

Factors influencing help seeking and help avoidant behaviors among physics and life science majors

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Students' use of support from peers and instructors is an important aspect of success in college. This preliminary phenomenographic study examines a variety of help seeking behaviors of undergraduate majors in physics and life sciences and factors that lead to those behaviors. Seven students described their experiences using semi-structured interviews during the summer of 2021. The analysis was structured around identifying characteristics of peers and instructors, as well as personal help-seeking attitudes, that either promoted help seeking or help avoidance. Peers were generally the first source of help, and were prioritized based on ability and the closeness of the relationship. Instructors fostered help seeking through availability and a non-judgemental demeanor. A feeling of vulnerability and fear of judgement was cited as the most common reason for avoiding help. The findings provide insights for faculty and departments seeking to encourage student success.

I. INTRODUCTION

Improving student success in STEM (science, technology, engineering, and math) majors, such as physics, is a national priority and a concern for many departments. STEM programs regularly have lower retention rates when compared to non-STEM majors. It is important to understand the factors that may contribute to lower levels of student success, among these, how students seek help from other individuals, particularly peers and faculty, and why students either seek or avoid help when they know they need it [1–4]. In this study we investigated help-seeking behaviors through interviews with undergraduate majors in physics and life sciences. We focused on help-seeking related to learning and coursework and did not include help seeking related to other aspects of college (e.g., financial aid) or life (e.g., stress management). Our research questions were:

1. Who do undergraduate STEM majors seek help from and what characteristics of those individuals led to seeking or avoiding help?
2. What personal attitudes held by help-seekers were linked to help-avoidance?

II. BACKGROUND

Martin-Arbo *et al.* define help seeking using a self-regulated learning perspective as a social strategy that involves seeking support from individuals (e.g., classmates, teachers) and other sources to achieve good results in an academic context [5]. The literature also distinguishes between help seeking and information seeking. Whereas information seeking refers to the behavior of searching for information to aid oneself, typically in the form of using a text book or online resource, help seeking explicitly refers to the behavior of going to another individual other than oneself for aid [6]. The process of help-seeking is multifaceted and includes the student’s motivation for seeking help, whether they decide to actually seek help, and from whom they seek help from. Previous research has attempted to characterize these processes.

Ryan *et al.* investigated motivations (or goal orientations) behind particular help seeking behaviors [7]. They identified three goal orientations: mastery oriented help seeking, performance-approach oriented help seeking, and performance-avoid oriented help seeking. Mastery oriented help seeking is done to gain an increased understanding of a topic or increase one’s own skill. Performance-approach oriented help seeking is done to demonstrate one’s own ability and often driven by a desire to be evaluated positively, particularly by peers among students. The final of the three, performance-avoid oriented help seeking, is done in order to avoid negative judgment by others. This desire to avoid negative judgments has been linked to vulnerability and low self-esteem and a perception of threat when help-seeking [8]. Marchand identifies similar motivations for help-seeking, which she categorized as being related to intrinsic or extrin-

sic factors. Intrinsic factors included “curiosity or inquisitiveness” and a desire to improve one’s own ability, while extrinsic factors emphasized how one is perceived in front of others. [9].

When moving from motivations to behaviors, Ryan *et al.* identified three categories: appropriate, avoidant, and dependent help seeking [7]. Appropriate help seeking refers to seeking help when truly needed. Avoidant help seeking refers to avoiding help seeking altogether when needed even though it is needed. Although this definition applies regardless of context, for the purposes of this study the definition was modified to contextualize avoidance with a specific relationship, such as the instructor of a particular course. The final category, dependent help seeking, refers to seeking help as soon as a challenge is encountered without much effort put into solving the challenge by oneself.

Regarding specific help seeking behaviors, Kitsantas and Chow identified a typical progression after the student recognizes a need to improve their performance [10]: (1) trying harder, (2) seeking informal help from peers, (3) seeking formal help from instructors or other institutional resources, (4) lowering aspirations or decreasing workload, and (5) making more drastic changes, such as changing majors or schools. Of particular relevance to our work is the prioritization of peer support over instructor support when help is needed.

III. METHODS

This preliminary study was conducted in the summer of 2021 as part of an NSF-funded Research Experience for Undergraduates program. The study design used a phenomenographic approach to characterize the variability in help seeking behaviors using individual semi-structured interviews [11, 12]. The interview protocol was developed using the broad range of factors identified in the literature as influencing help-seeking: the classroom environment (e.g., what do you do to avoid embarrassing yourself in class?), student beliefs and attitudes (e.g., What image or ideas come to mind when you think of a student who is invested in seeking help?), social climate and relationships to peers (e.g., how do you decide whether or not and which peers you ask for help?), thoughts about a professor (e.g., what reasons would cause you to seek or avoid an instructor for help as opposed to a others?), and other factors (e.g., what keeps you from asking for help?).

To recruit students, emails were sent to science departments in three undergraduate institutions as well as through a community of summer undergraduate research students. We received seven positive answers. Our sample included 4 physics majors (2 women and 2 men) and 3 life science majors (all women). Participants came from 5 different institutions (3 students from PhD granting institutions and 4 from bachelor’s granting institutions). Six participants identified as white and one as Asian. Six were rising seniors and one a rising junior. The students came from five different public and

private institutions in the Midwest and Mid-Atlantic regions. Our sample was limited by available time during the summer research program during which this data was collected.

Participation incentives were offered in the form of \$5 gift cards. Each interview was recorded and auto-transcribed within Zoom. Errors and punctuation in the automatic transcripts were corrected and qualitative analysis of the transcripts was executed using Dedoose software [13]. We began the data analysis process by reading each transcript to immerse ourselves in the data. Then, we applied a priori codes (e.g., peers, instructors, help-avoidance) as well as “initial codes” that gave short descriptions about what was unique in each particular excerpt. These codes were then grouped into larger categories that represent the themes in the results section (e.g., peer ability and work ethic or instructor availability). Once we have done this for all the quotes, we wrote robust descriptions of each code. In this phenomenographic study, we focused on a small number of students and identified types of ways that they seek help and their attitudes toward the specific help-seeking behaviors.

IV. RESULTS

The results are divided into separate subsections for each research question. Research Question 1 asks, who do undergraduate STEM majors seek help from, what determines why they choose these individuals and what determines this choice? Research Question 2 addresses the individual attitudes held by students and asks how they are linked to specific help-seeking behaviors, such as help-avoidance.

A. Results on research question 1

Who do students seek help from any why? Among the first questions posed to participants was from whom they first sought help from. This was followed by a series of questions asking why the student chose to seek help from these individuals and then in contrast what might cause them to not seek help from other individuals. Participants spoke to different characteristics and behaviors displayed by different instructors and peers that either encourage or discourage them from seeking help.

Peers. Most of the participants (6 out of the 7) stated that peers were the individuals they chose to seek help from first. This aligned with prior research [8], and much of the dialogue surrounding the student’s choice of peers reflected the information from the literature as well. Peers were chosen based on traits that alleviated the perceived vulnerability of seeking help such as a fear of being judged. Participants stated that among the top determinants of whether to reach out to a peer for help were closeness to a peer and whether or not they felt the peer was judgmental of them or others. Participants also said a peer’s ability and work ethic were important. This final factor was unexpected given its absence from discussion in

background literature, especially when observing the amount of importance some participants placed on it.

Peer Ability and Work Ethic. Among the first questions asked in the interview protocol regarding seeking help from peers was “What characteristic helps you decide who to seek help from?”. Three of the seven participants said prior academic success or work ethic was the leading factor when deciding which peers to seek help from. One student said, “We all tell each other our grades or whatever, if I know someone has A’s all the time, then I’m more likely to ask them”, and another said, “typically I go to people that I would say, like sort of give off the sense that they are hardworking and like care about what they’re doing.” Perception of a peer’s low work ethic could discourage a student from seeking help as well. For example, “I wouldn’t usually like go to someone who doesn’t really give off the sense that they don’t like care about the work or that maybe they haven’t done it yet.” From our data, it is unclear if any bias or stereotypical assumptions affected how students’ evaluate who “gives off the sense” that they are doing well or are hard working.

When asked how participants identified high performing and hard working peers, one participant stated, “people who answer questions in class like stay after to talk with the professor. Yeah I think paying attention, like them engaging in class is one of my biggest signs.” This was expanded upon by the same participant who also acknowledged behaviors outside of the classroom, such as involvement in student organizations, as indicative of a peer’s ability and work ethic. “If someone’s involved on campus I usually think that they’re involved in their studies as well and are caring about things. And I usually feel like I can ask them for help pretty easily because there’s a relationship there or a commonality that we like to be engaged in class.”

In addition to prioritizing peers of high ability or work ethic, some participants identified choosing peers who they felt had similar ability and understanding of coursework to themselves. The phrase often used by participants when describing this trait in peers was whether or not the peer was “on the same level.” Perhaps best described by one student when asked about their choice of whom to seek help from, “I would feel more comfortable asking someone who’s like at my level in the class like doing the same assignment as me.” This rationale was often a determinant when deciding to seek help from peers over instructors. Described by another student when stating why they choose to seek help from peers, “I trust their explanations more than a professor, because I feel like they’re more on my level and especially if it’s like a homework assignment that they’ve already done and like figured out, like, they’re using skills that we’ve like both learned.”

Peer Closeness. A response given by most participants in some capacity was that when seeking help from peers they considered how close they were to a peer before choosing an individual. Many participants stated this was the first thing they considered when reaching out for help. Peers selected tended to be roommates and friends, as was the case with one student: “I probably [reach out] the most [to] my two room-

mates. They're also physics majors so I'm definitely most comfortable asking them for help, because we're like really close you know." Some students who prioritized ability and work ethic still said, "I wouldn't usually [seek help] unless I'm like super close friends with this person."

A key part of this closeness was defined by whether a participant and peer interacted outside of the classroom. Participants described having regular interaction outside of an academic setting with a peer as a key contributing factor to why they decided to reach out to a given individual. "I'm definitely most comfortable with them because I've kind of gotten to know them outside of the classroom and we're, like, already close and, like, have a relationship so it's not as much pressure." Another participant stated, "I think I'm more comfortable with the peers just in general, because we're friends, we hang out, we have meals together, that type of stuff." Furthermore, lack of closeness was cited as a deterrent from seeking help from certain individuals. In the words of the same participant as before, "I kind of find it hard to ask like *just* classmates for help since we aren't close, like we're not just naturally helping each other already, so it's kind of like me asking them for help that's like our only relationship."

Instructors. Only one of the seven participants stated that instructors were the first individuals they sought help from. The other six participants stated that they either reached out to instructors after peers were unavailable or unhelpful, when "all else failed", or avoided seeking help from instructors altogether. Multiple participants additionally stated that they did not enjoy seeking help from the instructor, feared doing so, and sometimes actively avoiding doing so. Considering that students rarely go to professors as an early course of action when seeking help, these factors that encourage or discourage students from approaching instructors become all the more important.

Instructor Availability. One prevailing factor that participants stated determined whether or not they sought help from an instructor was the availability and how easily they felt they were able to reach the instructor. Participants stated that this sense of availability was often expressed through behaviors that made seeking help from an instructor "more convenient." This included behaviors such as staying after class. One participant stated, "professors not rushing away after the class ends, who invite students to stay after and ask questions if they need...that's usually pretty helpful." Availability also included whether a professor could typically be found in their office or the department at some given time. One participant appreciated professors who "encourage you to come into their office hours and whenever you do they don't treat you like you're taking up their time, or wasting their time, or acting like you're a burden. So I'd say they're a good, well, great help, actually."

Lack of availability because of conflicting schedules kept some students from taking advantage of office hours. In the words of one participant, "one thing that definitely keeps me from seeking help from professors is like just their availability...their office hours usually don't match up with whenever

I'm available." Students appreciated when instructors were willing to hold office hours at times that were convenient for them. Yet faculty attempts to convey availability may unintentionally communicate a lack of desire to meet with students. "I know, like, there's some professors at [my institution] outside of science, that have told me like don't contact me past five I won't like answer your emails and so forth but I don't think I had a professor in the biology department like that yet... I'll email [a biology professor]... and they'll like give me times they're available and we'll figure it out within the day."

Whether an Instructor Seemed Judgmental. Several participants stated that witnessing past situations where a professor appeared judgemental deterred help seeking. One student said, "for specific instructors, it would be how they answer questions in class can sometimes sound condescending. So then I don't ask those professors questions." This included response statements from professors such as, "that doesn't have anything to do with anything" or "how don't you understand this?" Perceived condescending behavior was identified outside of the classroom, too. "There have been times, where I've like gone into their office hours and like, I would ask questions that were super simple and they'd be like, 'well, I was talking about this in class and so forth,' and I'd just be super embarrassed. And so... Next time I would need help from them, I would just sort of be like, no, I'm probably okay without [going to them for help]."

Whether an Instructor Appeared Research or Teaching Focused. Another factor that influenced help-seeking was whether the instructor gave the impression that they were predominantly focused on pursuing research or teaching. There was a split among participants who stated their department was primarily research focused and those who said their department was focused on teaching (there was one participant out of the 7 who said they were unsure).

One participant, when asked whether there was anything they wished was different about their department that might make them more likely to seek help, responded with, "I don't know if there's anything that would make me seek help more, but one thing I do wish is that... The professors focused more on teaching, rather than just research." Upon being asked the same interview question, another participant said, "for a lot of [professors], it's just a requirement of their jobs that they can do research at a university. And so I think if professors showed more, like, interest in teaching and students' learning, then I would probably be more inclined to ask for help."

When asked what ways a professor might display this research focus, one participant commented on the professor's teaching style: "they all think lecturing is the one way to do it, and the best way to do it, and no one really has seemed to give any thought otherwise." Another student perceived a lack of effort among research-focused faculty, stating, "... They just don't care at all. They don't help their students. They barely focus on the classroom. They just like go in and go through the motions."

B. Results on research question 2

What attitudes were linked to specific help-seeking behaviors? In addition to traits of peers and instructors that encouraged or discouraged seeking help, we also sought to identify internal attitudes that may also affect help seeking. Much of the data we used to answer this second research question was not specifically prompted and was identified within participants' discussions about seeking help from instructor and peers. We separated attitudes into two categories: those that led to avoiding help and that led to seeking help.

Feeling vulnerable led to help avoidance. Many participants acknowledged the first reason they might not reach out for help was out of fear of embarrassment or not wanting to seem dumb. Fear of help seeking was described when talking about seeking help from both peers and instructors, however this fear was most commonly linked to those in authority, such as professors, or those perceived as having high performance. Described by one student, "there's definitely like a set of people that I think are like smarter than me and I don't want to appear dumb in front of them, especially like to a professor." Another stated, "I am more scared of embarrassing myself around TAs and professors and because they're the ones who are going to be assigning a grade to me."

A key reason for this fear of embarrassment was the risk of revealing one's lack of knowledge. Best described by one participant, "It makes you not want to reach out to them because then you feel like you're, like, decreasing what you seem to be knowledgeable on, if that makes sense. Or, if you think that they think highly of you, you don't want to be like, 'oh, yeah, I don't understand anything.' So I think that will make it less likely for a person to reach out to that professor."

Confidence and Pride in One's Ability. There was a set of participants who stated another large reason they did not seek help was that they felt they were able to solve their problem themselves and took pride in being able to do so. This attitude was first seen in the early part of the interview protocol when asked what they did first when encountering a roadblock. Some students said that seeking help was a "last resort" or done when "all else fails." Described by one participant, "I don't usually reach out to people. I find it's usually like a very last resort if I can't figure something out the last thing I do is reach out to somebody."

Another participant stated, "I sort of take pride in my own ability to solve things. And so, if I can't problem solve and reason through it myself [and] need to go to somebody else, I don't really like that." Other students echoed this sentiment. Similarly, some students were only willing to ask for help once they'd tried. "As long as I've given it a fair effort myself, then I'm perfectly content with asking for help. But I need to put forth effort, before asking for help." However, some participants acknowledged the downside to this attitude, with one stating that, "I always feel like I'm like on the verge of understanding things you know, so I spend a lot of time trying to figure it out myself, and I don't really make a lot of

progress." Avoiding help because of an overzealous desire to persevere can lead to insufficient progress.

V. CONCLUSION

This preliminary phenomenographic study aimed to capture factors that influence undergraduate students' help seeking behaviors, which in turn impact students' academic success and retention. We now consider implications of our results for instructors, departments, and students. While our sample was small, we believe these factors are worthy of continued investigation.

Our results suggest the importance of instructor availability and particular behaviors, such as staying after class to answer questions and working around students' schedules. Likewise, instructors should avoid discouraging comments, even small ones, that suggest helping is a burden. Efforts by instructors to set reasonable expectations (e.g., I won't respond after 5 pm) may inadvertently send a message to students that they shouldn't reach out after hours (or at all). We suggest accompanying such expectations with other encouraging statements. Research active faculty may want to explicitly communicate that teaching is not a burden and that they care about teaching and their students' success.

Our findings related to instructor judgmentalism suggest that instructors should be aware of the content and tone of how they respond to students in classroom and one-on-one interactions. Due to the power imbalance between students and instructors, students may be more likely to interpret faculty remarks as condescending or demeaning. Students' high-level of concern expressed around "looking dumb" in front of the professor suggests that many students are sensitive to their instructor's response. Instructors could focus on creating a supportive classroom environment that fosters openness of questions to the instructor and between peers.

Lastly, because help seeking was more frequently sought from peers with a close relationship, it shows the value of fostering community in the department. This includes making time and space outside of the classroom for students to interact informally or through formal events, to develop friendships, and to form study groups among students with diverse levels of experience.

While the interviews and analysis revealed factors that encourage or discourage seeking help, our interview protocol did not provide sufficient information to tell whether the help seeking was appropriate. There could also be differences in self-reported help seeking versus other kinds of observation. Future work could strengthen our preliminary findings by including a larger population with more diverse demographics and a wider range of years of study. Finally, more work could be done to explore the link between help seeking and other psychosocial constructs, such as self-efficacy, physics identity, or sense of belonging, as well as with long-term outcomes, such as retention in a physics degree program.

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