



Investigating Students' Perspectives on the Value of Help-Seeking Resources in CS Education

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ABSTRACT

The accessibility and effectiveness of help-seeking resources plays a pivotal role in contributing to the success of students in Computer Science courses. However, students do not always choose to utilize these resources, and when they do, their experiences can vary. While some students commend help-seeking resources for effectively providing clarification on assignment instructions, debugging code, and addressing questions about course concepts, others share instances where their problems were not resolved, or, in some cases, they did not receive any meaningful guidance from these resources. In this study, we examine the experiences of students enrolled in a CS2 course, all of whom had access to the course's help-seeking resources. These experiences were gathered through qualitative interviews at three time points within a semester. Our findings, derived from emergent coding, reveal thematic patterns in student encounters with help-seeking resources and contribute to a broader theme regarding help-seeking resource utilization at different phases of the semester. The findings of this investigation contribute to the wider conversation on student success and help-seeking resource utilization in Computer Science education.

CCS CONCEPTS

• **Applied computing** → **Interactive learning environments**; • **Social and professional topics** → **Student assessment**.

KEYWORDS

CS2 course, academic help, help resources, office hours, online forums

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1 INTRODUCTION

In the dynamic landscape of computer science (CS) education, the role of help-seeking resources has become increasingly pivotal to shaping students' learning experiences. As the demand for computational skills continues to surge, and CS enrollment increases [26], educators are tasked with preparing students for success in a field that constantly evolves. Students are initially exposed to course materials through lectures, which can be live or recorded, and they engage with these materials by completing course assignments. Whenever students encounter questions or challenges related to the material or an assignment, their learning journey continues as they seek academic help [9].

Common help-seeking resources include traditional office hours, where students can interact with the teaching staff in real-time [20]. The teaching staff generally consists of instructor(s) in charge of administering the course, while potentially having the support of tutors or teaching assistants [14]. In addition, online discussion forums have gained popularity in higher education as an asynchronous way for students to receive help from the teaching staff and other students [23]. While students can utilize additional resources like API documentation, programming practice materials, and emergent help-seeking tools like generative AI exemplified by ChatGPT [7], these resources may be restricted or not approved for use in a course.

This research delves into the students' perspectives on the value of the commonly approved help-seeking resources (office hours and an online discussion forum) within the context of CS education. Understanding how current students perceive and engage with traditional help resources is crucial for educators and educational institutions seeking to optimize modern learning environments. With the increasing CS enrollment creating more demand for student support, there is a necessity to explore the impact of help-seeking resources on students' academic journeys and the development of essential problem-solving and critical-thinking skills. The goal of this study is to *uncover the prevalence of approved help-seeking behaviors among CS students and the factors that influence their decision to seek help through traditional help-seeking resources*. This study seeks to provide insights for educators dedicated to fostering effective and supportive learning environments in CS education.

To evaluate how students value help-seeking resources, we collected data using qualitative research methods in a CS2 course at a public research-intensive university in the southeastern United States and we seek to answer the following questions through this investigation:

RQ1: How do students define help-seeking resources, are they aware of help resources, and how do they utilize them for completing CS2-level programming projects?

RQ2: What factors contribute to the utilization of help-seeking resources during the completion of CS2-level projects?

2 RELATED WORKS

2.1 Office Hours

Office hours offer students the chance to receive synchronous assistance from the teaching staff, including both instructors and Teaching Assistants (TAs). The support provided by TAs is a valuable resource for students in various disciplines, capable of reducing withdrawal rates and enhancing retention in subsequent courses, benefiting both students [21, 22] and TAs [8].

Software tools have been developed to handle and gather analytics on the utilization of office hours [16, 20]. Through analytics derived from the *Queue* tool, Ozymko et al. [16] it was discovered that 20% of the students in a course pose 82% of the questions. Additionally, 64% of the students utilized office hours, with a subset of students having notably more interactions during office hours than their peers. The analysis also revealed that students who attend numerous office hours tend to perform well on graded assignments, although this doesn't necessarily translate to success in proctored exams.

Ren et al. [18] examined surveys conducted before and after office hours interactions to categorize the types of questions posed by students during office hours and their alignment with the steps of the Design Recipe [3]. The analysis revealed that students commonly inquired about the implementation of a function and the testing of its correctness. TAs, on the other hand, often reported that the actual interactions encompassed various steps of the Design Recipe, typically involving understanding the problem and the data definition. This underscores the effectiveness of TAs in guiding students to focus on the correct aspects of the problem.

Smith et al. [20] conducted an analysis of office hours interactions using data recorded through the MyDigitalHand (MDH) tool. Similar to Ren et al. [18], the MDH tool solicits details about the problem the student is encountering and gathers feedback from both the teaching staff and the student regarding the success of the help interaction. The research revealed that fewer than 50% of the students availed themselves of office hours. Among those who attended, 5% of the students accounted for 50% of the office hour time.

Gao et al. [4] delved into the usage patterns of in-person versus virtual office hours within a similar CS2 course. The findings indicated no discernible relationship between office hours participation and course performance. However, it was observed that students with low confidence or low enjoyment toward computer science exhibited increased activity in virtual office hours. In a separate study, Morgan and Robinson [15] identified significant variations in students' help-seeking behavior based on gender, ethnic background, and status.

Numerous experiments have explored the implications of hosting these sessions online. In Fall 2007, Malan [11] introduced virtual office hours to Harvard College's introductory computer science

course and noted attendance levels comparable to those of traditional, in-person office hours. In contrast, Gao et al. [5] findings suggested that online office hours reduced barriers to student attendance, thereby increasing the demand for office hour assistance, which subsequently influenced wait times and throughput.

2.2 Online Discussion Forum

Online discussion forums provide students the mechanism for asking questions asynchronously while they are actively engaged in their work. Students may feel lower pressure [25] and encounter fewer social barriers [17] to asking questions by using discussion forums, especially when they can appear anonymous to peers. The use of online discussion forums may even contribute to improved outcomes in CS [24].

Vellukunnel et al. [23] found that most student help-seeking activities in CS involve *constructive* questions related to finding and fixing faults in their programs and that asking constructive questions is correlated positively with course grades. Additionally, they found that 81% of students in introductory CS courses between two institutions posted at least once to the online discussion forum (Piazza) and that over 99% of the students viewed the posts [23]. Mihail et al. [13] found that students who scored better in a class post more to the discussion forum than students who scored worse in a class.

2.3 Help-Seeking for Course Projects

While not delving into each individual assignment, Ren et al. [18] the Design Recipe framework enables a more refined classification of interactions based on assignments. Ozymko et al. [16] utilized log files from an online queuing system and students' scores on graded assessments in a preliminary study, offering an initial analysis of the correlation between course assessments and office hours. Key findings included a positive correlation between office hours attendance and upcoming graded homework, but not with exams. Additionally, the overall impact on a student's course grade from attending office hours decreased as the student's attendance proximity to an assignment due date or exam date increased.

Shifting focus to alternative help-seeking resources, Akintunde et al. [1] explored the usage of online discussion forums at a class level, discovering an increase in usage as assignment deadlines approached. They also observed heightened usage corresponding to different milestone deadlines within larger course assignments. Similar behaviors were noted by Sheshadri et al. [19] in an examination of online study habits in two computer science courses, reporting increased browser activity for resources like forum-version control, learning management systems, and the homework system.

3 METHODS

3.1 Course Context

The data for this IRB-approved qualitative study was collected from a large, public, research-intensive university in the southeastern United States. The focus is on a CS2 course, the second in a three-semester sequence for CS majors and minors. The course includes two 75-minute lectures per week and a required 110-minute lab. The course is taught in Java and covers advanced object-oriented

programming concepts, software engineering principles, implementation and use of linear data structures, and recursion.

3.1.1 Projects.

Guided Programming Projects: The course begins with three guided programming projects, serving as a review of prerequisites and an introduction to new tools and concepts. These projects contain guided and independent tasks, with two-week deadlines. Students gain skills in test-driven development, source-level debugging, and proficiency in GitHub and Jenkins for version control and continuous integration tools.

Programming Projects: After the three Guided Projects, the students are tasked with completing two multi-part large programming projects. These projects are divided into two parts:

Projects Part 1: the students propose a design and system tests based on a provided problem statement and set of use cases. The students assume responsibility for making decisions regarding their proposed design while constructing a UML class diagram that represents their solution's structure. Students are also tasked with providing a rationale for their proposed design in an essay-style report that accompanies the class diagram. Students typically have one week to independently complete Part 1.

Projects Part 2: the students implement the teaching staff's design for the project over three weeks, with two weekly milestones to aid in time management and a final deadline. By the end of the first week, students create a commented project skeleton, including all source and test classes. Students are encouraged to start documentation early to better understand class and method implementation later. The skeleton should compile error-free against staff tests and not trigger Checkstyle [2] errors. By the end of the second week, students are expected to obtain at least 60% statement coverage on each non-UI source class. This grants students access to teaching staff test results. The completion of this milestone provides feedback for debugging and fixing student implementations. All project work must be submitted on GitHub by the third week for semi-automated evaluation and feedback. Note that Project 1 Part 2 is independent, while Project 2 Part 2 allows optional pairs.

3.1.2 Help-Seeking Resources.

In this course context, students ask for help either asynchronously through the online discussion forum, Piazza [23], or synchronously by attending office hours.

On Piazza, a student can post a question on the *forum* detailing the issue they are facing. To aid the teaching staff, students can upload relevant images, errors, and links to their work. Within the online forum, students have the choice to submit questions privately, ensuring that only the teaching staff can view them. Students may also opt for anonymous posting where everyone can view the posting but the student's identity is only disclosed to the teaching staff.

Office hours are conducted online through Zoom and managed with the MyDigitalHand (MDH) tool [20], a web-based queuing system. Students can log in, raise their hand, and answer an entry survey describing their issue. This creates a help ticket and adds them to a queue. A member of the teaching staff then accepts a ticket from the queue, notifying the student to join that staff member's Zoom meeting. After assisting, the staff member marks the ticket complete and answers follow-up questions about the

interaction. The student also answers questions about the quality of the interaction and can re-enter the queue if they need further assistance.

In addition to these help resources, this course also has an *online textbook* that students use as a supplemental resource. There is a *support email* address that students can email that will alert the entirety of the teaching staff. Additionally, there are *practice coding resources* that are available to students to aid in improving their application of course concepts via small coding problems. Finally, students are allowed to reference the *Java API* documentation for programming help. All of these help-seeking resources are advertised in weekly emails and mentioned during lectures.

3.2 Data Collection

The data sources in this study come from Fall 2023 and include a *project reflection form* and student responses gathered during 44 *semi-structured one-on-one interviews*. The project reflection form is a Google form that helped students reflect on what went well and what did not go well with their most recent programming project. The interviews, conducted after each major project submission, focused on students' project performance, help-seeking resource awareness, and resource utilization. The three guided projects were grouped as one major project.

Students first filled out the project reflection form which was administered as an in-class exercise, graded for completion, after the submission of each major project in the course. Table 1 contains the breakdown of the number of reflections submitted, the number of students invited to be interviewed, and the number of interviews conducted. There were a total of 610 reflections submitted by 361 students across all three major programming projects.

Table 1: Project reflections, Invitations, Interviews. (n = 361)

	Guided Projects		Project One		Project Two	
Reflections Collected	190	52.6%	276	76.5%	144	39.9%
Students Invited	95	26.3%	100	27.7%	35	9.7%
Interviewed Students	19	5.3%	18	5.0%	7	1.9%

Once reflections were collected, students were stratified based on their answers to the following question: *Do you attend office hours when you need help with assignments?* This question was the most representative measure of their help-seeking usage that could be obtained from the project reflection form. From these five strata, 10 students were selected at random to be invited to be interviewed after each major project. If too few students volunteered to participate in the interview process, the process was repeated to identify another 10 students to invite.

For the 44 interviewed students, the office hours usage was (1) Never - 15.9%, (2) Rarely - 18.2%, (3) Occasionally - 13.6%, (4) Sometimes - 11.4%, and (5) Always - 40.9%. The 30-min interviews took place from Week 10 to Week 16 in the sixteen-week semester. Each set of interviews is termed an *interview touch point*. Interviewed students earned one extra credit point toward either their first or second midterm exam.

3.3 Participants

This study includes data about students in the CS2 course from the Fall 2023 semester. Participants were 18 years of age or older and gave consent for the de-identified usage of their course metrics and interview dialogue. De-identification involves replacing identifiable information with a unique identifier. Each student was given a Westernized gender-neutral name such as 'Sam' in place of their real name. The individual interviews were held virtually through Zoom where video was disabled. Audio recordings and interview transcriptions were kept secure in a private Google Drive and de-identified to all but the principal investigators.

3.4 Thematic Analysis

We applied thematic analysis to the responses students gave during their one-on-one interviews [6]. This process involves coding qualitative data and condensing it into common themes to analyze captured dialog in participant interviews [10]. All 44 interviews were coded to identify themes related to students' awareness of help-seeking resources and their perceptions of these resources. Responses could be associated with more than one code.

The four-step thematic analysis process included: (1) Reviewing data and resolving errors, (2) Coding the first touch point's interviews and reviewing emerged codes, (3) Coding the remaining two touch points, and (4) Grouping codes into themes and addressing any anomalies. This coding process was initially conducted by a single researcher. After completion of this process, 20% of the responses were randomly selected from each of the three touch points and assigned to the other two researchers. Using the existing code book, they re-coded the responses and a comparison was done for similarity against the original coding. We computed kappa to measure the inter-rater reliability for the re-coded responses, obtaining a value of 0.88. [12]

4 RESULTS

4.1 RQ1: Awareness, Definition, Utilization of Help Resources

To answer our first research question, we focus on the responses to the question: *Are you aware of the help-seeking resources available to you?* The answers to this question can be seen in Table 2 which shows the percentage of students aware of the various help-seeking resources offered to them. Across all three interview touch points, the majority of students identified office hours and the discussion forum as help resources. Some also mentioned the support email, the online textbook, and resources with coding problems for extra practice. Students are primarily aware of the traditional office hours and discussion forum resources but do not immediately recognize the textbook, email support, or additional practice resources as a help-seeking resource.

After answering the question on resource awareness, students were provided with the full list of available help-seeking resources by the interviewer to aid them in answering future questions regarding usage. The intent was to enhance students' ability to recall accessed resources during their multi-week programming projects at the time of the interview. A factor in how students perceive the

Table 2: Awareness of help-seeking resources

Aware of	Guided Projects		Project One		Project Two	
Office Hours	17	89.5%	18	100%	7	100%
Discussion Forum	19	100%	17	94.4%	7	100%
Email	5	26.3%	2	11.1%	2	28.6%
Textbook	1	5.3%	0	0%	0	0%
Practice Resources	2	10.5%	0	0%	0	0%

help-seeking resources available to them is how they define what a help-seeking resource is. We asked them: *How would you define a help-seeking resource?* We list the top four themes here, ordered by the frequency with which students identified these characteristics.

Assignment Help - 29.5%. Students define a help-seeking resource as any assistance in completing assignments. Palmer describes it as *"anywhere to go when you are stuck on a problem and can get an extra set of eyes to help you out."* Colby said that a help-seeking resource is *"somewhere you could get help in understanding concepts for a class or help with individual assignments."*

Instructor Assistance - 18.2%. Students define a help-seeking resource as a resource that involves direct assistance from the teaching staff. Presley defines it as *"anything you could just go to an instructor or TA to look over something you have done or have a second set of eyes to look over what you have done in terms of your work."* Jules' combines multiple characteristics in their definition stating that a help-seeking resource is *"a resource that a student can go to if they are struggling on an assignment, or need clarification in any way. It's usually like from some instructor or TA, or somebody with some authority who knows what's going on."*

Understanding Course Material - 15.9%. Students define a help-seeking resource as a resource that aids in gaining a deeper understanding of course material. Colby highlighted accessing resources for further mastery. Ash defines it as *"something that helps us move forward in grasping concepts that they (students) might not know as much about to help them succeed."* Sidney expands upon this characteristic, defining a help-seeking resource *"as something that is an efficient resource that helps bring understanding quickly while also helping you learn something from the experience."*

Course-Allowed - 4.5%. Another characteristic that was identified by students is that a help-seeking resource should be one that is allowed by the course and does not violate the academic integrity expectations in the course syllabus. Cedar defines a help-seeking resource as *"anything that a student can go to that won't be a direct violation of academic integrity, and will assist them in their project or correcting a test or whatever it is."*

Students primarily define a help-seeking resource as a resource that helps them with completing their course assignments. It can also be a resource that connects the student to a member of the teaching staff and it can lead to a better understanding of the course material. As seen in Table 2, students are primarily aware of office hours and the discussion forum. These two resources help students with assignments, connect students to the teaching staff, and aid the student in better understanding course material. These resources are also allowed by the course. Emailing the teaching staff, reviewing

the textbook, and visiting practice resources were not as recognized and this can potentially be explained by how the student defines a help-seeking resource. Practice resources and a course textbook do not connect the student to the teaching staff and they do not directly help with their assignment, but they do aid in understanding course material and they are course-allowed. Students' awareness of available resources as help-seeking resources is influenced by how they define a help-seeking resource.

During the interviews, we also asked students *Did you utilize any help-seeking resources during the completion of this assignment?*. Table 3 shows the percentage of utilization across all help resources at the three different interview touch points. Students are prioritizing the usage of instructor-assisted resources such as office hours and the discussion forum over other beneficial resources that lack this characteristic, such as API documentation.

Table 3: Students utilization of help-seeking resources

Utilization	Guided Projects		Project One		Project Two	
Online Discussion Forum	19	100%	18	100%	7	100%
Office Hours	10	53.6%	10	55.6%	5	71.4%
Java API Documentation	6	31.6%	5	27.8%	2	28.6%
Lecture Materials	2	10.5%	7	38.9%	3	42.9%
Textbook	3	15.8%	5	27.8%	1	14.3%
Practice Resources	2	10.5%	1	5.6%	1	14.3%

4.2 RQ2: Factors Impacting Help Utilization

During the interviews, we asked students to elaborate on "What factors contribute to or deter them from utilizing office hours and the online discussion forum as a help-seeking resource?". Students were also asked if "Is there anything specific about office hours and the online discussion forum that made you choose one over the other?".

4.2.1 Factors of Office Hours Usage.

Lack of Necessity - 22.7%. Ten students cited a lack of necessity as a reason for not utilizing office hours. Among them, six students were interviewed for their Guided Projects and noted that the guided portions were sufficient in helping them complete the assignment. When questioning Taylor on what factors contributed to their non-usage of office hours during the Guided Projects, they replied "It was just nothing motivated me to do it. I felt like I could get the work done on my own and didn't need the extra help from office hours." With the absence of guided portions in Project 1 and 2, students attend office hours more often. However, when working on Project 2, Reagan said that "I guess I would say because to some extent I felt like I didn't really need it and I just kind of wanted to go through the challenge on my own."

Face-to-Face Assistance - 36.4%. Sixteen students identified the value of being able to meet with the teaching staff face-to-face. While Drew was working on Project 1, they said that "I prefer the human interaction. I prefer having to like personally explain my problem to someone, because I feel like I am not the best when it comes to writing down what I need help with." These students value the synchronous help received in office hours over the asynchronous method of using the online discussion forum.

Long Waiting Times - 47.7%. Twenty-one students identified the long queue times that sometimes occur as assignment deadlines approach discouraged them from attending office hours. When discussing what factors contributed to them not using office hours, Dakota stated "But really the wait is too long, like I had to wait for over an hour for the office hour, and I just feel like if every time I need to block off like an hour or more of my time to just get in touch with a TA I think it will just be more efficient to just post some Piazza post or reference other people's questions on Piazza."

Debugging Assistance - 56.8%. The primary driver for attending office hours is the need for code debugging assistance. Sidney, while working on Project 1, says that they seek office hours help when they have "...a bug that I have been working on for many many hours." Casey says that they seek help "mainly for teaching staff failures". Jamie says that they attend office hours "Whenever I get stuck on a piece of code and I cannot think properly on what I need to do to be able to solve it..."

4.2.2 Factors of Online Discussion Forum Usage.

Office Hours Timing - 27.3%. Twelve students report that they tended to go to the discussion forum whenever they were not able to access office hours. Cameron reports that "The discussion forum is what I use when there are not any office hours available, or when there is too many students in the office hours." Blair says that "Some of the office hours the wait would be like incredibly long. So it was just sometimes the faster way to seek help".

Good for Quick/Clarifying Questions - 34.1%. Fifteen students identified that the online discussion forum is better suited for getting answers to small questions or clarification questions about current assignments. Cameron states that they choose the discussion forum if "it is just a small issue that I need clarification on". Avery reports a similar experience saying that "if it's like a more general question that a student could answer then I don't have to waste my time by going to office hours".

Searchability and Peer Communication- 72.7%. Thirty-two students noted the value of being able to search through existing posts from peers facing similar issues. Kris noted the advantage of communicating with peers on Project 2, stating "The other students kind of having the same issue and its like, obviously you can't get 300 people's phone numbers. So it (Piazza) is a way to communicate with people to see if they have the same issue and get help on record and have something to look back on instead of trying to remember what was said in office hours". Jesse, debugging in Guided Projects, mentioned "after a little bit, if I have tried debugging and I can't quite figure out something I may go on piazza and see if someone else has ran into a similar problem".

5 DISCUSSION

5.1 Student Definition, Awareness & Utilization

We found four characteristics that students identified that define a help-seeking resource.

- **Assignment Help,** Students identified a help-seeking resources as anything that could aid them in completing their course assignments.

- **Instructor Assistance.** Students connected a help-seeking resource with the idea that it is a resource that allows you to receive direct assistance from an instructor or another member of the teaching staff.
- **Understanding Course Material.** Students recognized a help-seeking resource as something that could assist them in growing their understanding and mastery of the course concepts and learning material.
- **Course-Allowed.** Students recognized that any valid help-seeking resource is one that is allowed by the course and does not violate any academic integrity standards.

The majority of the students are more aware of help resources that offer direct instructor assistance; prioritizing office hours and the online discussion forum over the available textbook and practice resources. Students are not taking advantage of all of the resources available to them to seek help while working on course assignments. Depending on the course context this could mean placing more emphasis on documentation, textbook chapters, or practice problems that aid students in learning the material surrounding a particular course assignment. Every interviewed student indicated accessing the online discussion forum while working on their programming projects. Office hours were ranked as the second-most utilized resource, followed by Java API documentation and other learning resources. Based on our findings, students are primarily associating help-seeking resources with connections to the teaching staff, overlooking the value of other resources such as lecture materials, textbook readings, and API documentation as a viable help-seeking resource.

5.2 Factors of Help-Seeking Resource Utilization

Students reported that office hours was extremely valuable for receiving assistance in debugging failing code. These students appreciated the synchronous nature of office hours, allowing for immediate interaction with the teaching staff for real-time problem resolution. Students who had a high level of self-efficacy and are confident in their programming ability reported not attending office hours for assistance. This is evident in testimonies from both Taylor and Reagan. Both students highlighted that they had no need to attend office hours for help and wanted to get through the challenges on their own. Additionally, large office hours queues and long wait times lead to a belief that joining the queue to seek help is futile as students would not receive help before the teaching staff's office hours ended.

Students also value the online discussion forum for its ability to view public posts from peers and narrow down posts through keyword searches. Some students acknowledge that they turn to the discussion forum when office hours are either not available or have a high number of students waiting to attend. They appreciate the option to post questions asynchronously and continue working while awaiting a response. However, some students acknowledge that the asynchronous nature can lead to slower response times, making it less suitable for students needing rapid assistance. The text modality can increase the chance of miscommunications between students and the teaching staff when resolving more complex problems.

5.3 Threats to Validity

The results of this study are constrained to a single CS2-level course in a large, public, research-intensive university in the southeastern United States. While there were 361 total students enrolled in the course, we were only able to talk with 44 of these students who may not be representative of the combined varied experiences that students have with academic help-seeking. Additionally, students were selected based on their response to a single question regarding their usage of office hours during their completion of the most recently submitted programming project. This paper's findings on resource utilization, in particular office hours utilization, are impacted by the marginally high 40.9% of students who were interviewed that stated they always attended office hours.

6 CONCLUSION

In this study we examine students' perspectives on the value of commonly approved help-seeking resources within the context of a CS2-level course. We identified four characteristics that students consider when defining a help-seeking resource. The characteristics that students prioritize in their own definition of a help-seeking resource impacts their utilization of available resources. Students working on programming projects tend to seek help from resources that connect them directly with a member of the teaching staff. Resources such as textbook readings, lecture notes, and API documentation are not as widely considered by students to be a help-seeking resource. The online discussion forum was the most popular resource, utilized by every student we interviewed. Students tended to utilize the online discussion forum as a secondary resource when office hours were not available or had too many students waiting in line. They noted that it was good for quick clarifying questions and valued the ability to search through existing posts for students having similar issues or questions. On the other hand, students prioritize office hours for help with debugging test failures or when they desire face-to-face assistance from the teaching staff. Instructors can utilize our findings in this course to better organize and advertise the help-seeking resources offered in their courses.

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