Applicability of the Discord platform in the advancement of learning in the Introductory to Engineering Design course

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Full Paper: Results of Discord as a Community Engagement Platform in an Introductory Engineering Design Course

Abstract

The 2020-2021 school year required unprecedented reliance on distance-based learning. With this dramatic change came an imperative to understand how to properly structure and utilize an online platform to foster community, education, and inclusion. In this exploratory paper we review the creation of a Discord server and report student usage data and qualitative testimonies for the Introduction to Engineering Design course at the University of Maryland, College Park (UMD) during the fall. If successful, Discord usage would increase frequency of communication, an indirect measure of engagement with the course, between students and thus potentially lead to learning enhancement [1]. The paper briefly touches on four topics; a strategy of implementation and structure of a Discord server, results found from a student survey and interviews, faculty impressions of student behavior, and our conclusions, including future work for upcoming semesters.

Introduction - Creating Communities to Enhance Learning

In the Spring of 2020, the COVID-19 pandemic took all classes from in-person to completely online at UMD. This transition led to a perceived urgent need for student engagement alternatives. Recognizing MOOCs (Massive Open Online Course) have lacked the ability to maintain student attention, and resulted in poor retention of required material [2] and that our own online courses could potentially suffer poor outcomes of 'basic' online education, the authors were motivated to explore ways to enhance this online educational experience. We knew, as L. P. Breslow showed, when students completed courses with a fellow peer or classmate within the same course, or an expert in the field, their performance increased [3]. The benefits of engagement can transfer to an online environment, as seen with prior studies utilizing platforms for community sharing like Edmoto and Facebook [4], [5]. Several sources point to this trend of greater social connectedness, relationships with faculty, and less course-related stress coming from a course with an online community.

Admittedly, our lack of prior experience and an urgent timeline for transition contribute to significant limitations in scope - we created this platform in the middle of a pandemic, and it wasn't created with a preconception to capture research study outcomes. Nonetheless, we choose to report here on the creation of a Discord platform for a first year academic engineering community, to encourage conversation about how to use and grow a digital community, as we believe there to be significant academic value, even post-pandemic. We do not yet have any data on how our efforts to impact engagement affected other outcomes, like student belonging or success. *The aim of the authors is to report on this continuing work and the observations from our pilot semester, which are, admittedly, quite sparse - but suggest rich individual experiences from students and the opportunity for relatively easily executed investment in informal*

engagements with students in the digital space by teaching assistants and faculty to build community.

Why discord? Considerations, Implementation Plans and Impacts

UMD's Introduction to Engineering Design course is group-oriented and required for all engineering students. The fall's online variant covering about 480 eligible students, featured synchronous lecture 3hrs and 40 per week and an asynchronous environment for teams to work. The learning management system at UMD is Canvas, which in past implementations for student engagement was limited to email conversations and 'announcements' from faculty to students and an assignment submission portal. Prior to the pandemic, no such class or department-promoted platform outside of Canvas existed at UMD. Elsewhere on campus, as demand grew for student to student communication in large courses, UMD students formed 'unofficial' GroupMe chats [6]. The majority of GroupMe groups are missing community features like conversation moderation, institutional support, a stated commitment to inclusion, or expert assistance. In the undergraduate author's experience, the lack of oversight in a GroupMe creates an atmosphere more susceptible to academic dishonesty. I have witnessed students being bullied and kicked out of these student groups, as well as the disbanding and reforming of even more 'secret' groups which occurs when perceptions of academic dishonesty surface. These experiences motivated me to agree to create a Discord server with instructor-approved moderation, and an inclusive focus.

Table 1: Author's Evaluation of Pros and Cons of Different Community Apps

	Canvas	Groupme	Zoom	Slack	Facebook	Discord
Desktop + mobile Messaging	✅	✅	✅	✅	✅	✅
Desktop + mobile Video/audio	❌	❌	✅	❌	✅	✅
Student prior experience	✅	✅	❌	❌	✅	❌
Streaming	❌	❌	✅	✅	❌	✅
Shared Governance	❌	❌	✅	✅	✅	✅
Unlimited Messages	✅	✅	✅	❌	✅	✅

Space constraints preclude a sufficiently detailed discussion of each option we considered during platform selection shown in Table 1. The admittedly subjective nature of our evaluation leaves out many Ed-technologies that may have meaningful community. The authors had read about how Discord could be used in the classroom, but little analysis of these implementations. Ultimately the decision was made to use Discord since it could be controlled and managed by students for students while still admitting faculty as administrative and regular users. It has a robust mobile and desktop platform and could house both academic and social spaces without revealing personal details. For additional background on preparing to teach with Discord, we

recommend Skains's article, "Teaching on Discord" [7]. Note, our goal wasn't to replace Canvas as the dissemination point for academics, but rather to create a digital 'water cooler' for both work and social conversations. We admit that other institutions may favor other means.

Our Discord server instance was created in less than 24 hours by the lead author, who was a sophomore teaching assistant at the time. A Discord bot, ENESbot, was also coded and implemented by a teaching assistant. Discord's downside, that students may have no prior experience with the platform, would be overcome through tutorial videos posted to Youtube [8].

Student Onboarding, Server Structure and Function

Notice about the availability of the Discord server was posted to the course syllabus, but participation remained optional to both students and faculty[1]. The only incentive for use was the ability for students, professors, and teaching assistants to connect through social and educational channels during an entirely online semester. Academic messages would continue to be sent from Canvas, and mirrored and discussed in a separate Discord communication channel. 232 students, 15 TAs, and 5 faculty signed up for the server during the Fall. Figure 1 has screenshots of the 'sidebar' organization of our Discord server, which is entirely customizable and reconfigurable.
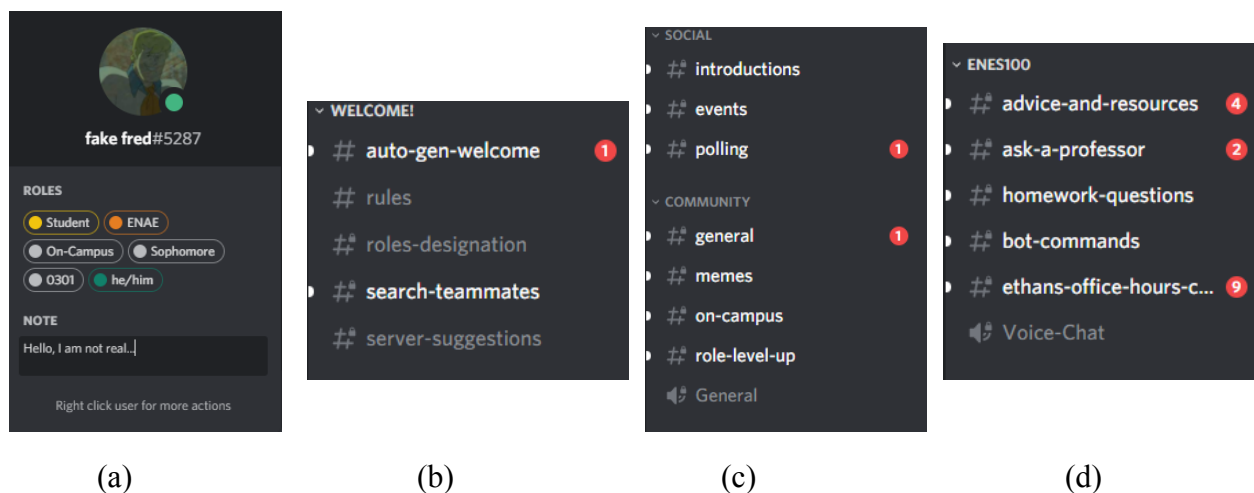

(a)   (b)   (c)   (d)

Figure 1: *Discord user interface for (a) User's profile, (b)WELCOME, (c)SOCIAL and COMMUNITY, and (d) ACADEMIC. When new or unread messages appear in the channel, the channel title bolds in white. When a student user is 'notified' by name or role a red notification appears in the channel to the right.*

USER PROFILE. User names and photos were at each user's discretion. Each user has publicly viewable 'ROLES.' There were special tags for teaching assistants and faculty, as well as on-campus, off-campus status, course section, and expected graduation year.
WELCOME. This category included channels that generated an automated welcome, enumerated the rules, and for users to select roles, search for teammates and make suggestions.
SOCIAL/COMMUNITY. We wanted spaces where students could form a community with each other and were only visible to 'student' role users. The SOCIAL category was centered around increasing inclusion and providing more shy students an opportunity to introduce themselves .

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[1] Spring 21 expanded the pilot from one course to the entire 'Keystone' program of courses -

This included a space for students to add introductions, events that were taking place, and post fun polls. The COMMUNITY section had more conversational elements; with a general message chat, memes, and an on-campus/off-campus channel that varied depending which role you selected. A voice channel labeled 'General' was both video and audio enabled.

ACADEMIC. The "advice-and-resources", "ask-a professor", "homework questions" to engage. 'Bot-commands' for the TA-created bot, and "Voice-Chat" sections allowed for students to speak with, get help from, and create a relationship with their professors and teaching assistants.

Results - Quantitative

Only actions performed by students are shown in the analysis below. The statistical data was gathered using the Discord bot, 'Statbot.' Once a community surpasses 500 users Discord provides community management tools that indicate viewership, and activity to track the 'health' of the community. During this pilot we did not add any incentives or requirements for students to participate.

Students sent a total of 1352 messages within the Discord. 791 of these messages were sent through the Academic channels and 545 messages were sent through the Social channels. None of these messages violated the honor code. Over the span of the semester, there were about 12 messages sent per day with highs of up to 91 messages sent by students, with peaks occurring prior to deadlines of assignments. The top 10 messaging students accounted for about 60% of the total messages sent.

There were almost 13,000 individual minutes spent by students within the voice chat. There were 5273 total minutes in the Social voice chats and 7314 minutes in the Academic voice chats. About 46% of these minutes occured from students during office hours. The top 10 most active students in the voice channels accounted for about 72% of total minutes.

Figure 2: Top student users of voice and messaging channels, portraying the student overlap.

Results - Interviews

Six very-active students were contacted through Discord messaging requesting interviews about their experience. One 'voice' student, Zarkos and two 'messaging' students Velma, and Scooby, sat for interviews in the week of March 8, 2021.

When discussing with Zarkos, he mentioned how he mainly used the server for course related content; this included: office hours, direct messaging students/professors, and projects. Near the beginning of the server, he was rather overwhelmed and confused about how Discord worked. After getting used to the platform's structure, he found it to be an easier platform to maneuver than a zoom call, additionally seeing the server as good for fast communication and versatility. For one of the semester projects, his team made their own Discord and found it useful, not only for the project, but for socializing. This can explain some of the decrease in messaging totals we noticed as the semester finished.
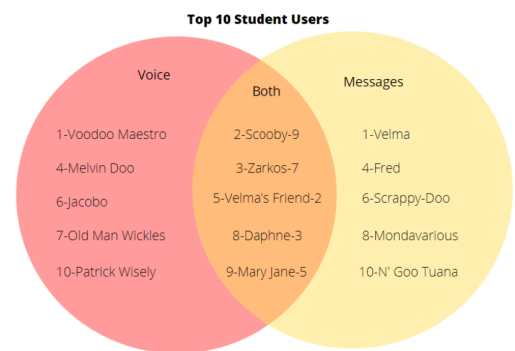
Velma and Scooby were interviewed separately. Enrolled in the same section of the course, but in different groups, they mentioned they became friends in part by trading messages in the Discord server. They both primarily used the server to discuss course content; however, they were active in the student-started Discord Minecraft server. Velma has used Discord previously through her own Twitch community. Velma particularly found the discord to be very helpful saying, "you can't do engineering alone" and found this server to be a hub where somebody is always there, ready to give a prompt response. Scooby found himself being more involved with this class than his other courses and was, "saved from stress being able to ask questions with quick input".

A Faculty's Observations of Discord's benefits

My ability to use online platforms like Canvas to create 'discussion' communities and engage students with course content is a source of great concern. Despite UMD offering resources through our teaching and learning center about how to build more engaging online courses through Canvas, my anecdotal interactions with students indicate that there are a number of reasons why Canvas is not the platform of choice for students to seek guidance or peer interaction. A google search for 'canvas discussion meme' provides a representative sampling of student frustrations. My own experience using Canvas on mobile devices to complete tasks is one of frustration, though I like the desktop client for grading papers and course administration. I desired a platform to discuss course content that was mobile friendly.

The goal of enticing students to join a separate platform moderated and created by student staffers was 3-fold. First, to ensure access wasn't limited to students who are fluent in the 'internet culture,' as invitations to the community would be placed in the syllabus. Second, to provide some visibility and engagement with teaching assistants who would be better prepared to answer homework questions, moderate for cheating, and could lead by example for other students about appropriate online behavior. Third, to create a place for faculty communication to be more accessible (2-way rather than 1-way) among faculty, students, and teaching assistants. I believe an online community with engaged faculty helps achieve a positive culture.

Compared to the spring 2020 semester that pivoted online where I offered office hours over Zoom, my office hours in fall 2020 on Discord were attended at much higher rates. There was a feeling of a 'round-table' conversation, and 24-hour access to a chat channel meant that I (or my TAs) could read and respond asynchronously to student questions. The public nature of question asking also reduced repetition of questions, and, perceptibly, kept me more accountable to students. Asking for teams to share or showcase resources or images of team progress also made a more 'permanent record' of class feedback compared to a zoom chat during lecture.

Faculty to faculty interaction was also supplemented, as I could check-in and observe office hours of other faculty who were active on Discord (4 out of 11) and also assist students in other sections of the course since we shared a common platform for QnA. Occasionally multiple faculty and staff would drop into office hours if there were particularly vibrant conversations occurring. A perk of Discord is the number of participants in a voice channel can be determined prior to joining, unlike Zoom where you must first join the call to see the participants list.

Anecdotally, there were several weeks during fall office hours that attendance exceeded 6 people, a greater number than ever in the spring (or even in-person classes) during office hours.

While canvas creations by faculty can be amazing, interactive learning experiences, my experience with Discord - especially one controlled by students, was doubtlessly enhanced through shared authorship and co-creation. Students suggested and made modifications based on desires and needs, and I heard of freshman students creating their own Discord servers.

Conclusions and Future Work

A Discord community was created in response to the disruption of COVID-19 to an Introduction to Engineering Design course. Our contribution to the literature is unique, we believe, in that this article presents the first reported results of Discord implemented as an optional supplement to our first-year engineering course. We attracted over 200 students, resulting in a total of 1352 messages sent by students as well as 13,000 individual minutes of students speaking in the voice channels. Through interviews, it may be that a voice channel usage is more likely by new Discord users. Additionally, our Discord implementation may initially overwhelm a first-time user. After acclimation however, the benefits of a rapid pace of communication, messaging alerts, and community presence was noted. Notably, though the voice chat was not logged, there were zero reported instances of bullying messages, along with no academic dishonesty. Creating social and academic experiences for students (by students) via the Discord server seems to have been a tentative success.

Further research should be performed including interviews with inactive students and teaching assistants to consider downsides or any impediments to use. More effort is needed to assess potentially uncomfortable feelings experienced in a mixed group of students and faculty, evidenced by a student message, "It's so weird seeing a teacher post memes on discord." A comparison of engagements with Canvas, and a more distributed user survey would help inform changes to our administration of the site. For spring of 2021, Discord communities have been added to 4 other underclassmen engineering courses. Leadership roles for underclassmen students were created to increase the sense of ownership among the now 500+ student members.

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