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ARTICLE

Resource usage and usefulness: academic help-seeking behaviours of undergraduate engineering students

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ABSTRACT

Help-seeking behaviours (HSB) are central to the learning process and have a profound impact on academic success. We explore the HSB of students enrolled in a Mechanical Engineering programme at a large research-intensive university in the U.S. Using quantitative and qualitative methods, we examine ten resources available to assist students, the frequency with which students use these resources, the perceived usefulness of these resources and students' stated rationale in seeking help from specific resources. Results indicate that students use the available resources at different frequencies, but the frequency with which a student uses a resource is not always related to how useful the student perceives the resource to be. Using Exploratory Factor Analysis, resources were divided into two main groups based on frequency of use, which we classify as 'anchored' or 'detached' based on temporal and spatial accessibility. Patterns emerge in student HSB showing that students access resources in a progression from more detached to more anchored resources. The primary explanatory variable to student HSB is convenience, defined by temporal and spatial accessibility. The more convenient a resource is perceived to be, the more likely a student is to use that resource.

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Learning, as a form of knowledge transmission, is a cognitive, affective and interactive process (Hansen 1982). When students learn and internalise knowledge, they often seek assistance from sources external to themselves. Thus, academic help-seeking is a fundamental part of the learning experience. In many educational environments, learners are encouraged and expected to be responsible for their own understanding of material, including locating and utilising resources to help them understand and master the material. College students are expected to spend more time learning outside the classroom than inside it. Consequently, it is important to understand how students study and seek help. Using a grounded theory approach, we explore the academic help-seeking behaviours of undergraduate engineering students regarding the sources of assistance they use and the rationale behind their choices. A better understanding of student HSB can inform the development of courses and teaching materials, as well as assist colleges in improving student learning outcomes.

1. Seeking help in higher education

Help-seeking behaviours (HSB) are a central component of the learning process and have a profound impact on academic success (Karabenick 2003). Seeking assistance is often overlooked as something students 'just do' in the course of their studies rather than as a set of socialised and learned behaviours (Herring and Walther 2016). While students learn and develop HSB throughout their childhood, undergraduate students often have to adapt previously used HSB and develop new HSB (Karabenick 2003). This pattern is particularly evident for students who attend large universities with high enrolment introductory classes, and therefore a higher student-to-teacher ratio.

HSB has frequently been examined through the theoretical lens of self-regulated learning (Herring and Walther 2016). Common influences on HSB include positive factors such as the level and source of internal motivations (Ryan and Shin 2011), and negative factors such as fear of negative experiences resulting from seeking help (e.g. 'losing face', revealing limited knowledge) (Karabenick 2003). Using a self-regulated learning approach, researchers have applied the concept of self-efficacy as a key constituent in developing HSB (Herring and Walther 2016; Ryan and Shin 2011). Self-efficacy refers to a person's perceived abilities to carry out tasks that impact their lives (Bandura 1994). Since self-efficacy is based on cumulative previous experiences, Herring and Walther (2016) argue that an individual's HSB will be heavily determined by past experiences – positive, negative and neutral.

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Study habits can be a form of self-regulated learning, and self-regulation can inform HSB. However, past work on self-regulation approaches focused largely on the individual. Very few studies have taken into consideration the cultural and situational context that influences HSB (Järvelä 2011). For example, cultural norms can shape perceptions of appropriate HSB, as can available resources. Recent research has started to focus on contextual influences on HSB including the impact of gender and race (Herring and Walther 2016), psycholinguistic aspects (Puustinen, Bernicot, and Bert-Erboul 2011), and learning environments (Mäkitalo-Siegl, Kohnle, and Fischer 2011).

The vast majority of literature on HSB conceptualises help-seeking as an interpersonal activity that involves reaching out to another person for help. Here, we take a broader approach and consider the use of any resource external to oneself (e.g. Internet, a textbook) as HSB, whereas other authors often view a non-human resource as 'self-help' (Neuman 2002). In addition, initiating help-seeking is often seen as being spurred by an event like receiving a low grade (Herring and Walther 2016), whereas we consider HSB as a routine activity in which all students engage at some point during the course of their studies. In sum, we view HSB as a broad set of both intentional and unintentional behaviours and habitual actions (or non-actions in the case of help-avoidance) aimed at achieving an academic goal. Given that HSB is a routinized part of the learning process, we explore students' decisions and practices by examining the resources available to assist students, the frequency with which students use the resources, the perceived usefulness of the resources, and students' underlying motivations in seeking help from specific resources.

2. Context for this study

This study focuses on a Mechanical Engineering (ME) programme at a large research-intensive university in the U.S. Midwest. The university overall is viewed as 'selective' from an admissions standpoint and the department is ranked in the top 10 ME programmes in the United States. The undergraduate programme requires 128 semester-credit hours to complete the degree, and faculty and students alike consider the curriculum technically rigorous and the workload demanding. Students routinely cite the high workload as detrimental to their sleep habits and social relationships (Briody et al 2018). Departmental members (i.e. faculty, staff and students) describe the academic culture of the programme as 'traditional' in its pedagogy and approach, in that courses tend to be high-enrolment lectures (between 60 and 120 students) that beget an impersonal atmosphere (Berger et al 2017). About 1,400 undergraduate students are enrolled in the programme, with a student-to-faculty ratio of about 20:1. The ME undergraduate population is 15% women (85% men) and 39% international students, primarily from East and South Asia. The majority of the ME student body can be classified as 'traditional' in that students are typically 18–23 years of age and live on or near campus.

3. Methods

3.1. Sampling frame and data collection

A grounded theory approach informed both the quantitative and qualitative data collection. The sampling frame was the ME undergraduate student population. Participants were recruited through broad email announcements, direct in-person recruitment in classes, and direct contact through several ME student organisations. Quantitative data involved a survey, for which there were 355 survey respondents. The survey asked students a series of questions about their experiences including their learning styles, relationships, perceptions on the climate and help-seeking behaviours. These questions were designed based on initial conversations conducted at the start of the project. In this article, we focus on the set of questions regarding HSB including: time spent studying alone and in groups, study locations and resources used. Responses were collected using the Qualtrics online software tool.

Qualitative data entailed individual and group conversations; we used semi-structured sets of questions to probe student experiences in the programme. The sample included 14 individual conversations and 23 group conversations consisting of 92 participants, for a total of 106 participants. The conversations were conducted by members of our research team including social scientists and engineering education researchers. All survey and conversation participants were ME majors (second, third and fourth year), enrolled in a variety of course types including large lectures, and smaller lab and design-based courses. All students consented to participate in this research and because students volunteered for the study on a self-selected basis, our sample includes an over-sampling of women (22% of participants) and an under-sampling of international students (20% of participants).

3.2. Quantitative data analysis

We used basic descriptive statistics to understand underlying trends in the survey data. For Likert-scale questions, we employed two approaches to data summary. We aggregated responses from multiple scales into a single measure, for instance by combining 'somewhat useful' and 'very useful' into a single estimate of the general perception of usefulness

of a particular resource. This approach is appropriate because an individual's perception of usefulness is highly subjective, and our goal is to capture a general sense of usefulness of the resources available to students. This choice also reinforces the integrity of the analysis, which seeks to characterise the extent to which students found the resources useful, to any positive degree (as opposed to a neutral or negative opinion about a resource's usefulness). We also used an odds ratio approach as follows. The odds of a student giving a particular response on the survey were simply the number of students who indicated that response divided by the number of students who did not. We calculated the odds of each response occurring. Then, we normalised those odds by a specific metric of interest, creating an *odds ratio* (OR) that expressed how much higher the odds were for one response as compared to another.

Using R statistical software, we conducted a second phase of analysis specifically examining student HSB patterns as indicated by the frequency of utilisation of each resource on a six-point Likert scale. First, we created a correlation matrix to examine the significant relationships within the Likert scale data. There were several significant correlations above 0.30, which is a general standard for prompting further examination of an underlying data structure (Tabachnick, Fidell, and Osterlind 2001). An exploratory factor analysis (EFA) was completed to group the individual resources into factors based on their shared variance. The absolute values of skewness and kurtosis of the data were less than 2.0 and 7.0, respectively, indicating that the data did not severely violate the normality assumption required for the maximum likelihood factor extraction method (Godwin 2016). The number of factors was determined through a parallel analysis of the correlation matrix and confirmed by visual inspection for a 'break' in the line of eigenvalues on a scree plot. The factor rotation was oblique ('oblimin') since intercorrelation between the factors was expected. The loading of each resource onto each factor was cut off at a minimum of 0.32, such that at least 10% of the resource's variance is shared within the factor. Loadings at 0.50 or above are strong, and factors are considered stable with at least three items (Costello and Osborne 2005). The EFA results were complemented by the qualitative data analysis which informed the interpretation of the resultant factor structure.

3.3. Qualitative data analysis

Conversations, lasting one hour on average, were audio recorded and then transcribed. We developed codes based on emergent themes. The resulting code structure was iterated upon by multiple researchers on our team until a consensus emerged. We then employed content analysis, applying the codes to relevant areas of the text and comparing the codes for prevalent themes and patterns. Finally, we compared the themes and patterns from the qualitative data analysis with the survey data to identify areas of overlap and/or divergence between the two data sets.

4. Findings

4.1. Odds ratio calculations related to frequency and use of academic resources

We examined student HSB in relation to 10 different resources available to them (Table 1). While students may access other resources (e.g. assistance from an engineering professional), we analysed those resources that students and faculty talked about in our initial set of project conversations.

We were interested in understanding the frequency with which students use each of these 10 resources as well as how useful they perceived the resources to be. Frequency was rated on a six-point scale ranging from 'once per day' to 'never.' Later, we categorised the responses as either 'at least once per week' (encompassing the three most frequent points on the scale) or 'less than once per week' (encompassing the three least frequent points on the scale). We chose one week as the relevant unit of time measurement because in most classes, students have at least weekly assignments; one week also represents a reasonable quantum of new content in most engineering courses. Usefulness was rated on a five-point scale ranging from 'very useful' to 'completely useless' (with 3 = 'neutral'); a further option of 'no opinion' was also available to survey respondents.

Table 2 summarises this data using an odds ratio (OR) calculation that expresses the frequency of use and the usefulness odds as compared to a specific metric of interest: the odds for frequency and usefulness of professor office hours. Our goal in using this normalisation is to easily compare HSB for the other nine resources to what can be regarded as the most authoritative source of help: the course instructor.

Table 2 displays the 10 resources in descending order of frequency of use. The table reveals a *dramatic difference in frequency of use among the resources*, with OCP, PEC, T, ORC, and ORNC consulted at a much higher rate than PR/OH. The odds that students access peer support once per week are dramatically higher than the odds that they go to faculty office hours once per week. Indeed, of the 10 resources, PR/OH has the lowest odds of weekly usage of any academic support option.

Table 2 also directs attention to the perceived usefulness of the 10 resources. For example, while OCP is listed as the most frequently used resource, it ranks comparatively lower in usefulness. It is likely

Table 1. Resources available to students for help.

Resource name	Abbreviation	Description
Online course portal	OCP	This resource includes the learning management system (LMS), and/or a course blog.
Online resources specifically created for the course	ORC	These resources tend to be instructor-created videos, but can also include video and other resources packaged with the course textbook.
Online resources not created specifically for the course	ORNC	These resources are primarily online documents and YouTube videos identified via internet search engines.
Course textbook.	T	This category refers to the textbook itself, and not any associated supplemental content.
Peers enrolled in course	PEC	These are peers who are enrolled in the same course, although not necessarily enrolled in the same section of the course. At the institution, some courses have as many as 7–8 sections per semester. Students connect with their peers both in-person and remotely (digital messaging).
Peers not currently enrolled in course	PNEC	This resource includes peers who are not currently enrolled in the course, but are known to the student through (for instance) a sorority, fraternity, on-campus organisation, or other means. These peers tend to be upper-division students who have already taken the course or are in the same major.
Professors during class	PR/C	This resource is the instructor of the course and includes questions asked during the lecture period, and/or brief conversations immediately before or after class.
Professor in office hours	PR/OH	All instructors hold office hours in specific locations (usually their office) at specific times. These are typically limited to just 1–2 h per week, and are generally scheduled by the instructor based upon their availability.
Other supplemental instruction options	OSI	This institution offers a variety of tutoring options, many through student organisations.
Teaching assistants	TA	For some courses, teaching assistants hold specific office hours in specific locations to support students in need of help. In addition, the department provides, for certain core classes, tutorial rooms staffed by graduate TAs and open during business hours. These tutorial rooms provide a drop-in environment in which students can access help.

Table 2. Odds ratios for frequency and usefulness of various support resources.

Resource	OR_{freq}	OR_{useful}
Online course portal (OCP)	32.75	1.42
Peers currently enrolled in course (PEC)	29.84	3.76
Online resources specifically created for the course (ORC)	16.27	3.01
Online resources not created specifically for the course (ORNC)	14.64	2.09
Course textbook (T)	14.22	1.03
Teaching assistants (TA)	4.25	0.93
Professor during class (PR/C)	3.41	1.20
Other peers not currently enrolled in course (PNEC)	2.01	0.25
Other supplemental instruction options (OSI)	1.64	0.47
Professor in office hours (PR/OH)	1.00	1.00

that students are required to use the OCP for their classes to access course policies or download/upload homework assignments, and as such it does not typically function as a help resource while they are completing their work. Learning Management Systems (LMSs) are typically used in transactional ways by faculty (e.g. to assign homework, post rubrics), which likely explains why students use these tools so frequently yet rate their usefulness comparatively low. Therefore, we generally do not consider the OCP to be an academic help-seeking resource itself. The most useful academic support resources are PEC and ORC, whose ORs for both frequency and usefulness are quite high compared to the other resources.

One of the most striking aspects of the pattern in Table 2 is that the *frequency of use for a particular resource does not necessarily correlate with its perceived usefulness*. If we were to predict frequency of use based on the perceived usefulness of a resource, we would suppose students seek help from professors during office hours at a much higher rate than is evident in the survey data. Survey results indicate that to the contrary, students seek help from all of the listed resources more frequently than they seek help from their professors during office hours. These data indicate that students sometimes use resources they perceive to be less useful than other resources reported to be more useful. The incongruence between reported frequency of use of a resource and the perceived usefulness of that resource (particularly for T and OCP resources) is a point to which we will return later in the article.

4.2. Factor analysis underlying academic resources

Since the perceived usefulness of a resource appears to only be tied weakly to HSB, we conducted an Exploratory Factor Analysis (EFA) to elicit patterns within the frequency of use Likert scale data that may explain how students utilise available resources.

The initial factor structure which included all 10 resources was less than ideal. It not only contained resources cross-loaded on multiple factors, but also there was no clear distinction among the three factors. Since the prior analysis revealed that the OCP was used as a transactional resource more than academic help-seeking resource, it was removed from the EFA model. The factor structure shown in Table 3 was the result.

Table 3 contains two strong factors, Factor 1 and Factor 2, and one weak factor, Factor 3.

Factors 1 and 2 represent two important classes of support resources: anchored (Factor 1) and detached (Factor 2). The terms ‘anchored’ and ‘detached’ refer to availability of and access to the resources; these concepts were developed in concert with the qualitative analysis. Anchored resources (PR/OH, TA, PR/C

Table 3. Factor loadings from exploratory factor analysis.

Resource	Factor 1	Factor 2	Factor 3
Professor in office hours (PR/OH)	0.876		
Teaching assistants (TA)	0.450		
Professors during class (PR/C)	0.437		
Other supplemental instruction options (OSI)	0.409		
Online resources not created specifically for the course (ORNC)		0.617	
Online resources specifically created for the course (ORC)		0.436	
Peers not currently enrolled in course (PNEC)		0.376	
Peers enrolled in course (PEC)		0.333	
Course textbook (T)			0.628
% Variance	15.0%	9.8%	6.6%
Cumulative % Variance	15.0%	24.8%	31.4%

and OSI) require students to access them at a specific time (usually during normal business hours) and place, like a classroom or faculty office. These resources exhibit most of the lowest frequency of use ORs. Conversely, detached resources (PEC, PNEC, ORC and ORNC) can be accessed by students independent of time and space. Online resources can be accessed at any time and with computer labs open 24 h/day and widespread use of personal laptops, from almost any physical location. Peer availability is also spatially and temporally flexible, a point discussed in more depth later.

The EFA revealed that two of the resources we explore, the textbook (T) and the online course portal (OCP), are unique compared to the other resources examined. Once the OCP resource was removed, the textbook was the only resource that loaded to Factor 3. Our intuition was that the textbook would load as a detached resource because students own their textbook and therefore have easy access to it. However, the textbook is apparently distinct. Phenomenological research has shown that students 'depended heavily on the textbook during their problem solving rather than using it as a resource to complement their knowledge' (Lee et al. 2013, 284). The authors go so far to say that 'students use the textbook in lieu of their knowledge' (285). In a study of textbook usage, Berry et al. (2011) found that most students do not read the course textbook and find the textbook to be less important than other course resources such as attending lectures and class notes. The students in their study reported using the textbook primarily as a 'substitute' for attending lecture or for solving particular homework problems. Following the results from previous studies, we hypothesise that the ME students in this study use the textbook primarily to access homework problem sets rather than as a resource to understand course material. As with the transactional nature of the OCP, we expect the transactional nature of the textbook to be the underlying explanation for why this resource did not fit well within the EFA model. It seems that students use both the textbook and the online course portal primarily to access (and in the case of the OCP, submit) homework assignments, and not as a resource to assist in completing the assignments or enhancing conceptual understanding. When also removing the textbook from the EFA model, the two factors become stronger in the sense that the cumulative proportion of variance explained by the model increased from 24.8% to 29.5%.

Therefore, we offer a two-factor model for HSB, one corresponding to resources bound by time and/or place ('anchored' resources), and the other not bound by time or place ('detached' resources). The analyses demonstrate three important points: (1) students use different resources at dramatically differing frequencies, (2) the frequency with which students use a resource is irregularly correlated with its perceived usefulness and (3) students use resources primarily based on their ease of access. While anchored resources are defined by the educational institution, detached resources are influenced by the educational setting but not dependant on the institution.

4.3. Content analysis of qualitative data

4.3.1. HSB as a progression of resource usage

The qualitative data reveal that, in general, student HSB follows a progression of resource usage that mirrors the anchored and detached factors described above. Students seek help from the detached resources prior to utilising the anchored resources, and interview data reveal a further distinction within this two-factor description. Within the detached resources, which students generally consult first, they typically report a two-tier process:

- Tier 1: Students engage in individual work, studying alone and utilising individualised, detached resources (ORC and ORNC).
- Tier 2: Students reach out to peer-based detached resources and study in groups (PEC and PNEC).

Similarly, anchored resources contain two tiers as follows.

- Tier 3: Students consult teaching assistants and possibly other weakly anchored tutoring services (TA and OSI). These resources are weakly anchored because they are available more often and at potentially more convenient times (e.g. TA office hours or tutoring in the evening) than more strongly anchored resources.
- Tier 4: Students seek help from professors during office hours (PR/OH), which is the most strongly anchored resource available to them. This resource is likely available only during business hours, only for a small number of hours per

week, and in a specific location (usually the instructor's office). Similarly, students seek help from professors in class (PR/C), a highly anchored resource as students can only access professors before, during, and after class when class is held and when time allows.

Students indicated to us that they do not seek assistance from later tiers until they have exhausted all resources in the previous tiers. For example, a student consults a teaching assistant only after having sought help from peers, which happens only after attempting the work alone. Seeking assistance from a professor is the final resource consulted, if at all, and only after all other resources have been utilised. Detached resources (Tier 1 and 2) are the most frequently used and the most easily accessed. Anchored resources (Tier 3 and 4) are the least frequently used and the least accessible. The patterns emerging from both the quantitative and qualitative data are consistent and point to a clear sequence in resource usage: detached, then anchored.

The following quotations illustrate students HSB regarding resource usage progression from detached to anchored resources:

- 'First off, I'd really want to check over myself just again and again. Check my notes. Check the textbook, look online, see what I can find. Then go to my peers I guess, my friends or other people in my program.'
- 'First, I'll try to figure it out. Second, if that doesn't work, lecture video. Third, I'll ask a friend, and if we struggle, well… There's been one or two times where I've just taken the hit and then just waited for the homework solutions to be posted, and then made sure I studied that.'
- 'I work [the problem] out [myself]. Then I see if I get stuck… After that I would go to my social group that I study with… Then I go to people I don't necessarily study with but I know that are in the same classes. I don't necessarily always do this because some of them I know their grades are worse than mine in the class so I don't necessarily trust all of their answers. Then after that, I would say that I don't really go to the [Tutorial Rooms] very often. I've gone once this year and…I guess twice including…last semester as well.'
- 'Typically, I try to work through things on my own, but the Tutorial Rooms though, I do go to those quite a bit for homework. I'll work through it on my own, and then when I can't get it, I'll go [to the Tutorial Rooms].'

Survey results support these narratives. Sixty per cent of respondents indicated that they attempted to complete assignments and study alone (Tier 1) prior to seeking help from and studying with peers (Tier 2). Students also reported studying for a longer period of time each week alone (almost 10 h) than in study groups (about 6 h). While Tables 2 and 3 indicate that peers are the most frequently accessed resource (after OCP), if we combine the individually used resources (ORC and ORNC), then together they are used more frequently than peers.

Herring and Walther (2016) found a similar pattern in their study, which they explained as a 'recursive "try again" loop' (21) whereby students seek help from a resource and then evaluate if the issue has been resolved and if not, then they move onto the next resource in the progression. Our results also parallel Herring and Walther's finding that seeking assistance from a professor was the last resource from which students sought help. They argue, 'the iterations through the loop may include going to the professor last after trying all other courses of action' (21–22). Both Herring and Walther's and our research indicate that engineering students seek help from resources in an established progression (tiers) in which the last resource of the progression is the professor.

4.3.2. Peer-to-peer HSB

While students begin studying individually using resources they can access on their own, peer collaboration (Tier 2) is critical to student academic success. About 80% of students reported routinely studying in groups to complete homework assignments and prepare for exams. Reaching out to peers can include physically studying in the same space, or receiving assistance through online chats, group messaging apps, and/or phone calls. Elsewhere, we have documented how the culture of the programme fosters collaboration over competition, and as a result, students develop a strong sense of comradery and mutual support (Briody et al 2018). The following are a few quotations from students detailing why they seek assistance from peers:

- 'You have to do everything in groups because there is no way you could survive on your own…!'
- 'I think if everyone wasn't in the same boat, it'd be really hard to do. You can't continuously exert yourself alone. If everyone's doing it with you, it's totally doable.'
- 'It's also a collaborative environment, because I feel like you have to work with others if you want to succeed in this major. I feel like generally my relationship with my peers is pretty friendly and healthy. We try to help each other out as much as we can.'

- 'I think that for MEs, I don't think I would be able to do a lot of the homework straight by myself because I'm always checking something with someone else to make sure that I didn't make up these numbers.'
- 'I know that, say you missed the notes on a slide or something, you can ask your buddy sitting next to you. Or even if you just sat down in a lecture, and you don't even know anyone, [those around you will] lend you a hand and they'll help you. I'm in a ton of different groups that help me with any type of homework that I need or if I missed the notes from a class. I know that I have my friends that I can rely on to help me through the course.'

4.3.3. 'Right in front of you': temporal and spatial accessibility as a driver for resource usage

Qualitative data also help illuminate the OR discrepancies between frequency of resource use and perceived usefulness of the resource. Student HSB was motivated by ease of *access* to the resource. Students overwhelmingly report that teaching assistants and, especially, professors are substantially less accessible, both temporally and spatially, than peers and individually accessed resources.

- 'Google – it's right there on your computer, right in front of you. Your friends or your study group are usually on your phone, which is also right next to you. In order to contact your professor, you have to type up a professional email or go to a Tutorial Room, and it's just a little extra work. Sometimes that work is worth it, because you better understand it, but usually if it's just a little question here or there that you don't understand, it's easier to use one of the smaller resources than to go big.'
- 'It's a lot easier to go to your friends, because they're accessible at all hours. If you're up until 2:00 in the morning doing homework, you're not going to be able to go to a Tutorial Room. . ..'
- 'I'll say my first person I would go to is my roommate because my roommate and I are taking the exact same classes and he's very smart, gets straight A's. He's a very good resource and he also lives in the same room so I don't have to go anywhere so it saves a lot of time. The second person I would access is another person on my floor – just because of the proximity so I don't have to go out of my way to go somewhere.'
- 'I think a majority of students would work on their homework later in the day after their classes. By the end of the classes, faculty are home.'
- '[The faculty] go home for the day. I don't really expect them to get back to me immediately when I need it right there and then. There's the internet which is right there, and there's your friends which is just a text away.'

Students often reported time conflicts with professor office hours, either due to their schedule of classes or because they complete much of their work in the evening when professors are not available. Students also report that they often worked in places too far from faculty offices. According to our survey data, students indicate that when they study alone, they are typically in their residence (e.g. dorm room, apartment) in the evening (defined as 17:00–22:00) or later at night (defined as after 22:00). When students study in a group, they typically meet in the evening and at night in academic spaces (e.g. vacant classrooms, the library, computer labs). It appears easier to look something up online, phone or text a friend, or meet up in person with a peer to discuss an assignment. Even though students feel that seeking help from the instructor can be useful, they infrequently used this resource because it is viewed as too *inaccessible*, especially compared to other resources available.

4.3.4. Multiple resource availability

While students indicated that some of the resources available to them are less accessible, and therefore inconvenient to use, they still have a plethora of resources from which to choose. Though some of the resources students use are not organised or provided by the university (e.g. ORNC, PEC and PNEC), most of the resources involved in HSB are supported by the university. Students expressed awareness of and appreciation for the array of resources the programme offered.

- 'ME is a very established program, so it has a lot of resources available. The onus is on you to seek out those resources whenever you need them.'
- 'I think it's more up to you. They give the tools and resources to be successful and to do well on tests and everything, but you have to really go to them and seek those out and work hard at it.'
- 'I feel like what [the program is] doing is like, "Here's a bunch of help, and it's your responsibility to use all that." They specifically state that too. I think I heard many statements like that. "It's your responsibility to make use of all the help that's available." I like that way, because that's going to be your life in general.'

The above quotations from students hint at the kind of expectation of self-reliance and resourcefulness that is built into the culture of the programme. The programme encourages students to engage in self-regulated learning. Students are actively encouraged

to try to solve problems on their own and reach out to peers, tutoring resources, teaching assistants, and even professors when needed. The programme's approach to help-seeking is to provide an array of resources to assist students, while promoting a combination of self-sufficiency and peer comradery. Most students felt that if they worked hard and sought help from the resources available, they would be able to overcome the challenges of a rigorous programme to succeed academically. In this environment, enacting successful HSB is an expected and essential aspect of academic success.

5. Conclusion

Our exploration of HSB revealed the following four trends: (1) there are a variety of resources available to students that are used at very different frequencies; (2) the frequency with which a student uses a resource is not always related to how useful the resource is perceived to be; (3) students access resources in a progression from detached to anchored resources, and ordered sequentially within factors by tiers of accessibility; and (4) the primary explanatory variable for HSB is convenience, defined by temporal and spatial accessibility. Students report opting to use a resource they consider more convenient than a resource that might be more useful. Thus, in students' help-seeking decision-making processes, convenience of a resource is considered more important than its time efficiency.

The results from this study inform areas for future research. First, are there other resources that students routinely use to augment their learning? Second, how effective are each of these resources in helping students to complete assignments and/or conceptually understand the course material? What impact does HSB have on academic outcomes? Reported resource use and perceived usefulness may not be indicative of the academic outcomes achieved after using that resource. Some of the most convenient and frequently used detached resources carry the greatest risk of being ineffective at helping students learn. For example, online resources external to the course (ORNC) are not regulated for accuracy, nor are peers. Students may end up seeking help from resources that glean inaccurate information, thus hindering the learning process. Third, to what extent are students expending time and effort on inefficient HSB? What is the effect of such behaviour other aspects of students' lives such as time management, stress, and sleep? Fourth, how can we redesign the less frequently used attached resources so that they are more convenient to students and therefore increase the likelihood that students will seek help from those resources? Finally, do these HSB patterns hold for all students? This article describes student HSB generally. However, the student body is not uniform and individual students access various resources for different reasons. It would be valuable to know the impact of number of credit hours taken, year in the programme, and demographics on HSB. Such questions might form a future research agenda.

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