Not Built for Us: Marginalized Students' Visions for Help-Seeking in Computing Education

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Abstract

Motivation. Asking for help is an essential skill in computing. However, many students face barriers to help-seeking, such as not being aware of help-seeking resources, doubting the usefulness of resources, fearing judgment from their peers, or not wanting to rely on others for help. Prior work on help-seeking in computing contexts has not directly considered how to include student perspectives in the design of help-seeking structures. Moreover, marginalized students face additional challenges due to inequities they face in computing. Therefore, it is imperative to elicit the voices of students marginalized in the community to address all challenges students face.

Objectives. We aimed to understand what help-seeking structures marginalized students envision in computing, to inform the design of help-seeking structures that address both the challenges that broadly impact computing students and those unique to marginalized students.

Methods. We conducted a 5-hour futures workshop with 18 marginalized post-secondary students in computing majors. The workshop had 3 phases (*critique*, *fantasy*, and *implementation*) where students worked in groups to discuss their help-seeking experiences and ideas. We collected data through surveys, recordings, and field notes. We used inductive thematic analysis to analyze our data.

Results. We identified 5 themes from students' visions of their ideal help-seeking communities. Students discussed that they want help-seeking structures to 1) be more responsive to their needs and 2) be psychologically safe spaces. Moreover, they 3) wanted agency and autonomy to design their learning spaces, but also 4) to be free to practice and fail without any academic consequences. Lastly, students 5) wanted help-seeking to facilitate community building, which in turn creates support and joy.

Implications. Our findings indicate a misalignment between institutional norms and student's lives and the importance of utilizing student perspectives to critically reflect on how to address the challenges associated with help-seeking. This shows the need to create help-seeking structures that move beyond standardized support models.

CCS Concepts

• **Social and professional topics** → **Computing education**.

Keywords

Help-seeking, Futuring

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1 Introduction

Asking for help is a critical component of computing education because it enables students to monitor their understanding of course concepts, navigate challenges they face in a course [23], progress towards their learning goals [39], and build a skill they will rely on throughout their careers as software developers [4]. Students who engage in help-seeking perform better, make more progress in their assignments, and grasp material better [22, 47]. While seeking help, students must not only identify what resource to use, but also navigate course policies and norms. We refer to these resources, policies, and norms as a help-seeking structure.

Despite its importance, many students encounter barriers that prevent them from seeking help in their computing courses. Researchers found that students avoid asking for help because they fear judgment from people they seek help from [5], do not want to rely on others [8, 39], or doubt the benefits of seeking help [49].

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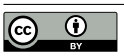

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Moreover, students may encounter policies that restrict the ways in which TAs can help them, causing students to isolate from the course [45]. These barriers indicate that students' help-seeking behaviors are not only dependent upon their socio-emotional fears, but are also influenced by their learning environments.

Creating effective help-seeking structures that address barriers requires us to utilize student voice in their design. Some prior work has identified characteristics of effective help-seeking resources that students prefer, such as timeliness, availability, and adaptability [26], as well as the value students place on human interaction when seeking help [8]. However, this work largely examines existing structures rather than directly asking students to radically envision what help-seeking structures they need.

While prior work has not sought students' visions for help-seeking structures in general, it has particularly overlooked the needs of students who are marginalized by their identities in computing. The few studies that have examined marginalized students' help-seeking behavior suggest they gravitate toward personal connections when navigating support in computing courses. Winograd and Rust found many historically underrepresented students in STEM are not aware of help-seeking resources that are available [51]. Computing education researchers found that Latine students rely on support networks outside of formal course structures [27]. More generally, marginalized students also face more acute challenges in computing surrounding belonging and self-efficacy, which may shape how and whether they seek help [21, 24]. These findings suggest that not only should research examine what visions students in general have for help-seeking structures, but that focusing specifically on the visions of students marginalized in computing might best reveal what structures can serve everyone. This follows from the more general epistemic claims of Black Feminist Thought, which argues that the deepest expertise on the failures of social systems and visions for how to re-imagine them often lives at a system's boundaries, where individuals live its failures daily and dream of alternate futures [9, 38].

Therefore, in this work, we sought to create a space where students marginalized in computing could develop and share their visions for help-seeking structures, in community. We asked, *what are students from marginalized communities in computing visions of help-seeking structures in post-secondary computing courses*? In asking this question, we hoped to not only deepen our understanding of the challenges they face in help-seeking, but also uncover what new structures might best support their learning at the margins, as well as all of their less marginalized peers.

To answer this question, we conducted a futures workshop with 18 students marginalized in computing, including those who are from low-income, first generation, or underrepresented racial groups. We collaborated with students leaders from *AVELA - A Vision for Engineering Literacy & Access* (AVELA), a student-led organization dedicated to STEM outreach for Black and Latine students using a near peer mentorship model [18]. Through workshop artifacts, surveys, and group discussions we carefully observed challenges students face in current help-seeking structures, how they envision new structures, and how they want to implement them. We discuss the implications of our findings on help-seeking literature.

2 Related Work

Our work utilizes Black Feminist Thought as a theoretical framework and draws on literature about barriers to help-seeking and interventions to encourage help-seeking behavior in computing.

2.1 Black Feminist Thought

Black Feminist Thought (BFT) [9] provides an intersectional lens to examine how race, gender, class, and ability shape experiences of oppression and resistance. Collins argues that knowledge emerges through collective practices grounded in care and dialogue, that center vulnerability and interdependence over individualism to challenge traditional authority. In this model, individuals and structures are held accountable for prioritizing the needs of the most marginalized. In computing education, BFT has been applied as a critical framework to center the voices and lived experiences of those most often excluded from the field. Rankin and Irish leveraged Black women's intersectional experiences to transform traditional game design into a more inclusive process, finding that Black women valued authentic cultural representation, intersectional characters, and body diversity [37]. Similarly, Ashford-Hanserd used BFT to co-construct Counter-Life Herstories with Black faculty in computing, revealing that their success was shaped not only by academic preparation but by resilience in the face of systemic bias [1]. Together, these works demonstrate BFT's power as a framework for ensuring that computing education research listens to and is accountable to those it most frequently marginalizes. In our work, BFT serves as a theoretical framework for inquiry and a justification for population focus, grounding the decision to center marginalized students in computing experiences', shaping the futures workshop to focus on uplifting their voices and holding the research accountable to the communities it seeks to serve.

2.2 Barriers to Help-Seeking

Prior research in computing education found that help-seeking structures create barriers that discourage students from seeking help. Computing help-seeking structures often de-incentivize community-based work, fostering environments where fear of judgment and imposter syndrome thrive [2, 8, 25]. Students frequently weigh the cost of asking for help against the perceived competence of the help-giver and the social norms of the classroom, leading them to view available resources as more trouble than they are worth [8, 49]. Additionally, goal orientations of learning environments such as performance-based orientations can deter students' use of social help resources because they foster negative affective barriers, such as intimidation and shame [8].

For marginalized students within computing, barriers to help-seeking are further heightened. Research shows that students from these marginalized backgrounds often prefer to rely on themselves and express reluctance to seek help out of a desire not to burden others or discomfort with vulnerability and self-disclosure [7]. When students do attempt to seek help, they frequently encounter fear of judgment, a diminished sense of belonging, and feelings of shame. Many also navigate stereotype threat, carefully managing how they present themselves to avoid confirming negative perceptions. Students who feel out of place are particularly less likely to seek help, engage with peers about course material, or approach

faculty, due to feelings of intimidation and self-doubt [51]. Interactions with faculty can also be counterproductive; Black students, for instance, often leave one-on-one faculty meetings feeling more isolated, with their racial identity compounding that sense of alienation [43]. Moreover, there are structural barriers to help-seeking. For instance students who are from low-income backgrounds may have personal obligations such as a job or family responsibilities that interfere with their ability to seek help [20, 41]. These works describe how students who are marginalized within computing spaces experience unique barriers to help-seeking and how barriers all students face are further exacerbated due to socio-emotional factors, but they do not explain how we can create new help-seeking structures to address these barriers and encourage students to help seek.

This body of work explains why students, especially those marginalized in computing, avoid seeking help, and how the environments around them amplify this avoidance. It does not offer a path forward or insight into how to build new help-seeking structures that account for students' needs and values.

2.3 Efforts to Address Help-Seeking Barriers

To address these barriers, many computing education researchers have explored how to encourage online help-seeking behaviors [6, 13, 14, 33]. Some proposed technical solutions include intelligent tutoring systems and data-driven displays that provide automated hints to students [30, 35, 48]. However, these solutions prioritize efficiency and scalability and therefore often focus on the mechanics of the help-seeking process. They do not consider the underlying preferences and values of the students they aim to support. Moreover, many students did not trust these resources over a TA or instructor [35].

Generative AI has emerged as a potential help-seeking resource for computing students, offering personalized support. Researchers reported it can offer a non-judgmental avenue for help [50]. Other researchers expanded on this work and found students enjoyed using generative AI because they could ask the model as many questions and did not feel that they were overburdening it [34]. Additionally, for non-native english speakers, generative AI can be used to provide tailored support to students in their native language [32]. However, an over-reliance on generative AI can have far-reaching effects, such as a lack of experience in building relationships and offering emotional support to peers [15]. Moreover, the use of generative AI exacerbates the negative triggers surrounding help-seeking, heightening the emotional barrier students must overcome, and leaving them experiencing shame when seeking help [16]. It is therefore imperative that we cultivate supportive communities within help-seeking structures in computing education.

Some scholars have investigated what factors students valued while using help-seeking resources. Some researchers found marginalized students in computing have a preference for anonymous online help-seeking resources [44]. Ko et al. identified several factors that influence how students seek help within a help-seeking structure. They found that students prioritize the timeliness, availability, and adaptability of help-seeking resources over their formality or socialness [26]. Researchers investigated how students get "unstuck" in computing courses and found many students utilized social strategies to seek help [31]. Other researchers found instructors personality, the availability of the resources, and the preference for working with a help-giver were influential factors that encourage help-seeking [8, 11].

3 Methods

Current literature documents individual student strategies to encourage help-seeking, but a distinct gap remains in creating frameworks to design help-seeking structures that address barriers. We chose to amplify the voices of students marginalized within computing through a futures workshop, because these students are uniquely positioned to ideate on strategies that address both universal help-seeking barriers and those unique to marginalized identities within the field. Futures workshops facilitate ideation through collective discourse, surfacing ideas that only emerge through social negotiation and collaboration. We conducted a five-hour intensive futures workshop with 18 marginalized students in computing at a large public research university.

3.1 Participants & Context

We recruited participants using both targeted outreach and snowball sampling. We primarily recruited participants through AVELA and asked AVELA leaders if they could recommend students to participate in the workshop. The first co-author attended the organization's meetings and invited students to participate in this study. We recruited additional participants via digital flyers distributed to the National Society of Black Engineers (NSBE), the Society of Hispanic Professional Engineers (SHPE), and an alumni email list for Allen Scholars, a program at the University of Washington that supports students from first-generation, low-income, and underserved communities who are pursuing computing majors. By recruiting through these organizations, we engaged a cohort of students who experience marginalization within computing across several intersecting dimensions, including race, socio-economic status, and first generation status. Due to our recruitment strategy, most participants knew one another in the workshop.

Our inclusion criteria required participants to be marginalized students within computing and have engaged in help-seeking within a computing course. Students' help-seeking experiences were typically in large computing courses with more than 100 students. Additionally, we prioritized students who had experience as a TA or instructor in computing courses. We posited that students who had both sought and provided help would offer nuanced insights for what help-seeking structures can look like. To sign up for the workshop students filled out a google form with demographic and free response questions. A total of 37 students filled out the form and 32 met our inclusion criteria.

Table 1 includes self-reported free-response participant demographic information. All participants received a $125 gift card as compensation for their time.

The workshop was held in a large, familiar classroom on the university's campus. The first and third authors facilitated the session. To mitigate the power hierarchy between the facilitators and participants, the facilitators positioned themselves as co-collaborators and framed the participants as the true domain experts. The five-hour

Group	ID	Race/Ethnicity	Gender	Organization Affiliation
Group 1	1A	Black or African American	Female	AVELA, NSBE
	1B	Black or African American	Male	AVELA
	1C	Asian/Pacific Islander	Female	Allen Scholars
	1D	Black or African American	Male	AVELA
Group 2	2A	Black or African American	Female	AVELA
	2B	Black or African American	Woman	AVELA, NSBE
	2C	Black or African American	Female	AVELA
	2D	Black or African American	Male	AVELA, NSBE
Group 3	3A	Hispanic/Latine	Female	Allen Scholars
	3B	Black or African American	Male	AVELA, NSBE
	3C	African	Female	AVELA
	3D	Black or African American	Woman	AVELA, NSBE
	3E	Black or African American	Male	Allen Scholars
Group 4	4A	Black or African American	Female	AVELA
	4B	Hispanic/Latine	Female	SHPE, Allen Scholars
	4C	Black or African American, White	Non-binary/ genderqueer	AVELA, NSBE
	4D	Asian/Pacific Islander	Male	Allen Scholars
	4E	Hispanic/Latine, Native American	Male	SHPE, Allen Scholars

Table 1: Workshop Participant Demographics by Grouping

intensive was split into three distinct phases to manage cognitive load. This included a 40-minute lunch and snack breaks to foster a social atmosphere that was conducive to honest and open collaboration.

3.2 Positionality & Reflexivity

The research team consisted of five women of color with varied, yet intersecting, experiences in computing. Two were graduate students, two were undergraduate students, and one was a senior researcher in the field. All members of the team have occupied "dual roles" within the computing help-seeking landscape. Specifically, we have navigated personal struggles with help-seeking in undergraduate coursework and served as TAs or instructors for computing courses. This shared lived experience provided a foundational understanding of the systemic challenges discussed during the futures workshop and allowed us to establish a "near-peer" rapport with the participants.

To leverage these perspectives while maintaining analytical rigor, we utilized several reflexive strategies. Three members of the research team were present at the futures workshop to capture notes on student behavior. The fourth author served as a direct participant in the workshop; her unique insight as both a researcher and a participant helped guide the analysis and allowed us to accurately capture the intent and emotional nuances of the cohort's visions. While the existing relationships between the first co-author, the fourth author, and the students facilitated a high level of trust and vulnerability during the workshop, we accounted for potential biases through iterative rounds of cross-checking and collaborative coding. Throughout the analysis, the team constantly reflected on how our negative help-seeking experiences and advocacy for increased participation in computing might influence our interpretation of the data. We used consensus memos and expert audits to ensure that our findings remained grounded in the participants' voices.

Throughout, the last author acted as an advisor and guide for this work, drawing upon her many experiences as a marginalized help seeker and as an educator who tries to support marginalized help seekers through culturally responsive and liberatory pedagogies.

3.3 Workshop Structure

3.3.1 Futuring. The Futures Workshop, developed by Robert Jungk, is a democratic technique that empowers those most affected by systemic issues to influence future decision-making [19]. By reversing traditional power structures, this method centers students as the primary designers of help-seeking structures. Moreover, futures workshops serve as a social learning tool for participants, because they allow participants to engage in discussion and ideation that expands their knowledge of the issue [29]. There are many methods for ideation, including visual collages or scenario building [42, 46]. Speculative futures allows for deeper ideation on potential futures for communities on the margins, creating visions that account for specific cultures and needs of underrepresented populations [42]. By embracing radical futurity and the assumption that the future does not yet exist, researchers can create a playful, exploratory space where students can ideate while unburdened by current institutional constraints [12].

Research into "Sister Circles" [36] and "STEM Sista Spaces" [1] demonstrates that participants feel safer and are more willing to share struggles without fear of rejection in spaces composed of people with shared identities. For example, research shows that when Black female students work with facilitators who are also women of color, the shared lived experiences creates a protective environment [1]. This sense of familiarity allows students to reveal academic fears and struggles without the risk of being misunderstood or judged. These works informed our decision to conduct a student-only workshop. By excluding faculty and administrators from the ideation phase, we gave students design control without institutional limitations and created a safe space for students.

This shift in power redistributes agency to intersectional populations and allows students to collaborate on ideas for the future of computing education [36].

3.3.2 Workshop Design & Development. The first and second authors developed the workshop's structure and activities over a two-month period. Then, we conducted a pilot workshop with 4 students and changed activities based on participant feedback. Then, we engaged in a six-week iterative refinement process in collaboration with leaders from AVELA. These student leaders served as consultants on the workshop's logistical and pedagogical framework.

These meetings served three functions. First, the board members provided recruitment and logistical guidance; they identified optimal dates and locations to accommodate participants and pinpointed specific student organizations for recruitment. Second, the board helped facilitate institutional buy-in by identifying specific faculty and staff members whose statements of support would carry the most weight with the student body. Finally, the board members reviewed the workshop design, identifying areas of conceptual ambiguity and gaps in logic that needed refinement to ensure all activities were accessible to participants. This collaborative design process crystallized the workshop into three phases: *Critique*, *Fantasy*, and *Implementation*.

3.3.3 Workshop Preparation and Rapport Building (45 minutes). We pre-assigned participants to four groups of 4-5 students to ensure that there were students from a variety of backgrounds in each group (Table 1). To create these groups we asked AVELA to help us group students who could work well together. We began the workshop with an explanation of why this workshop was being conducted and emphasized that the students were considered to be experts in help-seeking. To ground the importance of this work, we explained that students' ideas would be disseminated to university leadership and showed them a video that contained statements of support from faculty/staff members at the university where the research was being conducted. We conducted an icebreaker activity to foster out-of-the-box thinking and mutual comfort. This was necessary because the workshop required participants to be vulnerable about their negative academic experiences. After the conclusion of the icebreaker, we asked all participants to collaboratively establish community guidelines to create a safe environment for disagreement and vulnerability.

3.3.4 Critique. The goal of the *Critique* phase was to establish a collective understanding of the systemic challenges students face when seeking help in computing courses. Participants identified existing help-seeking resources, such as office hours, online forums, or their peers, and the emotions associated with each resource. Participants completed a reflection form on the specific challenges they faced, then engaged in small-group discussions focused on how these challenges influenced their learning behaviors. Then, the groups consolidated the result of their discussions onto posters, identifying the 3 largest challenges they faced. The groups looked at each others' posters and used color-coded sticky notes to identify similarities and differences between their challenges and pose questions to one another. After reviewing the feedback from other groups, each group shared its top three challenges with the full cohort. These challenges served as our collective challenges that we refer to throughout the workshop.

3.3.5 Fantasy. In the *Fantasy* phase, students were encouraged to think beyond current norms and ideate "ideal" help-seeking structures without considering institutional limitations. Participants first created *Personal Community Maps* (PCMs), a visual diagram that described a community in which they already felt comfortable showing vulnerability. They mapped these communities across dimensions of People, Emotions, Locations, Values, and Communication/Collaboration. We used these dimensions because they directly influence how students navigate help-seeking structures in current literature. This activity was meant to help students think about attributes in existing communities that made them feel comfortable and safe, so they could draw on these ideas when crafting their ideal help-seeking structures. Each student shared their PCM with their group. Using these existing communities as a blueprint, each group designed a new "ideal" help-seeking structure meant to capture students' specific needs and values.

They constructed these new communities in *Group Help-Seeking Maps* (GHSM), a visual diagram which contained the 5 dimensions from the PCMs and an additional dimension of Resources. Each group collectively decided on the attributes they wanted present in each dimension. Students applied their GHSM to four scenarios that dealt with different help-seeking challenges, and to the challenges they identified during the *Critique* phase to determine how their envisioned help-seeking structure would provide support in real-world situations.

Next, the groups exchanged GHSMs with one another and again used color-coded sticky notes to identify what they did and did not like about the GHSMs and ask questions about them. The act of swapping maps not only fostered dialogue between groups, but also allowed students to expand their own perspectives by understanding the experiences that led to specific aspects of each GHSM. Lastly, each group reviewed the comments left by other groups and evaluated whether they wanted to change any part of their GHSM based on the feedback they received.

3.3.6 Implementation. The final phase focused on prioritizing ideas and translating speculative visions into actionable demands for stakeholders. Each group presented their GHSM to the rest of the participants. Through a whole-group negotiation, the participants combined all four GHSMs into a single Collective Help-Seeking Map. We discussed one dimension at a time. Each group presented the attributes they had in that specific dimension, and then the entire group was welcome to ask questions about or disagree with the attributes presented. This procedure fostered a discussion that would allow us to create a Collective Help-Seeking Map that best represents the ideas of the collective.

To end the workshop, each participant wrote a letter to faculty and administrators at our university. In these letters, students described the current struggles they face seeking help in computing courses, explained their new vision for help-seeking, and discussed how students and leaders should be positioned within that new help-seeking structure.

3.4 Data Collection

We created a multi-modal data corpus that captures both the collective social process and the individual reflections of the participants. Our data sources include audio recordings, survey data, physical artifacts, field notes, and digitally written letters.

We equipped each of the four participant groups with two audio recorders to ensure that we could clearly capture small-group interactions and speculative negotiations. There were 4.5 hours of audio recordings for each group. We took detailed notes of these recordings, creating specific summaries of group conversations and pulling notable quotes from their conversations. We also administered surveys throughout the workshop. Moreover, one author took field notes on students' behavior during the workshop. Lastly, we collected the concept maps students created during the workshop and the letters students wrote at the end of the workshop.

3.5 Data Analysis

We conducted a multi-phase qualitative thematic analysis to translate the workshop's expansive data corpus into a cohesive framework. The analysis followed the structure of the workshop, moving from *Critique* to *Fantasy* to *Implementation*. The analysis team (the first four authors) worked in pairs to ensure consistency and peer debriefing throughout each step of the analysis.

3.5.1 Identifying Challenges. The first stage of analysis focused on the *Critique* phase. This allowed us to identify the barriers students faced during help-seeking. Working in pairs, we analyzed individual surveys and collective challenges with help-seeking. We then iteratively created codes for different types of challenges. The first authors reviewed codes and identified 8 codes for the challenges. These codes were used to identify how students addressed challenges in their help-seeking structures.

3.5.2 Inductive Coding of Fantasy Phase. The second phase aimed to understand the attributes from the PCMs, GHSMs that students would like to see in future help-seeking structures. We analyzed the PCMs and GHSMs using inductive open coding. Each pair of researchers were assigned two groups. For each section of the maps (i.e., Emotions, Values, People, Location, Communication/Collaboration, Resources), the researchers inductively coded the data students put in their PCMs and GHSMs for the respective section. We compared these codes with group survey responses to identify how students envisioned these attributes addressing the help-seeking scenarios and challenges presented. The researchers then reviewed each other's codes, providing feedback and discussing any disagreements they had on how the data had been coded. The first authors looked at all the codes that had been created for each section and consolidated overlapping codes into a codebook that was presented to the research team and refined as a group.

3.5.3 Deductive Coding of Implementation Phase. Using the codebook generated from the *Fantasy* Phase, we deductively coded the collective help-seeking map made by the participants to understand how the collective help-seeking map differed from the groups help-seeking maps and to understand how each section of the map worked together. We also read through the student letters and identified three forms of significant statements: descriptions of why their visions of help-seeking are important, the role the students saw for themselves in their ideated help-seeking structure, and the role leaders should play in their ideated help-seeking structure.

3.5.4 Deriving Themes. Following the individual coding phases, the full research team met to collapse overlapping codes and resolve disagreements through consensus memos. These disagreements primarily arose during the final synthesis of the five themes, specifically regarding which theme most accurately represented specific student data. Some disagreements arose from how we described each theme, so the analysis team reviewed the data to find clearer language. Other disagreements arose from how participants envisioned TAs in help-seeking structures. To resolve this disagreement we reviewed workshop artifacts and the recorded group discussions, to triangulate the participants' true intent.

To ensure the validity and rigor of our findings, these initial claims were brought to a senior expert (the last author who has extensive experience with CS education research and is well-versed in the literature), who challenged our claims to ensure they were theoretically sound and accurately represented the data. This expert-led refinement helped the team identify five overarching themes that encapsulate the relationship between the challenges students face and the multi-layered solutions they envisioned.

4 Results

We found five themes that explain how post-secondary students from marginalized identities in computing envision help-seeking structures. In the following sections, we first provide an overview of each theme before describing the challenges the students wanted to address and the solutions students proposed.

4.1 Help-seeking structures should be responsive to students' lives

Existing help-seeking policies and resources do not consider the lived experiences of students marginalized within computing, and are not able to account for their needs. This is likely due to the fact that these policies and resources are created without student input and have only minimally changed based on challenges that students face. This disconnect between students and the resources they need causes students to not want to utilize existing resources. Marginalized students want help-seeking structures that are responsive to their individual needs and overall recognize that each need may require a unique solution.

4.1.1 Challenge. During the *Critique* phase, participants discussed several structural barriers to help-seeking. For example, participants explained that they prefer social help-seeking and therefore believe that the best way for them to help-seek in their computing courses is through office hours. However, the fact that they are commuters or have jobs prevents them from attending in-person office hours. Participant 1C highlighted the stress caused by office hours' lack of flexibility:

> "The struggle I face when help seeking is the various accommodations to multiple situations... Also for commuter its difficult to get that OH resources in person!"

Participants who are able to attend office hours mentioned that the low TA to student ratio created long wait times to receive help. For example, one participant discussed an experience where a TA was only able to help them for 5 minutes at a time. Moreover, participants discussed a mismatch in expectations between how they want to receive help and the help TAs are able to give them. Multiple participants described how sometimes when they needed help getting "unstuck" on assignments, TAs will say they are unable to provide the requested support due to a "no answer policy" or redirect them to get help from the instructor.

Participant 4C explained that they felt the help they received did not address their learning needs and was treated differently because of their identity:

> "At the community college level there wasn't a lot of available support. I've also experienced help that tells me what to fix without explaining why I get frustrated with the idea that I didn't gain any new info. I've also had classmates that were overly dismissive of my abilities due to race or gender."

4.1.2 Ideation. To address these structural barriers, participants ideated a help-seeking structure grounded in trust, adaptability, and proactive care. Participants envisioned a collaborative culture where instructors and TAs are invested in a student's success.

Participants expressed a desire for instructors and TAs who recognize when a specific explanation is not resonating with students and are willing to pivot. As one participant in Group 4 noted:

> "Yeah, I think TAs or instructors ... maybe the way they explained it didn't work, so they have to try a different way, just being able to adapt to students' needs. Yeah, adaptable instructors and TAs."

This adaptability required a level of "quality control" that participants also called for. Specifically, they believed that additional TA training is needed to ensure that course staff are equipped with not only technical knowledge, but also the communication skills necessary to navigate a student's personal and academic needs.

Furthermore, participants pushed for a shift from a reactive help-seeking culture to a proactive help-seeking culture. They envisioned a structure where "checking in" becomes a norm to prevent students from "spiraling" during personal crises or performance drops. One participant highlighted how this proactive care can help students dealing with personal emergencies from falling behind:

> "My TA reached out when I was missing assignments because I was sick. ... I know TAs can't do everything and can't realistically be on top of every single person in those big intro classes, but like having someone who's there, checking in and not letting someone else spiral."

Ultimately, participants viewed the creation of this new culture as a shared responsibility. They wanted to work with instructors, advisors, and other TAs to create a new help-seeking structure. As Participant 3C summarized, this community allows for a level of transparency and vulnerability that current structures do not achieve:

> "This space allows us to be transparent about our struggles in fast-paced computing courses and to learn collaboratively."

4.2 Help-seeking structures should be psychologically safe spaces

Participants overwhelmingly expressed a need for help-seeking environments to be psychologically safe spaces. They described current help-seeking structures as sites of high emotional risk, where asking for help risks social judgment and the exposure of intellectual limitations.

4.2.1 Challenges. Participants discussed a primary barrier to psychological safety is the fear of judgment from peers or instructors. They described feeling that they had to reach a certain level of content understanding on their own *before* they could ask for help. They felt vulnerable expressing that they needed help.

One participant described feeling judged by peers for not understanding the material.

> "I am scared to ask for help because I think they will think I am not smart enough even though I am. Being in a class full of students who actively show that they understand the class content and being a little judgy when you don't know."

In addition, participants described experiencing heavy imposter syndrome. The consequent lack of belonging made it harder for them to ask for help. One participant stated that:

> "I have terrible imposter syndrome and I feel less than and unintelligent. I don't feel I'm confident."

Feelings of imposter syndrome are exacerbated by the sense of isolation that participants expressed previously. Despite seeing other students seeking help in office hours, they felt lonely in the help-seeking process. Another participant explained this collective isolation as: *"Feeling like I am the only one that is lost or confused."*

Beyond internal doubt, participants identified a more visceral sense of environmental threat. In the final group discussion in the *Implementation* phase, Group 4 explicitly labeled current help-seeking environments as "threatening," noting that this atmosphere acts as a total deterrent for some students:

> "Someone asked, 'Do you ever feel threatened?' and the basic answer is yes. This is why some students don't go and ask for help ... because they feel threatened."

4.2.2 Ideation. To counteract the "threatening" nature of current help-seeking environments, participants envisioned a culture that created safety through authentic relationships and communal support. They expressed that they wanted to *"Bring more down to earth and chill TAs and instructors"* and *"[create] a safe space for Black intelligence and creativity".*

A central component of this vision is shifting help-seeking resources toward informal settings, which participants argued would lower the stakes of vulnerability and mitigate the fears associated with formal academic spaces. One participant explained the logic behind this shift:

> "Basically, to expand on that whole idea, we want to make it more informal because I feel like it lessens the pressure on people in general. A formal setting causes people to freeze up; they don't want to ask a question that may sound 'stupid' to them, which just demotivates them."

Participants also sought a fundamental change in the interpersonal dynamics between themselves and course staff. They advocated for an environment where instructors led with empathy and curiosity, particularly when a student is struggling. Group 4 discussed how they would like to see professors interact with students:

> "Maybe ask them why they're experiencing these drops in performance. Figure out what the problem is rather than telling them they're a bad student."

Additionally, participants highlighted the vulnerability that comes with asking for help. As Participant 4B summarized, they expressed that they wanted:

> "A space where they don't need to fear the TAs and in which they won't feel intimidated or threatened."

To combat the sense of isolation and imposter syndrome, participants created a "collective community" that normalizes shared struggle. This vision moves help-seeking from an individual burden to a communal practice of knowledge-building. Participant 2D reflected on how this shift would reduce their feelings of isolation:

> "This new collective community helps us meet in the middle. It reassures me that it's okay to ask questions, to lean on each other, and to build knowledge together, rather than in isolation."

Ultimately, participants viewed this safety as something that must be intentionally co-constructed with leadership. They called for a culture that supports students, providing them with a space where they feel safe to grow both intellectually and socially. In their letters, participants summarized the value of this envisioned community:

> "This community matters to me because, for the first time, I can see a space where everyone supports each other, not just academically, but also emotionally and socially." - Participant 2D

> "I hope leaders can help us create this safe space by building a community where students and TAs build a relationship that can later support them in their learning." - Participant 1A

4.3 Help-seeking structures should encourage student agency and autonomy to design their learning spaces

Current computing help-seeking structures are often characterized by a rigidity that fails to accommodate the diverse learning preferences of students. Participants noted that existing policies frequently dictate a "correct" way to seek help — usually through formal, instructor-led channels — which left little room for student-centered learning spaces. Participants expressed a desire for structures that not only offer various modalities of support but also affirm their agency in choosing how they navigate their own learning process.

4.3.1 Challenges. A primary challenge identified by participants is a lack of autonomy and agency in current help-seeking structures. They expressed a desire to be independent and complete work without relying on TAs or instructor. However, they found few resources that supported this desire for self-reliance. Participants discussed how they found some existing help-seeking resources to be unhelpful. For instance, they mentioned how even though TAs are a primary source of help, they are not always able to help students in the way they need. One participant in Group 2 highlighted how the mismatch between their specific preferences around receiving help and the rigid teaching structures of TAs can lead to a total disengagement from the resource:

> "I'm very particular about the way I learn, and I'm picky about my teachers and TAs, so if they don't have the teaching structure that I'm looking for, it doesn't help me at all, and I'd rather not go to them for help."

Furthermore, when students do choose to engage with formal systems like office hours, they often encounter logistical and pedagogical friction. Participants reported feeling that their questions were out of scope of the course or that the help they were provided was merely a quick fix rather than a meaningful explanation. As Participant 4B noted, this can turn the act of help-seeking into a source of dread:

> "Dread, humiliation, not understanding a simple process or understanding when a TA explains it in a convoluted way, taking up another student's time (when OH is full and TA's say they have other people to help)."

4.3.2 Ideation. To address these rigidities, participants envisioned a multi-modal help-seeking structure that prioritizes student agency and recognizes that "to learn is to struggle." A central component of this vision is providing a variety of learning resources and environments so students can choose the one that best aligns with their learning preferences. Rather than being forced into a single channel, participants advocated for various pathways to seek help, ranging from "chill," informal social spaces to independent, technology-mediated resources.

Participants specifically called for flexibility in the modality of the resources, recognizing that what provides safety for one student may create a barrier for another. For some, the comfort of asking questions from a private virtual space, like Discord, or anonymously through EdStem, allows them to by-pass the sensory and social overwhelm of in-person office hours. For others, the ability to find "buddies" in a physical student lounge is most appealing.

Participants from two different groups explicitly mapped out the help-seeking process for when a student faces a challenge within their ideated help-seeking communities.

Group 2 discussed a scenario where a student encounters a bug for multiple hours:

> "They can also consult with their friends to see if they also have the same bug. If they exhaust these options,

> including using AI/Youtube resources they should confide in special tutoring with staff."

Group 4 discussed a scenario where a student does not have anyone to work with on a group project:

> "First, reach out to your buddy! Then, look at our resources of online talking forums and community based majors/areas that can help you find people in similar classes."

Both groups advocated for social help-seeking as a first step, but also acknowledged that this may not work for everyone. They therefore provided alternatives including both independent and social online resources. Participants also wanted to use generative AI as a tool to supplement their understanding. By providing multiple routes to help-seek, with varied modalities and levels of formality, participants' ideas affirmed that there is no "correct" way to struggle.

Furthermore, participants envisioned these communities as spaces for mutual accountability. They recognized that flexibility requires a supportive structure to prevent procrastination and ensure students utilize resources in a timely manner. Group 1 noted the need for this community-led enforcement:

> "There is need to remind them if they procrastinate there won't be much time to ask for help."

Participants emphasized that a flexible system must accommodate and *affirm* students' diverse learning preferences. They called for a culture where instructors respect that beginners may take longer to process concepts and utilize different pathways to seek help. Participant 4E summarized the need for institutional empathy in their letter:

> "I hope that those that read this change their ways of teaching to be more welcoming of beginners ... we can't be expected to understand all the concepts handed to us, it make take others longer to understand since we all go on our own pace."

4.4 Help-seeking structures should provide a space for students to learn from failure without facing consequences

Participants expressed a desire for "consequence-free" learning, where they can "fail" and iterate without potentially negatively impacting their grades. They noted that there are currently very few opportunities for low-stakes practice, meaning learning opportunities are often assessments.

4.4.1 Challenge. A common challenge students faced was perceiving a resource to be unhelpful because of a misalignment between said resource and course assessments. For example, a participant discussed how the assignments they were given to help them study for exams were not related to the exam content. Participant 2A discussed:

> "I have also noticed that in some quiz sections we often go over the same high level content from lecture. The examples are usually simple and do not prepare us for the deeper and more detailed problems we see on quizzes or exams."

Moreover, participants discussed technical language being difficult to understand and be assessed on:

> "Technical jargon that seems straightforward to experienced students can be completely unfamiliar to newcomers."

This stressed the need to provide more low-stakes opportunities for students to practice their skills and give them time to grasp concepts.

Additionally, participants discussed how help-seeking resources were constrained by restrictive policies regarding TAs. For example, participants reported that TAs often struggled to offer guidance due to their fear of giving away the answer. This left the students unable to make progress on their work and deprived them of a space to productively struggle with course concepts. As Participant 2A said:

> "The TA's would not explain concepts that had already been taught in class, assuming that I understood it from lecture. They often say that they do not want to tell me how to solve the problem, but they also do not explain it or guide me on the right path to solving it."

4.4.2 Ideation. To address this challenge, participants stated that they wanted to be able to have study sessions and practice quizzes where they are able to assess their knowledge in a similar testing environment without lowering their grades if they performed poorly.

Participants proposed frequent, ungraded assessments that could help serve as a diagnostic tool to inform students' of gaps in their knowledge. Group 2 suggested that instructors provide:

> "Quizzes that test knowledge that are not graded; used as a benchmark so students can understand what they do and do not know"

> "The teaching team puts out occasional exams and tests, that tests students' knowledge, without penalty to their grades, to make sure students understand." - Participant 2B

Participants advocated for these consequence-free opportunities to help them engage in self-learning, as these opportunities can act as a tool for them to stay on track in the course. Group 2 said:

> "The practice quizzes and assignments being posted would help a ton. Self learning when someone needs to catch up is also beneficial."

A participant explained that when instructors provide different assessment options, students can have equal opportunity to practice their understanding of a topic. They argued that this approach would ensure that students are not penalized for the time it takes for them to achieve mastery in a subject, accounting for different starting points in knowledge. In their letter to the administration, Participant 3C stated that instructors should:

> "Explore ways to account for varying levels of prior experience when evaluating student performance, ensuring that students starting from scratch receive equitable recognition for their growth."

4.5 Help-seeking structures should facilitate interactions between people with shared identities and cultures to create support and joy

Participants discussed how they wanted help-seeking to be a collaborative process with other students and course staff. Students believe that collaboration among peers and instructional team during help-seeking can foster joy and mutual support. Participants expressed a strong desire to see their own identities reflected in the help-seeking process, emphasizing the benefits of interacting with others that held shared identities and backgrounds.

4.5.1 Challenges. One significant challenge participants discussed was feeling isolated while seeking help. They felt lonely in help-seeking and did not feel that there was any sense of community within current help-seeking structures. Instead of feeling negative emotions surrounding help-seeking, they wanted to feel more joy and support. This sense of isolation is compounded when students do not see their own backgrounds or identities reflected in the help-seeking landscape:

> "When you don't see other students from your background or someone that looks like you struggling as well, you just feel kind of alone."

The absence of a shared identity can also create social tension, where students are excluded from peer collaboration:

> "Yeah I feel like sometimes, especially like being the only one of a certain, like I remember I was the only black girl in my lab, and my partner didn't want to talk to me."

Another significant challenge participants faced was imposter syndrome, where they believed they did not have the necessary knowledge to be in the field and should not be asking others for help because it would expose their knowledge deficit to other students or the course staff. One participant shared her fear of seeking help from instructors:

> "I struggled in asking the right questions, I stressed about going to office hours both 1-1 with the professor and with the TA at [tutoring center] for the professor because it would be only us, and asking the wrong question felt bigger."

4.5.2 Ideation. To address their feelings of isolation, participants envisioned a help-seeking structure grounded in cultural familiarity and communal experiences. Participants highlighted that help-seeking is most effective when it occurs within a community of peers who share similar backgrounds, values, and life experiences. Participants explained they wanted opportunities to make more friends within their major. Participants argued that finding common ground with others doesn't just provide academic help, but the emotional safety necessary to be vulnerable. A participant in Group 4 stated:

> "I think sometimes you feel more comfortable with your friends; you're more likely to be more vulnerable about your problems. Just like having an overall connection with the person. I think like some common ground would help people be more open to express their problems, especially with like homework."

Some participants discussed identity-based communities they found in STEM that helped feel more comfortable asking help from others such as NSBE, SHPE, or Color Stack. Another participant explained how finding connection through shared identity can grow the community of help-seeking support students have:

> "I had friends in community college and we would study material together and took the same classes. We would help each other and we would have discussions together on content and stay up late... My very first quarter in the school I made a friend she is Tanzanian and we were the only Africans in the class, so we became friends."

Shared identity can also facilitate deeper understanding of course content. For example, participants discussed how shared life experiences can allow for more effective communication, like peers discussing course content in their native language. This fosters a better understanding of the content than the typical English-only help-seeking resources.

Participants also noted that when peers openly acknowledged their difficulties, it acts as a source of collective empowerment. Group 3 explained *"Knowing other people who were struggling that looked like you could be empowering."*

To implement this vision, participants proposed utilizing student organization models, such as NSBE, CAMP, and ColorStack, as the blueprint for university help-seeking. One participant proposed creating community through, *"introducing something in that realm where there's a matching system when you need assistance."* By formalizing these help-seeking networks, participants wanted to see an environment where notes and resources were shared more openly and no one tried to conceal helpful resources. Participant 1D spoke in their letter about the importance of sharing resources, stating:

> "My role as student to help create this new community is providing students with the information, letting them know that communities such as color stack and AVELA are available. These types of communities give an informal method for students to gain the support they need."

Ultimately, participants argued that the university has a responsibility to help facilitate these connections. Students should not be left to find connections on their own. By advertising and supporting identity-based STEM communities, leaders can help create a space where help-seeking is no longer a burden, but fosters sustained support and shared joy.

5 Discussion

This study explored how students from marginalized identities within computing envision help-seeking structures in computing courses. Through a futures workshop, students worked together to design new help-seeking structures to address challenges they currently face in seeking help. In this process, they drew from the characteristics of existing communities that they feel comfortable in. We found that students envisioned help-seeking structures rooted

in community and care. In these structures, they felt psychologically safe, were supported by people who shared their experiences, and were both empowered to learn on their own terms and free to fail without consequence. These visions offer a new framework for designing help-seeking structures that are responsive to marginalized students' needs. We provide a table of design principles and examples of structures that synthesize our findings:

5.1 Implications for Research

Our findings in 4.1 demonstrate that help-seeking structures must be responsive to students' needs. Computing education's reliance on standardized models of support reflects a broader assumption that computing knowledge is culturally neutral. Our findings align with culturally responsive pedagogy [28] by arguing that support structures need to be responsive to students' cultural backgrounds rather than assuming a one-size-fits-all approach. Above all our findings demonstrate that students have particular visions for what better help-seeking structures look like. Students desire help-seeking structures that embedded in their everyday environments and communities. They wanted less of a distinction between their life and computing by creating help-seeking structures that meet them where they are. Moreover, our finding demonstrate forcing students to adapt to systems they did not create places the burden of institutional failures on those least responsible for them.

Our findings in 4.2 suggest that help-seeking structures in computing courses do not provide students with the safety they need to be vulnerable. Prior work has discussed students' fear of judgment while seeking help [5]; our findings confirm this and further reveal how students perceive and navigate the social norms surrounding help-seeking. Students described how they felt threatened when help-seeking in computing courses. This extends literature about common deficit-oriented explanations that attribute help-seeking avoidance to students' psychological barriers such as low self-efficacy or lack of belonging [3]. Rather, our work indicates that computing culture and norms around help-seeking need to become more empathetic and accepting of imperfection. Additionally, our findings demonstrate imposter syndrome in computing may be better understood as an accurate perception of a hostile environment and by creating spaces where struggle is normalized and shared students can start building community. Moreover, our findings suggest that the barriers marginalized students face in help-seeking in computing do not arise from motivational deficits, but instead structural mismatches between institutional support systems and students' lived realities. Help-seeking literature should therefore move beyond individual-level explanations and consider how culture and institutional power shape whether students feel safe to ask for help.

A critical and underexplored tension in help-seeking support is not simply whether resources exist, but whether students have the freedom to use them on their own terms. Our findings in 4.3 suggest students desire agency and autonomy in how they seek help, yet described encountering significant constraints on their freedom. Many policies and resources instructors utilize actually constrain students by creating "red tape" that limits them from turning to friends or other resources that they find valuable. This reframes the problem: the barrier is not a lack of resources, but a lack of agency. This extends prior literature that highlights how availability and adaptability are key factors in whether students use a resource [26], but pushes further by showing that student autonomy is not just a preference and is a precondition for success. This is consistent with self-determination theory, which holds that motivation to engage decreases when autonomy is removed [10], but our findings give this theory a structural dimension. It is not just individual motivation at stake, but the systems and policies instructors design that either grant or deny that autonomy. When they are denied the autonomy to seek help in ways that feel natural and comfortable to them, it reinforces their sense of isolation and alienation in computing spaces that were not designed for them.

Furthermore, our findings in 4.4 suggest that students need space to fail without facing academic consequences. Students valued the ability to make mistakes and learn from them, yet feel that current help-seeking structures punish failure. This creates a mismatch where students are motivated by mastery, but the systems around them reward performance. Students align well with mastery goal orientation where they can focus on on learning, self-improvement, progress, and mastery of the task [40]. This demonstrates that in this new help-seeking structure students are not looking for quick answers, but care deeply about the content and want explanatory and conceptual help.

We found that community and friendship emerged as central to students' visions of effective help-seeking structures. In 4.5 students described friends as valuable assets in not only their personal lives, but also navigating challenges in help-seeking. Students described that their friends were essential to creating supportive and joyous learning environments. This aligns well with Yosso's *Community Cultural Wealth framework* which argues that students utilize their peers and social contacts to navigate social institutions. Students also expressed a desire to see people who shared their identities while help-seeking, suggesting that representation within help-seeking spaces is important for marginalized students' sense of belonging. Other students discussed how they wanted computing courses to facilitate the creation of friendships and community. This aligns with prior work showing that sense of belonging is a key factor in marginalized students' persistence and engagement in computing [17].

Finally, our work speaks to growing concerns that large language models are eroding social interactions in computing help-seeking [16]. Rather than rejecting AI entirely, students envisioned a division of labor between AI and human connection where AI supports personalized learning and human relationships provide psychological safety, support and joy. Help-seeking structures should therefore not dismiss AI as a tool for help-seeking, but as a tool that frees up space for the kinds of meaningful connections students described.

5.2 Limitations and Future Work

There are many limitations to this study. First, we recruited participants from student organizations at a large R1 public university. We did not reach students who were not involved in these student organizations. Additionally, students had varied experiences in computing courses, which meant that their visions of help-seeking structures were more general and could accommodate a variety of classes which made them less concrete. Moreover, some challenges

Design Principle	Examples from Futures Workshop
Design flexible help-seeking structures that can adapt to students without breaking	Learning in comfortable and familiar spaces; Recognize when a student is struggling and help them
Create conditions where students do not feel judged and if they do find ways to mitigate judgement.	Responsive TA training; Foster a less threatening culture
Instructors should model vulnerability to connect with students	Instructors going to student spaces
Normalize failure and create low-stakes opportunities to practice	Practice exams/quizzes; Students have reliable help beyond TAs
Celebrate and model failure by treating it as an essential aspect of help-seeking	More opportunities for evaluating learning; Instructors sharing personal struggles in computing
Facilitate peer interaction so students can connect with others from shared identities.	Buddy system, peer matching system
Build classroom community to encourage collaboration beyond it.	Group work that encourages students to share about themselves
Create joyful, socially connected help-seeking experiences.	Using memes and social media

Table 2: Design principle for help-seeking structures and students examples from workshop

students mentioned such as only receiving 5 minutes with each TA stems from large classroom sizes and would likely not appear at a institution with smaller classroom sizes. We note that these findings may be most applicable in environments where help-seeking structures are designed for formal learning environments. Some of the barriers the participants described may be less pronounced in courses that are already organized around collaborative learning. Lastly, the length and one-time nature of the workshop may have fatigued students, impacting their engagement in the workshop.

Future work can address these limitations by recruiting participants from multiple post-secondary institutions. This will allow them to develop a better understanding of students from different organizations and backgrounds envision new help-seeking structures. Moreover, they should recruit students from other marginalized backgrounds in computing, including students with disabilities. Lastly, future research should seek to explore how instructors can apply the design principles in Table 2 in a course and understand the impact they have on students' help-seeking behavior.

5.3 Implications for Practice

There are many implications for practice. Table 2 describes design principles with concrete strategies for redesigning help-seeking structures across several dimensions. They envisioned instructors physically coming to informal student spaces to create a smaller power imbalance, peer matching systems that connect students across shared identities, and low-stakes practice opportunities like practice exams and quizzes that normalize failure. Students also emphasized the need for responsive TA training that develops communication skills, cultural responsiveness, and the ability to adapt explanations to different students' needs. These examples suggest that improving help-seeking requires not just better resources, but deliberate changes to the spaces, relationships, and cultures in which help-seeking happens.

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