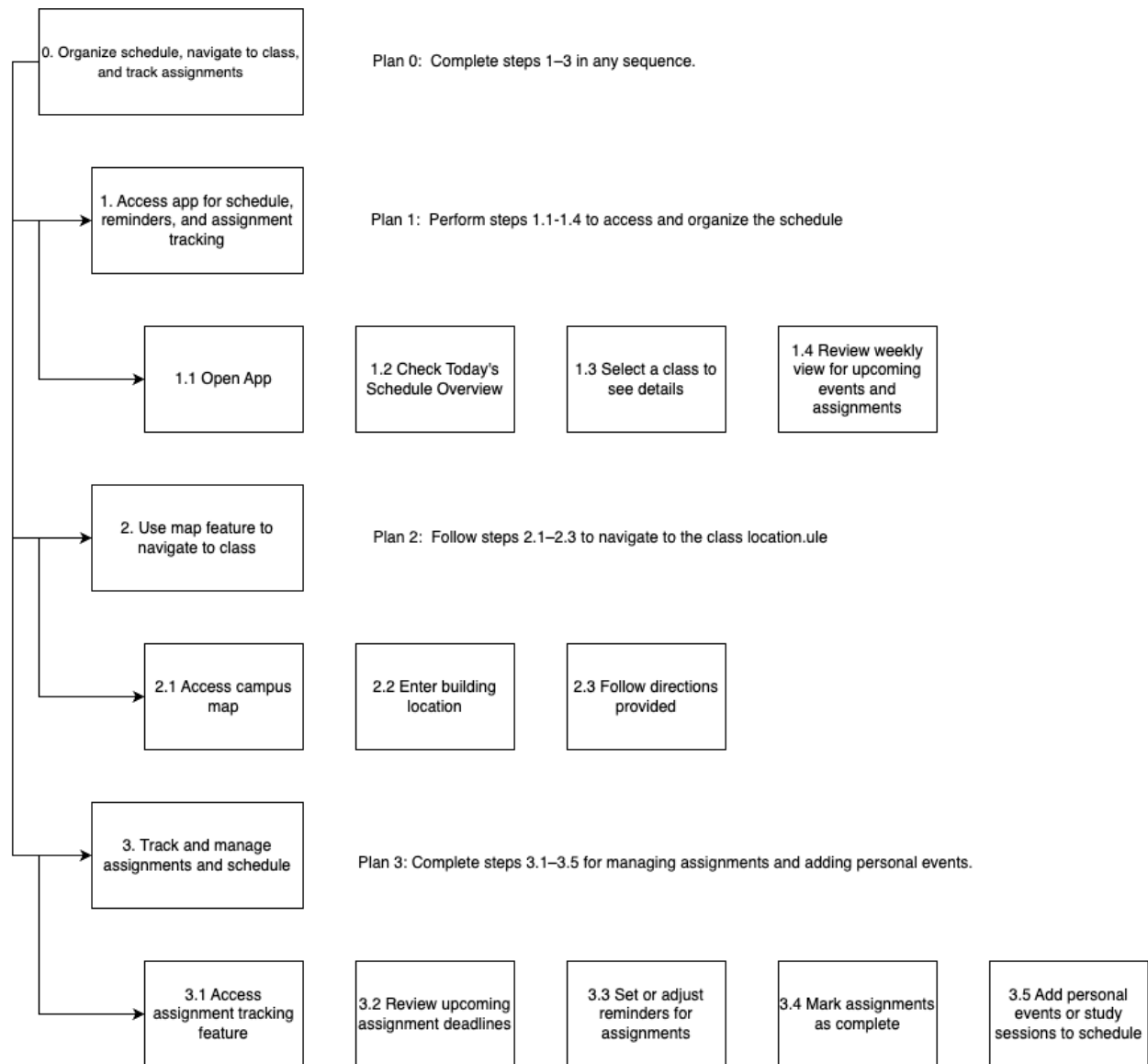
helpful for her and will keep everything organized, which can reduce stress and anxiety. Additionally, being a first year student, she gets overwhelmed by the large size of campus, and finds herself lost very often. Having an integrated map with room locations would cut a lot of time finding her way around campus.

5. Hierarchical Task Analysis (HTA)

5.1 Task Analysis

Goal: Help a first-year student navigate to a class, track and manage assignments, and organize schedules effectively, promoting efficient time management and stress reduction.

HTA:



5.2 Evidence of Connection to User Requirements Elicitation Report and/or Representations

The HTA reflects the core tasks essential for effective time management and campus navigation and is directly informed by the findings from our survey and persona development. Each primary task is broken down to align with user feedback, ensuring that the app effectively addresses first-year students' primary goals and pain points. Survey responses highlighted three primary areas of concern that directly align with the tasks and subtasks outlined in the HTA:

1. Managing Academic Schedules:

- Survey responses showed that over 60% of participants use digital calendars (e.g., Google Calendar, Avenue2Learn/Mosaic) to manage their schedules, though students frequently reported missing deadlines due to the fragmented nature of these tools. This feedback guided the creation of our HTA's "**Organize Academic Schedule**" task, which includes subtasks like reviewing the course schedule and setting reminders for assignments. Incorporating this feedback ensures our app offers a streamlined, central hub for academic scheduling, which first-year students highlighted as essential to reducing stress and improving academic performance.

2. Tracking Assignments and Deadlines:

- Many respondents expressed frustration with the lack of integration between scheduling tools and assignment deadlines, with frequent mentions of missed tasks. To address this, the HTA includes the "**Track Assignments and Deadlines**" task, broken down into actions like setting up notifications for due dates and creating reminders for priority tasks. This structure is intended to mitigate the challenges that students face in juggling multiple deadlines, which were consistently identified as a pain point in both our survey and persona analysis. By automating this tracking process, the HTA supports students' goal of maintaining control over their workload and avoiding last-minute cramming.

3. Campus Navigation:

- Navigational challenges were a prominent theme in our elicitation data, especially in responses from students who reported difficulties finding classrooms and administrative offices during their initial weeks on campus. Reflecting these needs, the HTA includes a "**Navigate to Class**" task with subtasks like opening the campus map and following directions to specific locations. By incorporating these steps, the HTA addresses the immediate navigational pain points faced by students and ensures that the app prioritizes usability for individuals new to campus.

6. User Requirements Definition

6.1 Stakeholder Requirements

Primary Stakeholders: First-year students at McMaster University.

- **Need:** A user-friendly tool that simplifies campus navigation and streamlines academic and time management. First-year students must be able to manage their schedules, assignments, and navigate the campus.

Priority: Must have

6.2 Environmental Requirements

On-Campus Usage:

- **Requirement:** The app must function effectively with real-time GPS integration for navigation on campus. Users must be able to locate classes and campus facilities with minimal delay.
- **Priority:** Must have

Remote Access:

- **Requirement:** The app should support schedule management features for remote or off-campus planning.
- **Priority:** Should have

Offline Functionality:

- **Requirement:** Essential map and schedule features should be accessible offline to accommodate limited connectivity on campus.
- **Priority:** Could have

6.3 Functional Requirements

Academic Scheduling Sync:

- **Requirement:** The app must sync with McMaster's Avenue2Learn and Mosaic systems to provide auto-updates for assignment deadlines, exams, and class schedules.
- **Priority:** Must have

Campus Navigation:

- **Requirement:** The app should integrate a GPS-enabled map of McMaster's campus, enabling students to navigate between buildings and locate classrooms.
- **Priority:** Must have

Notifications and Reminders:

- **Requirement:** The app should notify users of upcoming deadlines, class times, and campus events to help them stay on track.
- **Priority:** Should have

Social Integration:

- **Requirement:** The app could include event-tracking or social coordination features for extracurricular activities.
- **Priority:** Could have

6.4 Data/Technical Requirements

API Integration:

- **Requirement:** The app must integrate with Google Maps API for accurate navigation, providing real-time directions within campus boundaries.
- **Priority:** Must have

University System Integration:

- **Requirement:** Integrate with McMaster's internal systems, such as Mosaic and Avenue2Learn, to pull academic schedules and deadlines automatically.
- **Priority:** Must have

Data Storage and Privacy:

- **Requirement:** User data such as schedules, locations, and preferences must be securely stored and comply with privacy standards.
- **Priority:** Must have

Cross-Platform Compatibility:

- **Requirement:** The app should be compatible with both mobile and desktop platforms.
- **Priority:** Should have

6.5 Usability Requirements

User Interface (UI) Simplicity:

- **Requirement:** The app must have an intuitive UI suitable for first-year students with limited time to explore new software, ensuring ease of use for all functionalities. The aim is three or fewer clicks.
- **Priority:** Must have

Accessibility:

- **Requirement:** The app must accommodate visual and auditory impairments through features like screen reader compatibility and customizable text sizes.
- **Priority:** Should have

Tutorial and Onboarding:

- **Requirement:** The app should provide a brief onboarding tutorial to guide new users through core functions such as navigation, scheduling, and reminders.
- **Priority:** Should have

6.6 Evidence of Connection to User Requirements Elicitation Report and/or Representations

The gathered requirements are derived from insights collected through our survey meant for first years. They highlight the essential needs and challenges of first-year students.

6.6.1 Stakeholder and Environmental Requirements

- **Stakeholder Needs:** A unified tool that lets our stakeholders perform academic and navigational functions aimed at reducing stress is required. This is because our survey showed that 60% of students rely on tools like Notion, Google Calendar, and other planner platforms, but still face difficulties with the fragmented information across platforms.

6.6.2 Functional Requirements

- **Syncing with Academic Platforms:** Feedback showed that students often miss deadlines due to difficulty managing course requirements across platforms. By integrating McMaster's Avenue2Learn and Mosaic systems, the app addresses this critical pain point, reducing the risk of missed deadlines and enabling first-year students to focus on coursework rather than platform navigation.

6.6.3 Data/Technical Requirements

- **API Integration:** Google Maps API integration is a must as 40% of survey participants reported campus navigation challenges. Additionally, incorporating Avenue2Learn and Mosaic APIs addresses the students' reliance on these systems for academic management, reinforcing the app's role as a comprehensive tool for academic support and campus navigation.

6.6.4 Usability Requirements

- **User Interface and Accessibility:** Data showed that first-year students often feel overwhelmed with new tools, necessitating a simple, intuitive interface. Survey responses highlighted students' desire for ease of access and quick functionality, validating the requirement for a UI that prioritizes usability and easy memorability, with limited clicks to core functions, and accessibility support.

This evidence-based approach ensures that each requirement is substantiated by actual user data, making the app an effective tool for addressing the core needs and challenges of first-year students.