Scaling Active Group Office Hours: Developing TA Training Guidelines for Equitable and Replicable Student Support in Large Engineering Courses

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Abstract - Active Group Office Hours (AGOH) enhance engagement and success in high-enrollment engineering courses, yet scaling these benefits remains a challenge when transitioning from instructor-led to Teaching Assistant (TA)-led sessions. This mixed-methods study evaluates the scalability of AGOH in large-enrollment environments (N≈300) by comparing student responses across instructor-led and trained undergraduate TA-led sessions. Utilizing Office Hours (OH) Exit Slip Survey and End-of-Term Evaluation Survey, this research analyzes the efficacy of a training and shadowing model for TAs. Data collection focuses on student self-reporting and feedback from the teaching team to identify key active learning elements. The study culminates in empirically informed guiding principles for early-term TA training. This research provides an evidence-based framework for AGOH and offers a scalable structure for TA-led recitations, ensuring that active learning remains a replicable and equitable mechanism for student support across diverse large-class environments.

1. Introduction

Office hours remain one of the most widely used academic support mechanisms in undergraduate STEM classes. However, large-enrollment introductory engineering courses pose persistent challenges to access, consistency, and student comfort with seeking help. In these settings, students often need timely support during complex problem-solving. However, traditional office hours frequently default to transactional, one-to-one troubleshooting between instructor and student, which constrains peer learning and makes productive problem-solving norms less visible [1], [2], [3]. Participation can also be reduced when students perceive office hours as intimidating, socially costly, or misaligned with their needs, particularly in crowded environments [4], [5], [6].

Within an evidence-based instructional practice (EBIP) framing, prior work suggests that participation in office hours and structured collaborative support are associated with improved academic outcomes, while also emphasizing that outcomes depend on implementation quality [7], [8]. While student-centered instruction generally increases motivation, outcomes vary based on facilitation quality. Effective enactment depends on supporting student autonomy, providing timely feedback to build competence, and fostering relatedness through gestures like humor and informal check-ins [7]. These principles have been examined across a range of instructional support context, including office hours.

Observational work in large programming courses has found positive associations between office hours use and course performance, motivating efforts to increase both participation and the quality of interaction [1], [8]. In engineering contexts, redesigns that shift office hours into structured study sessions have reported improved grades for students who participate, suggesting that collaborative, practice-oriented formats can better translate time on task into learning gains than purely transactional help [9]. Parallel evidence from peer-assisted academic support models, such as Supplemental Instruction, further indicates that group-based, facilitation-centered study environments are associated with improved course performance, particularly in challenging introductory courses where students often struggle to develop early understanding of core concepts [10].

Despite advances, prior work leaves open practical questions about how to implement office hours in ways that remain effective and equitable when a large number of students seek help simultaneously. Students frequently report barriers that combine logistical constraints with social and affective costs, including uncertainty about norms, discomfort exposing confusion, and hesitation to ask questions publicly [11]. Related work in engineering education also shows that social interaction and supportive instructional relationships are predictive of belonging in engineering, reinforcing the idea that participation in course support structures may matter for both persistence and performance [12]. More recent studies report that many students view office hours as a last resort. First-year students can interpret help-seeking as a weakness, which suppresses participation early and unevenly across student groups. Large-enrollment conditions compound these issues because fixed times, limited capacity, and crowding can restrict access even when students want to attend. Faculty often underestimate the number and strength of barriers students perceive. While group-based redesigns show promise, they also reveal unresolved scalability questions, since office hours redesigned as structured study session can improve outcomes but depend on sufficient facilitation capacity and consistent enactment under high demand [9]. Institution-level models such as collaborative learning centers demonstrate that higher participation at scale is possible. However, they rely on substantial staffing, space, and coordination that may not transfer directly across courses or institutions [13]. Together, these findings motivate a focus on the broader reach of office hours, as well as benefits to attendees [6].

To address these pedagogical and participation constraints, our team has been developing and evaluating Active Group Office Hours (AGOH) as a structured, facilitation-centered model for large-enrollment engineering courses. In AGOH sessions, students are encouraged to work in small groups on targeted problems, while the teaching team circulates to prompt reasoning, provide feedback, and reinforce productive problem-solving norms [6]. In prior implementations, students reported that the format supported conceptual understanding and homework progress, and many described better peer interaction and increased interest in course skills. Prior findings revealed key constraints regarding scale, including non-attendance driven by schedule conflicts and perceived overcrowding, and student feedback indicating that the experience can degrade when demand outpaces the teaching team's capacity to circulate effectively. These results position AGOH as a promising intervention, while also highlighting a limitation that motivates the present work. Prior evidence was established in instructor-led sessions, and sustainability in large courses requires demonstrating that the model can reach the students who need it and remain effective as staffing and facilitation are distributed across a teaching team [6].

Therefore, this study is guided by the following research questions (RQs):

- RQ1: How effective are AGOH in improving student course success in a large-enrollment engineering course?
- RQ2: To what extent does TA-supported facilitation improve the scalability and effectiveness of AGOH?
- RQ3: What TA training guidelines support equitable and scalable implementation of AGOH for large-group office hours?

2. Methodology

To answer our research questions and develop TA training guidelines, this study used a mixed-methods approach consisting of two online questionnaires, followed by an in-person TA focus group study, with qualitative and quantitative data analyses.

2.1 Active Group Office Hours (AGOH) Implementation

AGOH were offered as a structured support session for a large-enrollment (N≈300) introductory engineering course, EE 215 (Fundamentals of Electrical Engineering), during Autumn Quarter 2025. Unlike the prior year [6] in which AGOH were led by one instructor, this iteration of AGOH was implemented in three formats with different staffing composition. Each session lasted approximately 2 hours and was staffed by the instructor and/or a few undergraduate TAs. Table 1 enumerates each session's start time, location, and staffing composition. Sessions S1 and S3 were offered immediately after the lecture; S2 was offered on a non-lecture day. Across formats, AGOH followed a consistent facilitation approach, with differences in interaction flow.

Table 1. AGOH Environment (Time, Location, Staffing)

S#	Start Time	Location[1]	Staffing
S1	Wednesday (4 – 6 PM)	Atrium (Capacity: 50)	Instructor + 1 Undergraduate TA
S2	Thursday (1 – 3 PM)	Conference room (Capacity: 50)	1 Undergraduate TA
S3	Friday (4 – 6 PM)	Atrium (Capacity: 50)	2 Undergraduate TAs

1: All rooms were equipped with 2-4 whiteboards and sit-around tables to support collaborative problem solving.

2.2 Questionnaire

Two questionnaires administered via Google Forms were used to capture students' perceptions of their learning experiences. Questionnaire responses were anonymous to encourage candid feedback and minimize potential bias. Their responses were used to evaluate the effectiveness and scalability of AGOH, particularly in regard to improving course success. Both questionnaires were adapted from prior implementation [6].

- **End-of-Term Evaluation Survey**: The end-of-term course evaluation assessed teaching effectiveness, office hours utility, and overall student satisfaction. Students also provided their predictions on final exam scores.
- **OH Exit Slip Survey**: Unlike the previous study [6], AGOH offered this year were in three distinct session formats; accordingly, minor revisions were made to the exit slips to document the format attended and to enable format-specific feedback on perceived effectiveness and scalability of AGOH. Students self-reported quiz 1 and 2 performance and predicted final exam scores.

2.2.1 Questionnaire Recruitment and Respondents

Undergraduate students enrolled in EE 215, primarily from Electrical and Computer Engineering (ECE) and Mechanical Engineering (ME), were invited to complete both surveys. Other students were from other engineering or STEM majors (e.g., Industrial Engineering (IE), Computer Engineering (CE), Applied Mathematics, etc.). Data collection was conducted during the last two weeks (Weeks 9 – 11) of Autumn Quarter 2025.

The End-of-Term Evaluation Survey was distributed concurrently with university evaluations as part of a homework assignment to gather perspectives of both AGOH attendees and non-attendees. A total of 295 students participated in the study, yielding a response rate of 94.2% (N = 313). Among participants who were willing to share their majors (n = 292), ME students represented the largest population (n = 134, 45.9%), followed by ECE students (n = 124, 42.5%), IE students (n = 19, 6.5%), and CE students (n = 13, 4.5%). The remaining respondents were from other engineering or STEM majors. Among all respondents, n = 190 (65.1%) were juniors, followed by sophomores (n = 51, 17.5%), seniors (n = 46, 15.8%), and freshmen (n = 5, 1.6%).

The OH Exit Slip Survey was distributed during AGOH sessions. A total of 45 students participated in the study, yielding a response rate of 14.5% (N = 311). ME students again represented the largest population (n = 25, 56.8%), followed by ECE students (n = 14, 31.8%). The remaining respondents were from other engineering or STEM majors. Among all respondents, n = 25 (55.6%) were juniors, followed by seniors (n = 12, 26.6%), sophomores (n = 7, 15.6%), and freshmen (n = 1, 2.2%).

2.2.2 Questionnaire Design

The End-of-Term Evaluation Survey comprised 16 questions, including 14 quantitative items (9 multiple-choice, 2 multi-select, and 3 rating-scale questions) and 2 qualitative open-ended questions. The OH Exit Slip Survey comprised 12 questions, including 10 quantitative items (6 multiple-choice, 2 multi-select, and 2 rating-scale questions) and 2 qualitative open-ended questions.

2.3 Focus Group

This study included a single focus group of 2 undergraduate TAs and 2 graduate TAs with different levels of experience. The focus group was designed for the teaching team to reflect on office hours practices and identify the elements that make AGOH effective. These insights will inform a developing protocol that supports office hours for large engineering classes.

2.3.1 Focus Group Recruitment and Respondents

Participants were recruited from the instructional team (TAs and the course instructor) at University of Washington (Seattle) in Autumn Quarter 2025. TA participants represented a range of academic standings and varied in their prior experience, including whether they had previously served as a TA for this course or an equivalent course, and whether they had taken the course as a student (Table 2).

Table 2. TA participants' academic standing and experience, n = 4

P#	Academic standing	TA experience with this course[1]	Took this course as a student
P1	Undergraduate – Junior	Low	Yes
P2	Undergraduate – Junior	Low	Yes
P3	Graduate – 3rd-year PhD	Medium	No
P4	Graduate – 2nd-year PhD	High	No

1: Low = TA'd this course < 3 times; Medium = 3-8 times; High = > 8 times.

2.3.2 Focus Group Moderation

In December 2025, one faculty member on the research team facilitated the in-person focus group discussion. The goals were to extend the investigation beyond survey data and to gather perspectives from the teaching team about AGOH implementation. Participants were first presented with an initial discussion prompt and invited to share their individual experiences. The moderator then used follow-up questions to probe for clarification and elaboration (e.g., requesting examples or reasoning). After each participant response, the moderator invited other participants to contribute additional perspectives, noting similarities or differences and, when appropriate, discussing areas of agreement to build a shared understanding. This process was repeated across a sequence of prompts. The moderator recorded interview notes through field notes and audio recordings. All personally identifiable information was removed to protect participants' identities.

2.4 Analysis Procedure

Our research team used Python (version 3.13.9), including libraries such as pandas, numpy, and matplotlib, to analyze and visualize questionnaire data through descriptive quantitative analyses of counts, percentages, and response distributions across item types. In addition, ordinal logistic regression (OLR) was used as the inferential analysis to test whether office-hours attendance predicted the likelihood of reporting a higher-than-expected exam-score range.

Open-ended survey responses were analyzed using a grounded-theory-informed qualitative coding process to identify recurring concepts and themes. We applied the same analytic approach to the focus group data. To support transparency and illustrate key themes, we report representative participant quotes in the Results section. Survey participants are referenced as "respondent," and focus group participants are labeled using assigned identifiers (e.g., P1, Table 2) to distinguish data sources while preserving anonymity.

2.5 Limitations

This study has several limitations. First, the OH Exit Slip Survey data may be subject to sampling bias because the survey was completed only by students who attended AGOH and chose to respond. Thus, these responses may not fully represent the experiences of all AGOH attendees, including students who attended but were not aware of the survey or chose not to complete it.

Additionally, some survey items used relatively broad response categories, which may have reduced measurement precision. For instance, the question "As of now, what score do you expect on the final exam (out of 50 points)?" provided wide score ranges rather than a continuous measure. This may have reduced the sensitivity of both correlation-based and probability-based analyses that examine associations between AGOH attendance and expected exam performance. Therefore, non-significant findings from these analyses should be interpreted with caution, as the broad response categories may have limited the ability to identify meaningful associations.

3. Results

To determine the effectiveness of AGOH at scale, we report rate of attendance for instructor- and TA-led AGOH, student perceptions of each AGOH format, and associated student outcomes. First, we discuss findings from the End-of-Term Evaluation Survey, focusing on class-wide

sentiment regarding instructor-led vs. TA-led AGOH formats. Next, we examine the more targeted OH Exit Slip Survey to analyze AGOH attendee perceptions comparing formats. This includes factors that influence AGOH attendance and the perceived benefits of participating in AGOH. Finally, we present findings from both surveys related to exam performance and expected outcomes to contextualize the general class population against the more focused cohort represented in the exit slips by using in-class exam statistics.

3.1 End-of-Term Evaluation Survey

3.1.1 Frequency of Attendance for AGOH

Overall, a majority of students attended at least one AGOH; 55.3% of respondents attended instructor-led AGOH at least once and 63.1% of respondents attended TA-led AGOH at least once. In the End-of-Term Evaluation Survey (n=295), students selected the frequency range that best represented their attendance based on AGOH format (Figure 1).

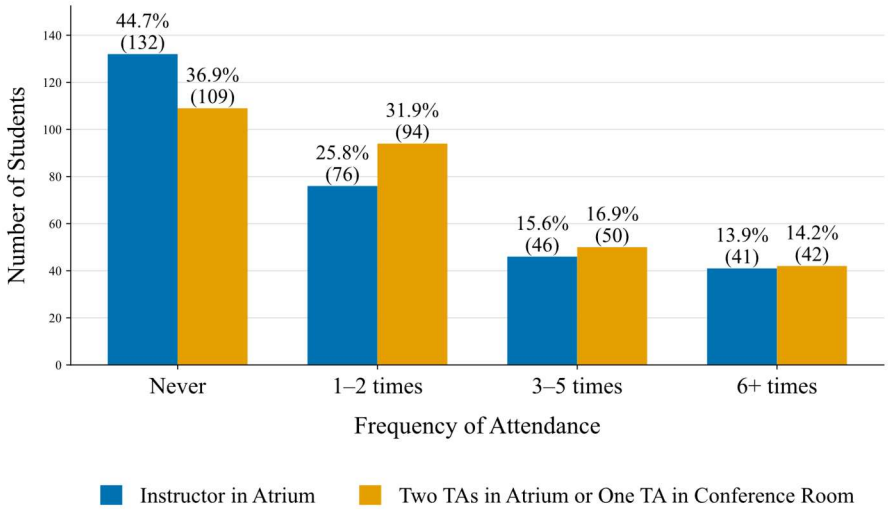

Figure 1. Frequency of student AGOH attendance; End-of-Term Evaluation Survey *(n = 295)*.

Both instructor- and TA-led AGOH were similarly attended. As shown in Figure 1, the combined attendance of the TA-led AGOH either matched or exceeded the attendance of the instructor-led AGOH across all attendance frequencies. The TA-led AGOH saw a greater number of students in search of targeted assistance; 31.9% of respondents reported attending TA-led sessions 1-2 times, compared to 25.8% attending instructor-led sessions 1-2 times. When students returned to AGOH more than twice, the differences between TA-led and instructor-led sessions were less pronounced. The higher targeted assistance rate of the TA-led format suggests that increasing the availability of time slots improves student utilization of the resource, especially for those who required minimal help throughout the quarter. Meanwhile, the comparable return rates between the instructor- and TA-led AGOH suggest that students perceive both formats as similarly effective, signifying the reproducibility of the AGOH model.

3.1.2 Reasons for AGOH Absence

The most common reasons for not attending AGOH were “scheduling conflict” or feeling “no need to attend”. Figure 2 below compares the reported reason for absences between instructor- vs. TA-led AGOH (n=295). Students were asked to choose all factors which prevented their

attendance in a certain AGOH format. A minority of students (9.7% instructor-, 4.5% TA-led) cited a preference for individual office hours as a reason for not attending AGOH. On the other hand, a majority of students cited logistics issues such as "scheduling conflict" and/or "not enough time" were the primary reasons for absence, consistent with previous work [6], [11].

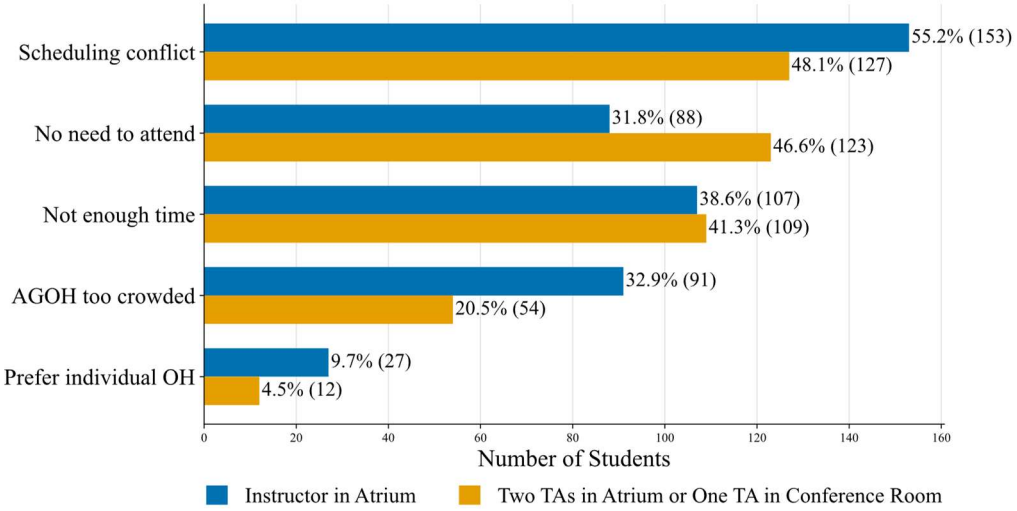

Figure 2. Reported Reasons for Absences; End-of-Term Evaluation Survey (n = 295)

Common reasons for not attending AGOH differed between instructor- and TA-led sessions. Since there were more timeslots for TA-led sessions, "scheduling conflict" was cited less frequently compared to instructor-led AGOH (48.1% TA- vs. 55.2% instructor-led). The "no need to attend" category was cited more frequently in TA-led (46.6%) vs. instructor-led AGOH (31.8%), as some students may feel no need to attend the TA-led sessions which occurred in the days following the instructor's. As such, "AGOH too crowded" was reported more frequently for instructor- compared to TA-led sessions (32.9% instructor- vs. 20.5% TA-led)

To contextualize these findings, we examined representative student comments. Regarding instructor-led AGOH, many students emphasized overcrowding as a barrier to completing work and receiving individualized attention, consistent with Figure 2. One respondent noted, "I wish there had been more time for the professor and the TAs to help individually, as there were many students present (though I still received sufficient help)." While this theme was less prominent in TA-led office hours, it remained the most frequently cited concern in the associated student comments. This suggests that even with three AGOH sessions, students perceived overcrowding as detrimental, reducing both the effectiveness of the sessions and their likelihood of attending when too many students were present or assistance was not provided efficiently.

3.1.3 Quality of AGOH

Students who attended at least one instructor-led (n=166) or TA-led (n=186) AGOH were asked to rate the quality of the AGOH sessions they attended. Roughly two-thirds of the class reported attending at least one OH session for each host type and provided a rating. Table 3 summarizes student ratings of AGOH quality, disaggregated by host type and reported using a categorical scale ranging from *Excellent* to *Very Poor*.

Table 3. Student Ratings of Office Hours Offered by Instructor and Teaching Assitants

Rating	Instructor[1]	Teaching Assistants'[2]
Excellent	40 (24.1%)	75 (40.32%)
Very Good	63 (37.95%)	57 (30.65%)
Good	54 (32.53%)	36 (19.35%)
Fair	8 (4.82%)	16 (8.6%)
Poor	1 (0.6%)	2 (1.08%)
Very Poor	0 (0%)	0 (0%)

1: n=166 with 116 Students never attending the Instructors AGOH.
2: n=186 with 100 Students never attending the Teaching Assistant's AGOH.

As seen in Table 3, the ratings of both instructor- and TA-led AGOH were very similar, with both formats receiving predominantly positive evaluations. Of those who attended, approximately 62% of students rated the instructor-led AGOH as being either "Excellent" or "Very Good", while 71% of respondents rated the TA-led AGOH the same. TA-led AGOH received a higher proportion of "Excellent" ratings (40.32%) compared to the instructor (24.1%), whereas instructor-led AGOH had a larger share of "Good" ratings (32.53%) compared to the TAs (19.35%). Lower ratings ("Fair", "Poor", or "Very Poor") were infrequent for both formats but occurred more often for TA-led AGOH than for instructor-led AGOH (9.7% vs. 5.4%). The similarly ranked responses again suggest that students perceive similar levels of quality between instructor-led and TA-led AGOH, reinforcing the repeatability of the instructor-led AGOH model.

3.2 OH Exit Slip Survey

3.2.1 Frequency of Attendance

During weeks 9 – 11, AGOH attendees were asked to complete the OH Exit Slip Survey. Respondents were instructed to complete the survey only once for the format they attended most frequently (n = 45). The frequency of AGOH attendance for this subset is presented in Figure 3.

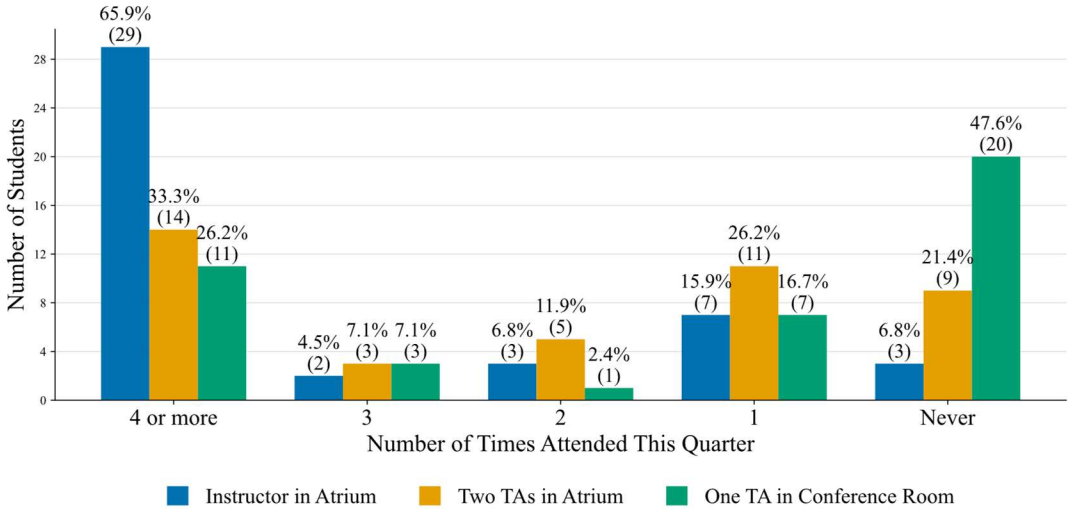

Figure 3. Frequency of Attendance for Different AGOH Formats; OH Exit Slip Survey (n = 45).

A majority of respondents were regular attendees of the instructor-led AGOH, with approximately 65.9% of respondents attending 4 or more times (Figure 3). While the instructor had a greater student retention rate, both TA-led formats either matched or exceeded the rate of students coming 1-3 times. The One TA format was underutilized, with almost half of respondents having never attended.

3.2.2 Reason for Visting

The next OH Exit Slip Survey question asked students to indicate their reason(s) for attending AGOH. These results are presented in Table 4.

Table 4. Reason for Visting Active Group Office Hours (AGOH)

Reason	Number of Students[1]	Pecentage[2]
To get help with homework.	40	88.89%
To work with other students in the course.	29	64.44%
To better understand course material.	26	57.78%
To prepare for the final exam.	12	26.66%

1: n=45 students.
2: Percentage of respondents that agreed with the option

Students attended office hours to receive prompt academic assistance. Students reported attending primarily “to get help with homework” (88.89%). The next most common reason was “to work with other students in the course” at 27.1%, followed closely by attending “to better understand course material” at 24.3%. Preparing for the final exam was selected least often at 11.21%. Overall, responses indicate attendance was driven more by immediate coursework support and collaborative problem solving than by exam preparation.

3.2.3 AGOH Helpfulness

Respondents were asked to rate how helpful the AGOH format was in achieving the intended objectives outlined in Figure 4 (n = 45). These results are aggregated across all AGOH formats. Students were then asked to rate how helpful different features of AGOH were for their learning, on a scale ranging from “Not at all helpful” to “Very helpful” (Figure 5).

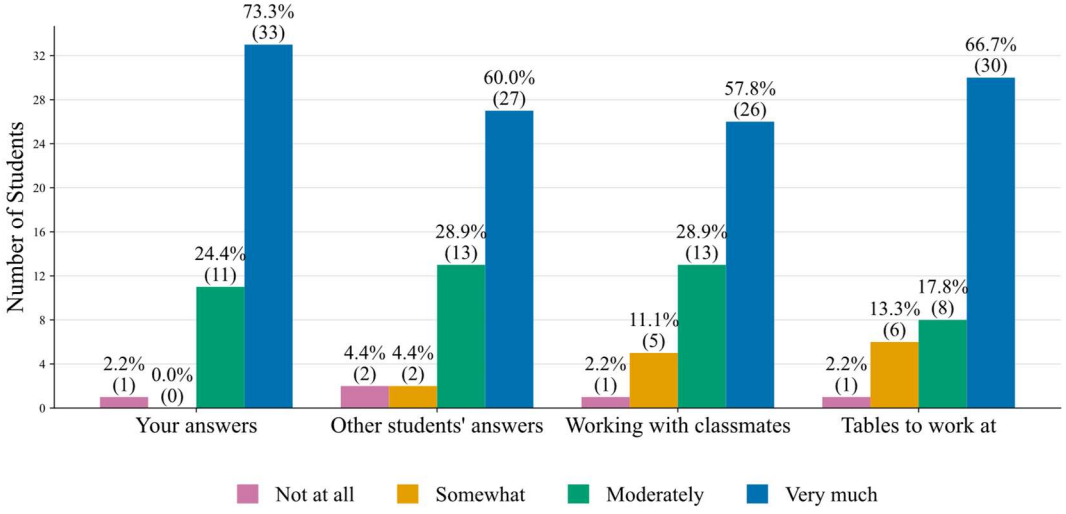

Figure 4. Helpfulness of AGOH for the primary objectives listed. (n=45)

A majority of the students (>66%) found AGOH "Moderately helpful" to "Very helpful" for each of the primary objectives shown in Figure 4. As expected, both "Doing well on homework" and "Understanding course skills/topics" were often the most helpful aspect of AGOH, with the largest share of students citing both groups, and relatively few selecting "Somewhat helpful" or "Not at all helpful". Comparably, "Increasing interest in skills/topics" and "Meeting classmates" had the widest spread, with roughly two-thirds finding that AGOH was "Moderately helpful" to "Very helpful" in these aspects. In general, respondents found AGOH to be beneficial for learning and doing well on the homework.

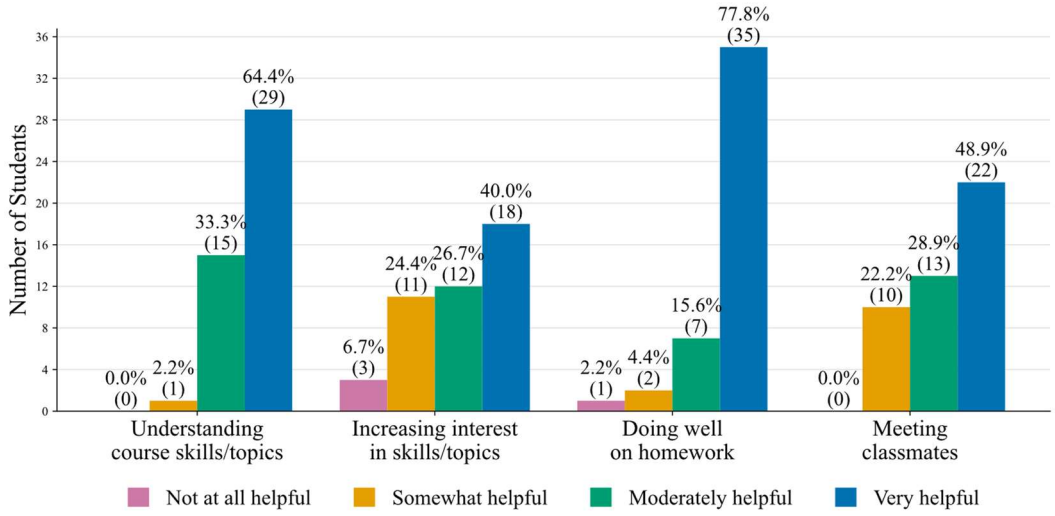

Figure 5. Features of AGOH that contributed to its overall helpfulness. (n=45)

In Figure 5, AGOH organizers' answers to individual questions were cited as one of the most helpful features of AGOH (73.3%); however, a substantial portion of students found the other group-centric features to be similarly helpful. From the availability of tables for collaborative work and the opportunity to listen to other students' questions and responses, to working directly with classmates, approximately 60–75% of students who completed the Exit Slip Survey reported these features as highly valuable. This is supported by several respondents who commented positively on the sense of community and the learning environment, with one noting, "I liked having tables and whiteboards available, and having lots of TAs/the professor available." Another student stated, "I thought it was especially helpful being in a group because if I had a simple question, I could ask the people at my table first and then if we were all confused, we could ask together." As reflected in both the results in Figure 5 and the student responses, the group-based structure of AGOH was effective for the majority of students.

3.3 Expected Outcomes and Performance

Ordinal logistic regression did not show a consistent positive association between office-hours attendance and expected final exam score range. Instructor office-hours attendance was not significantly associated with expected exam-score range across attendance levels. For TA office hours, students who attended 1-2 times had significantly lower odds of reporting a higher expected exam-score range than those who never attended (OR = 0.384, 95% CI [0.215, 0.687], $p = 0.001$). This pattern may reflect higher motivation in help-seeking rather than an adverse effect of office hours. In contrast, the 3-5 times and 6 or more times attendance categories were

not statistically significant. Because expected exam scores were measured using broad score ranges and attendance was self-reported, these results should be interpreted cautiously and not as causal evidence that office-hours attendance lowers expected performance.

4. TA Training Guidelines

The following guidelines were developed through a focus group discussion involving the lead instructor, graduate and undergraduate teaching assistants (TAs), and facilitated by a pedagogical expert from the College of Engineering's Office of Excellence in Teaching and Learning. These guidelines aim to inform teaching teams seeking to replicate and scale active group office hours (AGOHs) in large-enrollment engineering courses, with many of the same features adaptable to the organization of recitation sections. To make these guidelines "easily read and adopted," we have distilled focus group notes into a structured, four-pillar framework.

Each section is designed to be actionable for TAs and instructors, moving from high-level culture to specific "in-the-trenches" facilitation techniques.

4.1 Cultivating the Culture: Encouraging Attendance

Students often view office hours as a "remedial" space rather than a "collaborative" one. The first step is changing that narrative.

- Normalize the Struggle: Use the first lecture to frame homework as "intentionally challenging." This makes seeking help a strategic move rather than a sign of failure.
- Clarify the "Vibe": Use the syllabus to distinguish between:
    - Traditional: One-on-one, task-focused, private.
    - AGOH: Active, group-based, informal, and social.
- Humanize the Team: Share photos of TAs in the space or use "themed" hours (e.g., snacks or holiday themes) to lower the barrier to entry.
- Consistency is Key: Ensure every TA upholds the same tone and expectations discussed in class.

4.2 Designing the Space: The AGOH Environment

The physical environment should be intentionally selected to support peer-to-peer engagement and active learning.

- The Round Table Rule: Use open-floor spaces with round tables to naturally cluster students into collaborative groups.
- Dynamic Grouping: Early in the term, group students by the specific problem they are solving. Later, allow them to drift into social/preferred peer groups.
- Tools for Thinking: While students use personal devices for work, provide dry-erase boards for collaborative brainstorming.
- The "Huddle" Station: If many students struggle with one concept, convene a temporary group at a central station before sending them back to their tables.
- Privacy Buffer: Ensure a private office is nearby for sensitive discussions (e.g., grades or personal issues).

4.3 Strategic Scheduling: Timing and Modality

In large-enrollment courses, accessibility is the primary hurdle to attendance.

- The “Heat Map” Approach:
    - Spread hours across different days and times.
    - Evening slots are often the most popular for student schedules.
    - Peak Load: Increase TA staffing in the 48 hours leading up to major deadlines.
- Multi-Modal Support:
    - Synchronous: Zoom for remote access.
    - Asynchronous: Piazza or Ed Discussion for 24/7 Q&A.
    - Student-Led: Monitor (but don't necessarily police) informal spaces like Discord.
- The In-Person Premium: Remind students that while virtual tools are convenient, the core benefits of AGOH (networking and peer teaching) happen best in person.

4.4 Master Facilitation: The TA’s Role

A TA in an AGOH session is a conductor, not a lecturer.

The “Roving Facilitator” Model: Instead of sitting at a desk waiting for a line to form, TAs should move constantly through the room, from one group to the next.

- The Queue: Write names on a whiteboard along with the problem number.
- The 5-Minute Rule: Use a timer to prevent one student from monopolizing the TA.
- Pay it Forward: If you just taught Student A a concept, ask Student A to explain it to Student B when they arrive with the same question.
- Suggest that students work on problems analogous to the homework problem, either independently or with TA guidance, to reinforce conceptual understanding.
- Refer students to relevant lecture slides, worked examples, or other course materials when appropriate.
- Acknowledge that multiple valid solution methods may exist and vary TA facilitation approaches accordingly, either by supporting the student’s chosen method or encouraging consideration of alternative approaches.

4.5 Overcoming Facilitation Challenges

AGOH can be unpredictable. TAs should be trained to manage the “vibe” and the scope of the room with these strategies:

- The “Deep Dive” Trap: When students ask questions far beyond the course scope, TAs should gently steer them back to learning objectives.
    - *Script:* “That’s a fascinating technical detail, but for this course, we want you to focus on [X]. Let’s nail that first.”
- Supportive Resource Mapping: Avoid sounding dismissive (e.g., “It’s in the book”). Instead, offer to co-read:
    - *Action:* “Let’s open the textbook to page 45 together and see if we can find the clue for this variable.”
- Managing Lab Fatigue: If TAs find themselves repeating the same lab demo, it’s a sign to pause the room.
    - *Strategy:* “I’m seeing a lot of questions on the oscilloscope setup. Everyone, look at the front for two minutes for a quick refresher, then we’ll jump back in.”
- Focus Maintenance: In an “unconstrained” environment, check in on groups that have drifted into social talk to ensure they haven’t hit a “blocker” they’re afraid to ask about.

4.6 Reaching the "Missing" Students

There might be students who face barriers to attendance: some may avoid group settings due to social anxiety, or the fear of appearing behind their peers, while others maybe commuters students or with significant scheduling constraints. Below are some ideas that were discussed in the focus group to reach the missing students.

- The Individual Invitation: A personalized email from a TA to a student, "*I noticed you had a cool approach to the last quiz; I'd love to see you at AGOH to help lead a table"* can flip the script from "getting help" to "contributing."
- The "Quiet" Alternative: Acknowledge that AGOH is loud. Always advertise by-appointment 1-on-1 slots for students who are overstimulated by group settings or need to discuss sensitive academic issues.
- Avoid "Beginner" Labels: Never brand a session as "Remedial" or "For those struggling." Instead, use "Foundational Review" or "Back-to-Basics Workshop."

5. Conclusion and Future Work

This study demonstrates that the Active Group Office Hours model is a high-impact, scalable solution to improve student engagement and course success in large-enrollment engineering courses. Building upon previous "work in progress" findings, our data from End-of-Term Evaluation and OH Exit Slip surveys confirm that students perceive AGOH as highly beneficial to their learning process.

A key finding of this research is the successful parity between instructor-led and TA-led sessions. Student engagement levels and attendance frequencies remained consistent across both formats. Notably, student ratings for TA-led sessions were equal to, and in some cases, slightly higher than, instructor-led sessions. This suggests that the active group office hours format can be replicated through TA training or shadowing such that TAs are equipped with the proper facilitation tools. While instructor-led sessions occasionally struggled with high student density, the TA-led sessions demonstrated greater capacity to distribute attendance, effectively reducing overcrowding concerns. Furthermore, the reasons cited for non-attendance were uniform across both instructor and TA sessions, indicating that barriers are often logistical or related to personal study habits.

To facilitate the broad adoption of this model, we have developed and shared a comprehensive set of TA Training Guidelines. By empowering teaching assistants to act as effective roving facilitators, institutions can scale high-quality academic support to meet the needs of large student populations without compromising the quality of instruction.

As we advance this research, we will continue to conduct focus groups and/or interviews to deepen our understanding of student needs and perceptions. In addition, future iterations of the survey will use more precise measures of expected exam performance and self-reported actual exam performance rather than broad score ranges to support more rigorous quantitative analyses. We will look to answer "How effective are active group office hours at reaching students who stand to benefit most from office hours?"

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