



Experience Report: Meet the Professor - A Large-Course Intervention for Increasing Rapport

William G. Griswold
University of California, San Diego
wgg@cs.ucsd.edu

ABSTRACT

In a large CS class, it's likely that most students will never speak with the instructor. This presents challenges in terms of student engagement. As class time is limited for building rapport, out-of-class interventions are recommended, such as meeting with students in small groups to discuss non-class topics. If an instructor is to meet with all the students, how can the benefits be maximized while mitigating impacts on the instructor's time and students' access to help? What should be discussed? And how beneficial are such meetings, given that they will have to be short? This paper introduces *Meet the Professor (MTP)*, a course element designed with these issues in mind. MTP was deployed in three sections of an upper-division course at UC San Diego. In end-of-course surveys, students broadly reported increases to rapport, most notably finding instructors to be more approachable than they previously thought. Overwhelmingly, students reported appreciation for meeting with the instructor and did not find that MTP interfered with other learning opportunities. Recommendations are provided for managing the instructor's time and maximizing the value of the intervention.

CCS CONCEPTS

• **Social and professional topics** → **Computer science education**.

KEYWORDS

large courses, student engagement, intervention, rapport

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1 INTRODUCTION

An analysis of national surveys on student engagement by the ITiCSE Working Group on Student Engagement revealed that CS achieves lower engagement than other STEM fields and, in the 2017–18 time frame, was getting worse [15, 16]. Motivated by prior research on engineering student engagement [8], their work revealed a disconnect between CS instructors and students on the content of student engagement [15]. In particular, instructors generally

framed engagement through student behavior, such as participation in class activities, whereas students generally framed engagement as an affective (emotional) quality, notably their relationships with instructors, but also, for example, their feelings about the profession. Moreover, CS students rated student-instructor interaction the most poorly of all engagement measures, by a large margin. A likely contributor is the recent growth in students studying CS and the resulting increase in student-instructor ratios [15].

A common recommendation for increasing engagement – for smaller classes – is to meet students outside of class to discuss non-class topics. Commonly, meetings are held early in the term in small groups, with about five minutes of discussion with each student [19, 25]. Although their effectiveness is not in doubt, to our knowledge such interventions have not been assessed for effects on engagement. An additional, key question is how this practice might be scaled up to a large-enrollment class.

For several years, we (the single author) had employed a course element called *Meet the Professor (MTP)* in the required upper-division software engineering course in UCSD's CS program, which hosts 2000 majors and numerous non-majors.¹ Anecdotally, students had cited appreciation for MTP, motivating a formal evaluation. It was hypothesized to find improvements to rapport (and therefore engagement, according to the student framing cited above), as well as for attitudes about the CS profession. It was also hypothesized that students would find MTP worth their time, yet not interfere with getting class help. MTP was deployed in 2022 by two instructors in three 200-seat sections of the software engineering course, and an end-of-course survey was given to assess the intervention.

Echoing the engagement measures on the above-mentioned national surveys, a third of students reported having never spoken to a CS professor at UCSD before, despite the course having a large number of CS prerequisites.² The open-ended responses on the end-of-course survey reveal broad improvements to rapport, and students broadly reported appreciation for meeting with the professor. All the above hypotheses were confirmed. However, many students cited a desire to have more of their questions answered. Students accepted having other students in the meetings, motivating greater use of multi-student meetings to save instructor time.

2 RELATED WORK

2.1 Large Classes and Student Engagement

Large classes are a common topic addressed in articles published by the teaching and learning centers of universities [19, 23, 25, 26].

¹At UCSD, students invariably refer to a lead instructor as a *professor*, regardless of their actual job title. In this paper we adhere to this convention when speaking from the student's point of view, and otherwise use the broad term *instructor* unless specifically referencing a characteristic relating to a narrower job title. We use the term *teacher* in reference to those (likely) teaching pre-college students.

²This was perhaps magnified by remote instruction during the COVID-19 pandemic.

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They and others [11] note the challenges of balancing instructor effort and student learning. A recurring theme is (the need for) increasing *student engagement*. They advocate for the use of active learning techniques such as think-pair-share [12], use of clickers [1, 20], and group work [4, 13]. Using a variety of methods, from classroom observation [12] to student outcomes [13, 17], these have repeatedly been shown to be effective.

Beyond active learning, suggested interventions include instructor practices such as arriving early to chat with a few students [11, 25], learning all students' names to call on them by name [11, 25], and walking around the room during lecture [19]. As class size increases, these become either more time-consuming (e.g., learning student names) or impact a lower proportion of students (e.g., any kind of walking the classroom). Also mentioned is the importance of getting to know the students better, citing challenges such as responding to the diversity in their classes [26], with recommendations for collecting biographical information through index cards or an online survey [19, 25, 27].

A common recommendation, at least for smaller classes, is to meet each student outside of class to discuss non-class topics. Commonly, the meetings are held early in the term in small groups, allowing for about five minutes of discussion with each student [19, 25]. Some suggest offering this as an opportunity [19, 27], whereas others suggest requiring it [25, 28]. A potential problem of an optional meeting, especially with large classes, is that disengaged students will opt out. A potential problem of requiring it, even with the aid of small-group meetings, is the high demand placed on the instructor's time. This paper sheds light on these issues.

2.2 Rapport

An intervention like MTP is not only about instructor and student knowing each other better, but also developing *rapport* – a relationship of mutual understanding or empathy that makes communication easier [14]. Rapport is considered important, even vital, to student learning [3]. In part because class time is so limited, using time outside the classroom setting for developing rapport is recommended [7, 22]. A possible consequence of building rapport is the identification of commonalities between the student and instructor. Such identification has repeatedly been found to improve student outcomes [6]. In Gehlbach et al.'s own controlled study, US 9th grade students and teachers were provided reports of real common interests [6]. At least some of the observed effect was induced by the instructor's increased feelings of commonality with the students, which is hypothesized to have encouraged more equitable grading. Interestingly, the effect was concentrated amongst minoritized students, perhaps because the majority-heavy teacher population already felt commonality with their majority students.

2.3 Emotions and Learning

Research in neuroscience sheds considerable light on the strong influence of emotions on learning. Notably, emotions arise prior to, and modulate, cognition [29]. Positive emotions are particularly vital to learning, and are a blend of feelings of safety (including a sense of control) and happiness. Moreover, with greater emotional intensity comes better learning and recall [2]. As rapport is a positive feeling, it should contribute to learning. This might explain

Gehlbach et al.'s results due to feelings of commonality [6]. Regarding MTP, since the meeting is brief, the resulting intensity of emotion might be limited. However, Gehlbach et al.'s controlled study showed a considerable effect on student grades, yet the students and teachers were merely provided reports of common interests.

3 MEET THE PROFESSOR

We developed Meet the Professor due to feeling a growing disconnect with the students in the required upper-division software engineering class. Due to increasing interest in CS, course enrollments had grown, up to 225 students, and we found it increasingly difficult to motivate and engage the students, even though most would soon have a job related to software engineering. Inspired by a long-lost Tomorrow's Professor [21] e-mail, we added a required meeting with the professor to the course. Over several offerings, this course element was gradually refined into its current form to cope with scaling issues while maintaining the broad parameters of the small-class meeting interventions discussed in Section 2.1.

Meet the Professor (MTP) is worth 1% of a student's grade. During the first day of class the instructor introduces themselves, including personal details such as family and hobbies. As part of covering the syllabus, the instructor quickly introduces MTP. Its deadline is given as several weeks out to encourage students to complete it as soon as possible, and reminders are given in lecture and the Piazza discussion board. Six-minute Google Appointment Slots for MTP are included in the course calendar, during the instructor's regular office hours, two hours per week. The displayed slots include the label "OH/MTP" to make the dual availability clear. A single student signs up for a slot, but is encouraged to bring a classmate or two if they like (e.g., would make them more comfortable). This also has the important benefit of saving time, as it lowers overhead and quickens the pace. If the meetings fall behind schedule, adjacent meeting slots are combined on the fly (with the students' permission). The expected time per student is three minutes, a bit less than recommended [19, 25]. Although the dual purpose of the instructor's office hours might seem problematic, it has been our experience that office hours, especially early in the term, are underutilized. A large number of instructional team contact hours and help are offered through weekly labs, the online discussion board (Piazza), graduate and undergraduate teaching-assistant hours (conducted in the computer labs), weekly problem sessions, and the instructor's general availability after class. A downside for limiting the meetings to office hours is that not all students could complete it early in the term, as recommended [19, 25].

In the actual meeting, after brief introductions, the instructor loosely follows a script of questions about the student. (Recall that the instructor has already introduced themselves during the first day of class.). The questions were chosen according to few purposes, mostly *not* about the course, following best practices [19, 25]. First was to build rapport, with the intent of opening a line of communication that could prove useful later in the term. Second was to educate the instructor about the students' lives. Third was to (re)connect students to their passion for computing and relate it to the current course. Last was to shift student attitudes about professors, e.g., that they are remote and aloof, only interested in their research. In service of many of these goals, the instructor tries to make a connection with each answer. If there are multiple students

in the meeting, these questions are asked in round-robin fashion, which helps keep the students engaged and sustains the pace to avoid falling behind schedule. These are the standard questions:

- (1) *Where are you from?* Students often have strong ties to their home town. Sometimes a student has moved around (e.g., a military family), also a matter of identity. Students from other countries tend to have identity related to their path to North America. Whatever the answer, the instructor draws a connection, expressing a liking for the place for having lived there, traveled there, or simply wanting to travel there some day.
- (2) *How did you discover that computing was for you – something that you wanted to study?* Here the student is being asked for their origin story, so to speak. Students enjoy answering this question, whether getting started in an after-school program at an early age or at UCSD. Again, the instructor tries to make a connection, perhaps with a follow-up question, such as what language was used, or inquiring about their teacher.
- (3) *This course is really different from your previous courses, right? Tell me one thing you are looking to getting out of this course.* This is a bit unique to the software engineering course and its place in our curriculum: Students have taken a surfeit of programming courses, and this course concerns entirely new topics such as requirements acquisition, project planning, team software process, and software design. This question, for one, gives students a chance to reflect on how this course relates to their career goals. The hope is that this connects the course to intrinsic goals (e.g., learning) versus extrinsic goals (e.g., a high grade in the course). Two, it gives the instructor a view of why students are interested in the course. As with the other questions, the instructor follows up with a comment that embraces the students' stated interest, although sometimes carefully nudging the student to a higher-level perspective. For example, students often mention an interest in learning Android in the course project, which is not a learning goal of the course. However, the instructor can build on that answer, mentioning, say, the importance of application frameworks like Android.
- (4) *Do you have a question for me? Course, career, major, anything at all.* Up to this point, the instructor has been asking the questions, so turning it around at the end is critical, even if time is tight. It is a different way for the instructor to express that they care, while at the same time helping satisfy the student's curiosity or needs. Students most often ask a career question, perhaps because the course is so directly relevant to their careers. It might be a question about how to get an internship, what to put on their resume, or about the relevance of Agile software development in industry today.

4 STUDY DESIGN

4.1 Hypotheses

We postulated six hypotheses regarding Meet the Professor (MTP) as a scalable intervention for increasing rapport (and hence affective engagement):

H-PE: Students find MTP to be a (P)ositive (E)xperience.

H-WT: Students find MTP to be (W)orth their (T)ime.

H-NI: MTP does (N)ot (I)nterfere with students' getting help in the class.

H-AP: MTP positively impacts student (A)ttitudes about their (P)rofessor.

H-APs: MTP positively impacts student (A)ttitudes about their (P)rofessor(s) in general.

H-AC: MTP positively impacts student (A)ttitudes about the (C)omputing profession.

These hypotheses drove our study design, including the collection of information that could explain why these may (not) hold.

4.2 Course Context

MTP was investigated in the context of an upper-division software engineering course at UCSD. The program serves roughly 2000 majors as well as thousands of non-majors every year, particularly in the lower division and the beginning of the upper division (where the software engineering course sits). The class is required of all majors, and is popular with non-majors seeking a computing career. Courses are taught in 10-week quarters. The course is taught every quarter, sometimes in multiple sections.

MTP was evaluated in one section in Winter 2022 with 216 students enrolled, and two sections in the following Spring quarter, each with 196 students enrolled. By university mandate, the first four weeks of the Winter quarter were taught remotely, over Zoom. The Spring quarter sections were taught by two professors who coordinated all aspects of the course, such as the team project, labs, and final. Students could complete MTP with either instructor. As the instructors had found that students liked the opportunity to attend office hours remotely, they (and hence MTP) were conducted over a mix of Zoom and in-person meetings.

We (the author) held the meeting as described in the previous section. The other instructor, Joe Politz, took a slightly different tack for the middle "about you" questions. Specifically, after name introductions and before prompting them to ask a question of their own, they asked about the student's year and major, and how their time at the university had gone.

At the end of the quarter, before the final exam, a survey was administered to all students via a Google Form. Participation was incentivized with 1% credit on the final exam. A student could complete the survey whether or not they had completed MTP (although most questions were not answerable), and could also opt out of the study and still receive credit.

4.3 MTP Survey

The MTP survey questions are listed below. The "How apprehensive" and "To what degree" questions were 5-point likert questions ranging from *Not much at all (1)* to *Quite a bit (5)*. There were also background questions, one on "How outgoing would you say you are?", as well as standard questions on the student's major, how they were admitted to UCSD (as a freshman, transfer from another college, or exchange student), their number of years at UCSD, gender identity, and race/ethnicity.

- (1) How apprehensive (anxious) were you about meeting with the professor for Meet the Professor (MTP)?
- (2) Did you attend an MTP meeting with Prof. Griswold or Prof. Politz?
- (3) Did you do MTP in person or remotely via Zoom?
- (4) Who else was in your MTP meeting besides you and the professor? (Check all that apply: None, One or more friends from the class, Students from the class I didn't really know)

- (5) Was this the first time you spoke to a professor at UCSD?
- (6) Was this the first time you spoke to a CS professor at UCSD?
- (7) How do you feel that MTP changed your attitudes about, or relationship with, the professor, if at all?
- (8) How do you feel that MTP changed your views on, or perceptions of, your professors generally, if at all?
- (9) How do you feel that MTP changed your views on computing as a profession for you, if at all?
- (10) To what degree did you find MTP to be a positive experience?
- (11) To what degree did you find MTP to be worth your time?
- (12) Is there any way you wish your MTP meeting might have been different? Fewer/more students, different students? Shorter, longer? Different questions or topics? The way it went?
- (13) All things considered, would you recommend that *the professor(s)* continue running MTP in their classes?
- (14) To what degree did the way MTP was run throughout the quarter reduce your ability to get your class questions answered?

Note that questions 7-9 concern affective engagement, the frame favored by students [15] (See Section 1).

4.4 Data Analysis

Evidence for H-PE, H-WT, and H-NI was directly collected in questions 10, 11, and 14. For the latter three, we rated the open responses from questions 7-9 for being negative (-1), neutral (0), or positive (1). Rating was fairly straightforward, for three reasons. One, the scale has just three values and hence each covers a wide range. This helped for answers like “not much” and “not really”, as the negative affect about a positive outcome was deemed neutral: not enough to matter. Two, for the rare response with more than one statement, the most relevant one was taken, or their median when equally relevant. As an example, for question 7, change in attitudes about the professor, “I do not think it changed much, but I think it was a good idea to increase interactions with the professors themselves” was rated neutral, since the first, neutral, comment is more relevant. Finally, non-responsive answers were excluded (not rated). As an example, for question 8, change in attitudes about professors in general, a student wrote “gave me some tips about going into the workforce.” To assess the accuracy of the ratings, an auditor was recruited to rate a random sample of 5% of the responses (22 per question). The ratings agree 94% with the audit.

The phrasing of each question regards one’s experience with MTP. As such, there can be no actual control group to compare with the intervention. However, a neutral Likert response equates to no effect from the intervention, and no effect is exactly what a group not participating in MTP would experience. Thus, we can apply a one-sample test in comparison to the neutral response. Because the responses collected or rated for testing the hypotheses are ordinal, we assessed them using the Wilcoxon Signed-Rank Test [9]. We performed a two-tailed test, for although each question is stated with a direction (e.g., “positive”), to be conservative, we took the null hypotheses to simply be different than a neutral result.

4.5 Demographics

All told, 566 students completed the survey, and 350 of them completed MTP and opted into the study. Their demographics are typical of others in the major: 18% woman or non-binary, 5% Black, Latinx, Native American, or Pacific Islander, and 25% transfers from another college. The vast majority, 83% of the students, were in

their second or third year at UCSD, with just 2% in their first year. 33% of students reported being shy/introverted, 48% neither shy nor extroverted, and 20% outgoing/extroverted.

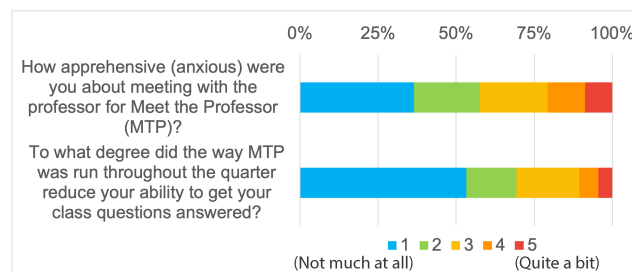


Figure 1: Responses to Negatively-Phrased Likert Questions.

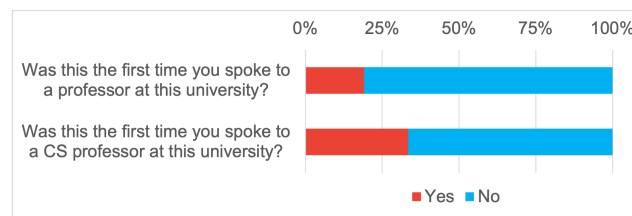


Figure 2: Responses to Negatively-Phrased Yes/No Questions.

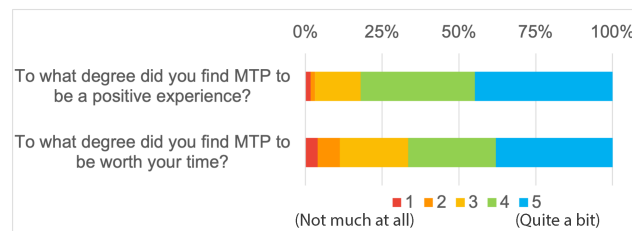


Figure 3: Responses to Positively-Phrased Likert Questions.

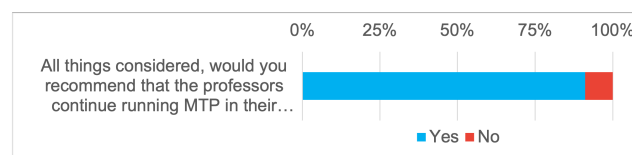


Figure 4: Responses to Positively-Phrased Yes/No Question.

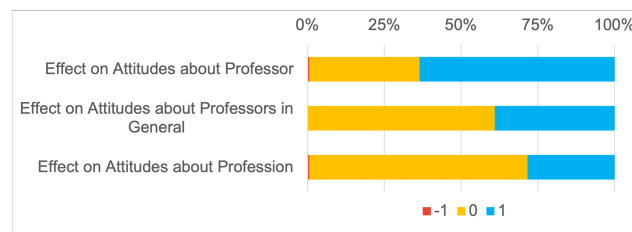


Figure 5: Rating of Text Responses to Questions Regarding Change in Student Attitudes due to MTP (Questions 7-9). There is little-to-no red (-1) to see in the bars.

5 RESULTS

With 98% of students in their second year or beyond at UCSD, and less than a quarter reporting apprehensiveness about meeting the professor (see Figure 1), it is notable that 35% of students had never spoken to a CS professor in their time at UCSD. This puts a local

face on the results of the national surveys on student engagement discussed in the Introduction.

Responses to the Likert questions are shown in Figures 1- 4, and the ratings of questions 7-9 are shown in Figure 5. As summarized in Table 1, all the hypothesis tests passed (i.e., the null hypotheses were not supported), with all effect sizes being meaningful [5]. Effect size is the proportion of positive responses minus the proportion of negative responses, following the natural-effect-size method for the 1-sample Rank-Biserial Correlation Coefficient [10].

Hypothesis	Scale	Median	Effect Size (r)	P-Value
H-PE	1 - 5	4	.79	< 0.01
H-WT	1 - 5	4	.54	< 0.01
H-NI	1 - 5	1	.59	< 0.01
H-AP	-1 - 1	1	.63	< 0.01
H-APs	-1 - 1	0	.42	< 0.01
H-AC	-1 - 1	0	.28	< 0.01

Table 1: Results of Hypothesis Tests using the Wilcoxon Signed-Rank, alpha = 0.05.

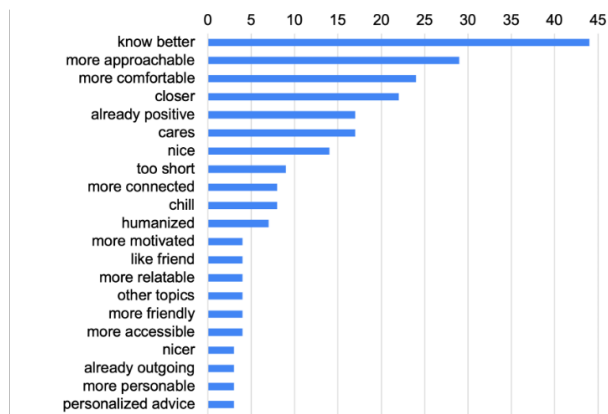


Figure 6: Reasons for MTP's Effects on Attitudes about Professor (three or more responses).

6 DISCUSSION

Meet the Professor is different than the small-class engagement interventions discussed in Section 2.1 in three ways that could reduce its benefits to students: (a) the meeting time per student is very limited, (b) it takes time from office hours, and (c) not all meetings can be held early in the term. The observed effects of these differences are discussed throughout the following.

The Student Perspective. Overall, students find that Meet the Professor has a positive effect on them (H-PE, H-AP, H-APs, and H-AC), while having a minimal effect on their access to help (H-NI). When the student's time is added as a consideration, the positiveness is muted somewhat (effect size 0.54 for H-WT versus 0.79 for H-PE). Although the direct interaction time with a student is just a few minutes and most meetings were held on Zoom (eliminating travel time), in meetings with multiple students the overall meeting time is longer. There is also the time spent waiting for the meeting to start, say if the student has to wait for a prior meeting to finish.

Likewise, there is lower effect size with the added condition of a positive impact on student attitudes about the professor (question 7, H-AP), 0.63. This is not surprising given that there can be other

benefits to the meeting besides improved attitudes about the professor, such as getting a bit of career advice. Students' predominant reasons for improved attitudes about the professor (when given) are numerous (see Figure 6, e.g., the first four items), and mostly relate to increased rapport, a specific goal of MTP.

Regarding the effect of scaling issues on student attitudes about the professor, the short meeting time seemed to detract little (eighth item, too short, 3% of all comments and 26% of comments rated neutral). The timing of the meeting detracted even less (too late, less than 1% of all comments and 3% of comments rated neutral). The predominant reason given for being neutral was that their view was already positive (fifth item, 5% of all comments and 44% of comments rated neutral).

MTP's reported effects on attitudes diminish as the particular attitude becomes more remote from the professor themselves, dropping from 0.63 regarding the professor to 0.42 regarding professors in general (question 8, H-APs), to 0.28 regarding the computing profession (question 9, H-AC). Although this trend is unsurprising, the students' comments are insightful. For students rated with a neutral impact on their views of professors in general, students predominantly cited (a) already having a positive view of professors (50%), and (b) that each professor is unique, making it inappropriate to generalize from meeting one professor (18%). For students rated with a neutral impact on their views of the computing profession, the top factor cited was already having a positive view of the profession (40%). Interestingly, of the positive comments, 48% mentioned the information gleaned about career paths.

The Instructor Perspective. With such positive reported outcomes for students, the remaining question is whether MTP is worth it for the instructors of large classes. This is dependent on the context, so here we discuss the tradeoffs. The benefits of better knowing, having more empathy for, and having better rapport with students were already established in Sections 1 and 2. For instructors that have other means to these ends (e.g., using charisma to establish rapport), the effort required to run MTP can outweigh the benefits. The cost is filling underutilized office-hour time with MTP meetings that could be spent getting other work done. Although acceptable for the course we taught, others could have higher utilization of office hours. At our institution, lower-division classes see much greater use of office hours. One way to save some instructor time would be to explicitly schedule four or five students into each meeting rather than counting on students to bring friends from the class. Most students brought one classmate to the meeting, and in the studied classes, 21% met the professor one-on-one. As discussed in Section 2.1, multi-student meetings are a recommended practice [19, 25], and, anecdotally, we and the second instructor observed that multi-student meetings generally have a higher level of energy and positive affect. Hearing these discussions may also be why so few students cite their discussion with the professor as being too short. In the open responses, a few students cited appreciation for hearing the discussion with other students. Together these suggest that students are benefiting from hearing about other students' backgrounds and the answers to their questions.

6.1 How Could MTP be Improved?

Several points of friction were identified throughout the study, many related to scaling issues. We discuss the top issues here and

list recommendations for improving MTP. The previous subsection already discussed the need to **(a) better utilize instructor time by explicitly scheduling multiple students into small-group meetings**. The open text responses are revealing of how MTP could be more worthwhile to students.

In question 7, the three most cited limitations of the meetings were their short time (26% of all the comments rated neutral), too many people in the meeting (8%), and being too late in the quarter (3%). Using only normal office hours for meetings could explain the last, as it requires a substantial proportion of the students have to meet in the latter half of the quarter. However, procrastination is a bigger part of the problem. In the studied classes, after an initial burst of MTP signups early in the quarter, they tailed off until week 7 of the quarter – the announced deadline for completing MTP – leading to several larger, fast-paced meetings in the final weeks of the class, likely contributing to the first two cited limitations as well. To avoid this, we recommend the instructor **(b) better incentivize earlier participation**, for example, by announcing an earlier deadline and moving it more than once. Employing this tactic in a subsequent quarter resulted in over 70% of students completing MTP through week 7, avoiding an end-of-quarter crush.

In the open responses to question 12, *Is there any way you wish your meeting might have been different*, a longer meeting was by far the most common recommendation. However, since the shortness of meetings minimally impacted the reported effect on attitudes about the professor or MTP in general, the sense is that more would merely be better. Many students acknowledged that this wasn't feasible in the large-class setting.

Many comments focused on the nature of the meeting. Several students reported that the meeting felt a bit one-way and wanted to have had more of their questions answered. One student summed it up, saying “I agree that professor getting to know the students is important. However, I think it is more beneficial for students to have some questions ready and ask professor rather than just self-introduction.” The question topics mentioned by students are wide-ranging, including career advising, the professor's background, and class material. Related, some suggested having a less scripted meeting, as one student put it, “more genuine conversation as opposed to fixed questions.” This is potentially problematic, as the script ensures time on the “get to know you” aspect of building rapport, as well as keeping the meeting moving along. However, following the recommendations of several students (including the one quoted above), a practical solution would be to **(c) ask students to come prepared with a question**. These students attested to not being able to come up with a good question on the fly. Combining preparation with **(d) a smaller list of get-to-know you questions** would strike a balance that could better facilitate rapport. Finally, **(e) the instructor should ask the questions in a conversational, natural manner**. In our experience, this can become challenging after having met with a hundred students.

With the insight that more time should be given to students asking their questions, the best choice of the (fewer) “get to know you” questions remains. Since students predominantly recommended longer meetings over cutting questions, and no question was called out in their comments, there is little evidence for the MTP questions (Section 3) versus those used by the second instructor (Section 4.2). However, the second instructor's script has one fewer question.

Among the MTP questions, question 3, *Tell me one thing you are looking to getting out of this course*, might be the one to drop, as prior work recommends focusing on non-class topics (Section 2.1).

6.2 Limits and Threats

This study was conducted at a single institution, for a single (upper-division) course, taught by two instructors. Still, UCSD is a typical large public research-intensive institution with a typical large CS program that struggles to balance demand and high-quality education. The MTP intervention was designed to combat anonymity and disengagement in the large-program, large-course context. The isolation of remote instruction during the COVID-19 pandemic prior to this study may have magnified MTP's benefits. Replications could provide insight on this influence as well as the generalizability of MTP and how it can be adapted to other contexts.

The effects of MTP were assessed through a student attitudinal survey. The self-reported effects of MTP were tested using appropriate statistical tests, and we resisted making conclusions based on anecdotal information. It was not possible to assess long-term impacts, for example, improved grades, retention, or future success. This study did not interrogate the instructor-student power dynamic and mediating influences such as ethnicity and gender, which could be substantial [18, 24]. Interviewing students or a randomized-control study could provide further insights.

7 CONCLUSION

For CS instructors, engaging a large classroom of students in their learning is challenging, and remains a problem, as evidenced by the results of national surveys on student engagement. Developing rapport equates to improving affective engagement, which is important to students. However, it is difficult to build rapport in a large classroom due to the surfeit of students, limited time, and physical distance between the instructor and most students. Requiring an out-of-class meeting with each student early in the term is one way to overcome these challenges. Although this is a common recommendation, it had not been assessed, and little said about how to scale it up to the large-class context.

Meet the Professor provides a meeting template that balances consideration for the instructor's time and benefit to the students, making use of underutilized office hours. We cite the following top-level outcomes and recommendations from our study:

- The hypotheses evaluated through the end-of-term survey showed that students found (a) increased rapport with their professor, (b) improved views on CS professors in general and the profession, and (c) a required meeting with their professor to be worth their time without compromising access to help.
- Logistics and incentives are important to ensure a preponderance of students sign up early in the term, such as the use of appointment slots, booking multiple students into meetings, and announcing early deadlines that will later be moved.
- As students have a strong desire to get their questions answered, the instructor must balance time for this with the time for the instructor and students getting to know each other better.

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