

Work in Progress: Improving Student-Instructor Relationships and Help-Seeking through Office Hours

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Introduction

Strong relationships between students and their instructors have an undisputed link to positive student outcomes such as retention, motivation, sense of belonging, and academic achievement [1]. These observations are particularly important in highly challenging and anxiety-provoking courses [2]. However, the student–instructor relationship is often under-prioritized by educators. Science and engineering courses are frequently taught with a culture of high pressure that is unwisely thought to yield more successful and resilient graduates [3].

Office hours are critical opportunities for both help-seeking related to learning and relationship-building. Many factors may prevent students from interacting one-on-one with their instructors, leading to a perceived inaccessibility of office hours [4]. Students often describe cognitive and emotional obstacles as preventing them from participating in office hours, such as fear of judgment, low task persistence after failure, and uncertainty over belonging [5-6]. These cognitive barriers to help-seeking disproportionately affect under-represented students in STEM, particularly in engineering [7-8]. There is a clear need for new office hours strategies that lower barriers to participation in order to encourage students to build connections with their instructors and access the many positive outcomes associated with those connections.

In previous work, office hours in two BME courses were reframed as a relaxed, communal working space for students to attend without questions prepared, known as “Office Hours: No Strings Attached.” Students in these courses reported higher comfort level when engaging in office hours and when sharing confusion related to the course content compared to a traditional office hours structure [9]. Additionally, a large proportion of the students in that study indicated that they felt that office hours had a positive impact on both their learning of course content and their relationships with instructors [9]. While feedback on the new office hours strategy was overwhelmingly positive, these results were limited to two courses of medium size with above average opportunities for student–instructor interactions. STEM courses can have many different sizes and methods of instruction, all of which can benefit from improved student–instructor relationships. We hypothesize that students in BME courses of larger size with primarily lecture-based instruction who are offered the ability to go to “Office Hours: No Strings Attached” will similarly report more comfort in help-seeking and stronger positive relationships with educators.

Methods

Course Context: The intervention was implemented at a mid-size, private, R1 institution that uses the quarter system. Each of the courses assessed in this work were taught by the Department of Biomedical Engineering and was a required course for graduation for undergraduate students in the BME major. Compared to Courses A and B from previous work [9], the Test Course had a larger class size (>100 students vs ~50) and was taught primarily through lectures without substantial active learning components. Other notable similarities and differences between courses are shown in Figure 1a.

Office Hours Approach: “Office Hours: No Strings Attached” was implemented in all three courses for the duration of the quarter. All instructors, including professors and teaching

assistants (TAs), were coached to hold their office hours as an open working space for all students to participate in regardless of skill or preparation level, and that questions could be addressed on an as-needed basis and/or with other students. Instructors explained the approach to students verbally on the first day of class and with written text in the course syllabus.

Survey Administration and Statistical Analysis: Students voluntarily recruited to the study were surveyed with pre- and post-course surveys. All students, regardless of recruitment to the study, received the same instruction and there were no course/grade incentives associated with participation in the study. Instructors were not informed of which students elected to be recruited. This study (IRB study ID 214633) was deemed exempt from continuing oversight by the IRB. The pre-course survey collected information on previous office hours experiences and attendance patterns as well as demographic information. The post-course survey collected both quantitative and qualitative information about their perception of the new office hours approach and their relationships with each of their instructors. Finally, students were asked to “rate the

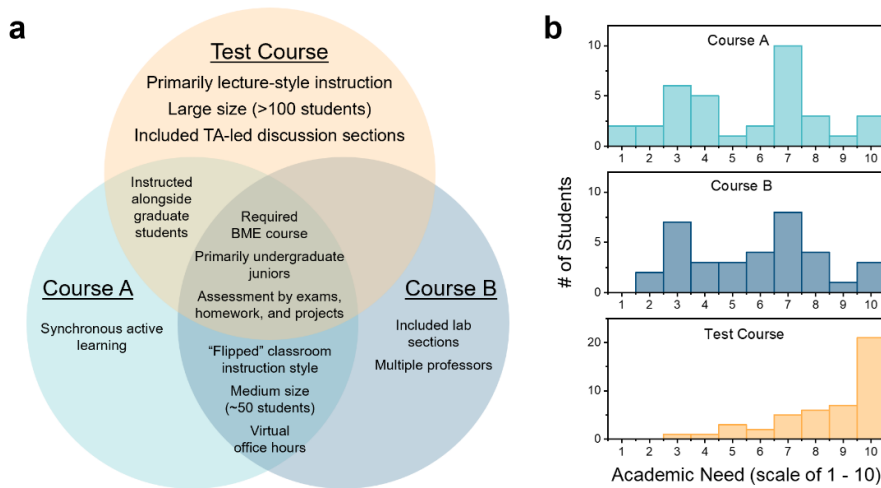


Figure 1. a) Schematic showing similarities and differences between all courses surveyed. **b)** Histogram of self-reported academic need levels from students.

extent to which [they] needed help from other resources to succeed in this course, including but not limited to textbooks, online materials, professor/TA interactions, peers, etc.” in order to assess academic need [5]. Post-course survey questions about barriers to office hours participation were compared using a one-way ANOVA table for each question and post-hoc Tukey’s method.

Results

Student Demographics and Course Context: Of the undergraduate students surveyed in the Test Course (n = 74), 91% were in their junior year, 60% identified as female, 23% identified as a first-generation college student, and 34% identified as an underrepresented minority student. From the post-course survey, we find that another key difference in course context between the Test Course and Courses A and B is the student academic need level (Figure 1b). While Courses A and B demonstrated a wide distribution of academic need, students reported very high academic need levels in the Test Course, with 46% reporting the maximum academic need level of 10 and 89% reporting an academic need level of 6 or greater. Finally, we found that students’ self-reported attendance of office hours throughout the quarter was low, with 50% of students never having attended office hours and 39% having attended infrequently (1-4 times).

Motivation and Barriers to Office Hours Attendance: Students in the Test Course were asked for what reason(s) they typically have attended office hours in previous courses, and approximately 47% of students indicated that “build[ing] relationships with instructors” was a goal of their attendance. Students additionally reported through a free response question that a diverse set of reasons can prevent them from attending office hours. Most importantly, a number

Rate the extent to which you agree with the following statements:

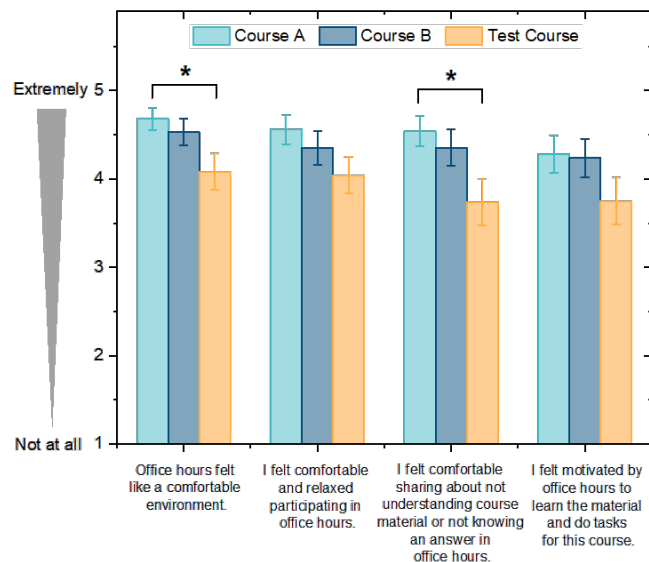


Figure 2. Quantification of cognitive barriers to office hours participation. Error bars represent standard error of the mean. * indicates a significant difference with $p < 0.05$.

of the barriers cited by students in the pre-course survey were those that aimed to be addressed by the “Office Hours: No Strings Attached” strategy, such as perceived judgment, an intimidating atmosphere, and other cognitive barriers (Appendix Table A1).

Finally, we examined student perceptions of cognitive barriers from those who self-reported attending office hours at least once during the course. Students in all three courses reported overwhelmingly positive scores reflecting high comfort and motivation levels related to office hours (Figure 2). Students in the Test Course expressed marginally lower scores than Courses A and B, but only two of the questions showed a statistically significant difference compared to Course A ($p < 0.05$) and no statistically significant differences compared to Course B.

Discussion

The Test Course presents a very different classroom environment than previous courses for which the “Office Hours: No Strings Attached” was implemented because of its large class size, high academic need, and less common individualized interaction with the lead instructor. Students who attended office hours reported very positive scores on their comfort level during office hours, indicating that “Office Hours: No Strings Attached” maintains a comfortable work environment with lowered barriers to engagement in a large lecture course. However, low attendance rates amongst students at office hours suggests that the increased anxiety around the course likely increased cognitive barriers to help-seeking and threshold to office hours attendance despite high academic need. Combined with the observation that reasons that students in the study reported attending office hours and barriers to office hours are consistent with literature, we posit that ideas about office hours are solidified early in students’ college careers and that these beliefs may affect students’ likelihood of accepting new strategies implemented in courses taken later in their college careers. Future work will focus on better understanding the contributions of various factors of classroom environment that create cognitive barriers to office hours participation, and to further counteract these barriers by repeating the intervention in other, potentially better suited courses. These conclusions will inform future implementation of office hours strategies in a diverse array of STEM course structures and student needs.

Works Cited

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Appendix

| Barrier to Office Hours | # of Comments | Sample Comment |
|-------------------------------------|----------------------|--|
| Scheduling conflicts | 11 | “schedule availability and time constraints” |
| Too busy/long wait times | 10 | “too many people attending office hours preventing enough attention” |
| Cognitive barriers | 8 | “worry about whether my questions were worth going to office hours for” |
| Ineffective teaching | 7 | “unhelpful experiences during previous office hours” |
| Broader confusion | 5 | “didn't exactly know what to ask, just needed the entire concept explained again” |
| Lack of preparation by students | 4 | “feeling that I already had to have a strong understanding” |
| Perceived judgment from instructors | 3 | “intimidating professors” |
| Too empty | 2 | “too empty- it feels intimidating for [a] different reason” |
| Formal atmosphere | 2 | “many offices hours that were strict or very formal created an atmosphere that is difficult to freely ask the questions I wanted to ask” |

Table A1. Qualitative reasons that typically prevent or discourage students from attending office hours in previous courses, from students surveyed in the Test Course.