



Special Issue: Belonging



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Introduction: Special Issue on Belonging

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This special issue considers uses of technology aimed at facilitating our students' sense of belonging. As we received proposals and submissions for the issue, we found the very notion of "facilitating our students' sense of belonging" proved to be a doorway to a rich context with a diversity of purposes for using technology and a multitude of tools. As our authors broke down the meaning of "sense of belonging," they often identified that feelings such as respect, courage, and importance, were at play. They found that *relatedness*, thinking of oneself as a member of a group or community, matters.

"Relatedness" (Rock, 2008) is an aspect of a social neuroscience model (SCARF – status, certainty, autonomy, relatedness, and fairness) that addresses rewards and threats that humans inherently feel and means that diverse perspectives must be supported. When students feel safe sharing their thoughts and ideas, they are in a reward-approach response space neurologically, and will continue to be curious, eager to learn, and open to brave space discussions. Triggering the "R" in SCARF has the potential to touch the other components of SCARF, further increasing the positive learning environment and belonging. From this model, we can see that when an environment does *not* contribute to rewarding our sense of status, certainty, autonomy, relatedness, and fairness students shut down (avoid interaction) because they feel threatened. We believe our authors identify methods that create a sense of belonging because they create moments when students feel socially rewarded for being in and contributing to the community.

"Intentionality" came up in many of the articles. The authors deconstruct courses and design with both belonging in mind and a commitment to purposefully make use of technology. Each author showed us spaces where designing with this intentionality created opportunity for students to matter, to interact, to best express their learning, to make meaning, and to identify with content, each other, and their instructor. While "match the tool to the purpose" may not be an unexpected takeaway, it is a powerful one. Another powerful takeaway stems from our authors' combination of research on learning and teaching, the research on belonging, and the wide range of technology tools available to us: We suggest failure to consider belonging in teaching and learning, because it is critical for students' wellbeing and mental health, is inexcusable in today's environment. The first step toward addressing belonging is commitment to our own growth as instructors. Once we learn enough, whether about teaching practices, learning science, technology, or course design, then second, we can identify one opportunity in our classes to support belonging and design for it. Before long, with ongoing commitment to our growth and creating opportunities to foster belonging, our courses will more fully and inclusively support our students.

Flow of Articles Throughout the Issue

This issue begins with our *Quick Hits* because we want to introduce that the intersection of belonging and technology can be implemented into activities, rather than instructors being overwhelmed with attempting to design an entire course with intentional design toward belonging. Readers will learn

about three distinct technological integrations: Link to Life and Learning (L2LL), video-based discussion using the Flip platform, and the classic six-word memoir (SWM). While readers may be familiar with these activities or technologies, the uniqueness is their connection to belonging while learning with technology. Following the Quick Hits section, a *critique* offers suggestions of how using two common technologies, Facebook and makerspace, could be evaluated and enhanced to address belonging.

The focus of this issue then turns toward three *reflective essays*, offering an interrogation of course design through different lenses. The first considers a role for applying positive psychology, the scientific study of human and organizational flourishing and thriving, which underscores belonging as a basis for wellbeing. The second essay focuses on the importance of a throughline for belonging supported by technology that centers student voice and agency. The final reflective essay introduces a framework of course design for belonging and inclusion based on Schwab's (1973) commonplaces of learning. These essays provide readers with theoretical frameworks for designing a course with intentional and purposeful use of technology to increase students' sense of belonging to aid teaching and learning.

The final section of this issue presents four *case studies*. The first one has an emphasis on Universal Design for Learning (UDL) and builds on the theme of course design from our reflective essays. The second case study connects readers back to specific technologies, like the Quick Hits and critique, where the authors examine the use of Facebook Live for faculty and student readings, online conferencing for an alumni career panel, and an online publication tool for a celebration of student writing. This online publication tool is also a prominent aspect of one of the reflective essays, so it is interesting to note its use in multiple submissions. The final two case studies are situated with an international student focus related to collaboration. We finish the issue with these two submissions to highlight a global lens to belonging, technology, teaching, and learning.

Concluding Remarks from Co-Editors

We hope this issue supports your efforts to make belonging a crucial element of your courses. While our authors approach designing for belonging in many ways, interactivity is one characteristic that fueled all approaches. That is not surprising. Through our own reliance on technology-supported interactivity in our daily communication, we know it can help our communities thrive when used well. In fact, this intertwining of interactivity and community also appeared repeatedly in the articles. Designing courses or parts of courses for interactive community engagement supported by technology can lead students to feel inspired, hopeful, open, inquisitive, and confident. We see students feel an increased sense of belonging and achieve meaningful outcomes in courses that create avenues for interactivity, especially as a community of learners. Student choice to support engagement also came up in many of the articles. In this vein, many of the articles explicitly focused on Universal Design for Learning or developing a Community of Inquiry to support developing a sense of belonging.

Finally, as we read through and discussed the articles for this issue, we kept circling back to the SCARF model as an applied entry into belonging in the classroom. Designing for belonging reaches both instructors' and students' innate reward-approach center in our brains. A literature review of this model suggests that it is used more in management, leadership, and coaching situations; however, it might serve as an avenue for future research related to belonging in the classroom. With an increased awareness from the field of social neuroscience, we reinforce intentional and purposeful use of technology for learning and course design. We create more meaningful spaces for our students to belong.

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Link to Life and Learning: Integrating Quick Assignments to Encourage Belonging

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Abstract: At an institution which serves mostly commuting students who are first generation and often balancing life responsibilities, online learning is enticing and presents challenges. Students can struggle with the required skills of self-regulation, effective time-management, communication, and balancing needs. In the spring of 2022, an innovative teaching practice was added to an online first-year seminar course called Link to Life and Learning. Each week, students completed a low-stakes assignment which addressed a variety of factors related to belonging in college including: a reflection about the purpose of a college education, reading to comprehend, health and wellness, diversity and inclusion, procrastination, healthy relationships, involvement on campus, school-life balance, and individualized meetings with the instructor. These assignments were created in a personalized manner that fit the needs of the students and the campus, while encouraging students to develop a connection to their purpose, passion, and sense of belonging.

Keywords: Online learning, student belonging, technology.

The rise of online learning has promoted a culture of access and flexibility; yet, it has also challenged connection and student belonging. A cultivated sense of belonging can lead to persistence and success (Gopalan & Brady, 2019). Developing a personal, caring relationship with students through an online learning platform can be challenging (Thomas et al., 2014). Yet, we know that professors are integral to establishing a productive and motivational learning environment which fosters students' belonging and life-long learning, regardless of the teaching mode.

First-Year Seminar (FYS) courses help students create social connections, develop life skills, and establish a foundation of acclimatization (Jajairam, 2016). FYS courses are particularly helpful for first-generation students, who reportedly have a lower sense of belonging (Strayhorn, 2012; Walton & Cohen, 2007). Our institution is a regional, comprehensive public institution with a population of diverse students, a high number of first-generation students, and primarily serves commuting students. FYS courses are traditionally taught face-to-face; however, the course described here was one of the first to be offered in an asynchronous online format in spring 2022 for 24 students. The course, HSC-B190: Flint Water Crisis, served several purposes: fulfilling the general education requirement of Human Behavior and Social Institutions, serving as a FYS, and executing a personal passion project for the author on this topic. The course deconstructed the water crisis in Flint, Michigan, through a public health lens with examination of *What the Eyes Don't See: A Story of Crisis Resistance and Hope in an American City* by Dr. Mona Hanna-Attisha.

I believe it is the professor's responsibility to try to humanize an online course and create a space that encourages engagement, albeit this can be a difficult task. As a FYS course, the magnitude of purposeful human connection was crucial to supporting student success. In the learning management system, students completed a weekly assignment called Link to Life and Learning (L2LL), which is a unique assignment to this course. These assignments reflected innovative integration of the campus objectives of a FYS course through a reflective and personal five-point

assignment which amassed to 15% of the overall grade. One paid Peer Mentor was assigned to this course to provide engagement, support, and mentorship to other students. The Peer Mentor had experience mentoring in a face-to-face course, but not online. In fall 2021, I met with the Peer Mentor to discuss the vision of the course and to brainstorm relevant success-related topics knowing the likely student population. The next sections will discuss the integration of some of the creative technological strategies that the Peer Mentor and I designed and implemented to increase caring, belonging, and reflection for enrolled students.

The introductory module included a recorded video of me explaining the syllabus in detail and reading the diversity and acceptance statement, which I include in all syllabi. In this module, students complete the following: upload a picture for profile personalization; complete the name pronunciation tool (i.e. NameCoach¹), add preferred pronouns (if desired), provide video introductions to the class, and complete brief assessments (i.e. QuickChecks²) to acknowledge reviewing the syllabus and course expectations. These low-point value assignments are valuable in connecting with students personally and creating an inclusive teaching and learning environment (Sathy & Hogan, K.A. (2019). I want to know the humans behind the assignments as much as I want them to know I am an engaged human, too. I commit to weekly check-in emails, prompt grading, frequent video comments in assignments, and always personalize comments to the student addressing their submission.

One may assume that students of this generation, in a FYS course, have had enough online learning experience to be comfortable with a myriad of technology, especially as we have transitioned away from the impact of the COVID-19 pandemic. Yet, the variation in pedagogies, experience, and learning management systems can lead to a difficult transition in higher education, particularly for the aforementioned student population. The first L2LL assignment was called “Success in Online Classes.” In this assignment, students are introduced to a variety of accessible *free* tools including printable calendars, links to how to use electronic calendars for college students, and podcasts focused on time-management strategies. Each section also involves a video and transcription of strategies used by the Peer Mentor and me. The Peer Mentor included the following advice for students:

I have a whiteboard calendar in my room as well to show me due dates and upcoming events. I use sticky note reminders, for things I don't want to forget as well. I put them on my front door so when I leave the next morning I won't forget, on my desk, or on my bedside table. Instead of using a planner, I recently started using to-do notebooks instead.

I shared pictures of my campus, home workspaces, and my notebooks and electronic calendar which encourages personal and human connection (Sathy & Hogan, 2019). For assessment of this assignment, students uploaded a picture of what organizational system they will use and a reflection on previous strategies that have been successful, effective, and unsuccessful.

Another L2LL assignment explored the notion of “Why College?” This module is designed to help students reflect and share the root of *why* they are at an institution of higher education. Although I share my college journey with students, my professional experience at this institution has taught me that my journey is not very similar to that of my students. This assignment included TedTalks about the topic, information about the structure of their institution, the history of higher education, and a connection to the campus career services office. The connection to the career services office included a link to get monthly email updates, information on the once-per-semester career fair, and a time-lapse

¹ NameCoach is an integrated tool in Canvas which allows students to record pronunciation of their names, provide phonetic spelling, and store pronouns.

² QuickChecks are embedded assignments into Canvas with provide low-stakes assessments which provide immediate feedback and allow the instructor to track analytics.

video of how to get from the main parking lot to the career services office. In their assignment, one student shared, “I really liked how she explained everything in the video. It made things make a lot more sense in my head and made me start strategically thinking. So, I just wanted to say thank you for that video. I enjoyed it!”

Some other academically-focused L2LL assignments include “Reading to Comprehend,” “Involvement on Campus,” “Honesty and Plagiarism,” and “Procrastination.” These assignments were strategically placed during weeks in the semester where a dip in performance is typically experienced. These topics include a compilation video of me reading the class book in a variety of places (kitchen table, school pick-up line, curled up on the couch, at kid’s sporting activities, etc.) with a recorded explanation of how highlighting and note-taking helps me to comprehend what I read, a skill I learned when I was an undergraduate student. One student shared, “I think I know plenty of skills and strategies to be successful, but it is just dependent on whether or not I implement them.” To encourage use of campus resources, we provided time-lapse videos traveling to great study places on campus, tutoring and writing centers on campus, the Titan Student Success Center, and questionnaires to help students evaluate, reflect, and integrate campus-level supports.

To provide additional supportive connections, the L2LL assignments address “Health and Wellness,” “Equity and Diversity,” “Balance,” and “Healthy Relationships.” These topics were selected as this course is based in the Division of Health Sciences and my previous experience teaching first-year students. Additionally, these topics connected well to the required reading. The assignments encouraged students to learn about additional campus resources such as the Student Activity Center, Health and Wellness Center, the Civil Rights Heritage Center, and Counseling Center. These are resources not historically known on a campus comprised of mostly commuting students. The assignments also highlighted programs and workshops through the university’s health and wellness and recreation programs. One topic of particular importance for college-aged students is healthy relationships. While students were not required to provide examples of their personal experiences or stories, several did, and one shared this: “I watched all the videos and looked into the websites [from the OneLove Foundation]. It’s really great to see all of these resources in our communities.”

As an experienced online instructor, I can share that integrating these components into an online course was challenging, but incredibly rewarding. One student provided this comment on the course evaluation:

I’ve never had a professor do this before, so this is really amazing to see that you opened not only my eyes but so many other students’ eyes to live a healthier life! So, on behalf of everyone thank you! We need more professors out there like you who truly care and want to see students succeed. It makes me want to do even better and improve even more when I feel like I have someone who cares like that, so thank you very much!

The development of the Link to Life and Learning assignments required a great deal of creativity and authenticity and were intentional for a supportive and inclusive asynchronous learning environment. The reflections provided in this article demonstrate that the course provided care and support in an online course; however, the strategies can also be implemented in face-to-face courses. The hope is that by providing access to opportunities, students are more likely to feel a sense of belonging and seek out and utilize campus resources, which furthers success and belonging (Strayhorn, 2012; Yeager et al., 2016).

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Adding Technology to the Six-Word Memoir to Foster Belonging in Online Classes

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Abstract: Belonging, or the feeling of being a valued member of a community, has been linked to numerous positive outcomes in higher education. Although creating a sense of belonging at the campus level is important, equally important is fostering belonging in the classroom. Research has shown that belonging is more likely to occur in classes where students connect with one another, feel as if their voices are heard, and engage in repeated positive interactions with their instructor. Meeting these standards can be particularly challenging in online classrooms, but with the strategic use of digital technology, it can be done. In this Quick Hit, I describe how I integrated technology into a classic assignment, the six-word memoir, redesigning and transforming it into a learning activity that can help build a climate of connectedness and belonging in both synchronous and asynchronous online classrooms.

Keywords: classroom community, belonging, online teaching, six-word memoir, learning activity

Framework

Belonging has been linked to positive outcomes in higher education, including academic success (Kirby & Thomas, 2022), retention (Morrow & Ackermann, 2012), self-efficacy (Freeman et al., 2007), and engagement (Wilson et al., 2015). Although creating a sense of campus-level belonging is important, Wilson et al. (2015) argued that classroom-level belongingness has an even stronger impact on academic success, making it particularly important for classroom teachers to implement pedagogical practices that help students feel as if they are valued and respected members of the community.

Research suggests that belonging is more likely to occur if students (1) feel as if their voices are “heard and honored” (Thiers, 2022, p. 13), (2) connect with one another, and (3) engage in repeated positive interactions with their instructor (Johnson et al., 2007). Meeting these standards in online classes can be challenging, but with carefully designed and implemented learning activities that make strategic use of digital technology, it can be done. This Quick Hit describes how I integrated technology into a classic assignment, the six-word memoir (SWM), redesigning it with a focus on helping to build a climate of connectedness in synchronous and asynchronous online classrooms.

Assignment Description

The SWM, an initiative started by *Smith Magazine* in 2006, invites individuals to share their story in just six words. Legend traces the idea back to Ernest Hemingway, who allegedly responded to a similar challenge with this poignant six-word story: “For sale: baby shoes, never worn” (Six Word Memoirs, n.d., para. 1).

Using the SWM as a learning activity is nothing new. In fact, it is used in many types of classrooms, at all age levels, and in support of a wide range of learning outcomes. Adding technology to the activity is also not that original. Indeed, *Smith Magazine’s* initiative has evolved into a robust

multimedia platform with contributions from over 1.5 million users (Six Word Memoirs, n.d.). What is unique about the approach I describe in this Quick Hit is the combination of this relatively common learning activity with technology for the purpose of intentionally fostering a sense of belonging in a classroom. I have successfully used this learning activity in a variety of contexts, ranging from introductory classes in communication studies to the capstone course for graduating seniors to graduate-level seminars.

The steps involved in implementation are:

1. Instructor creates a prompt that invites a story.
2. Learners write their story in six words.
3. Learners share their SWMs using appropriate technologies.
4. Learners converse with classmates about their SWMs.

Making It Work

This section provides details about implementation and explains how each step is designed to facilitate connection and belonging.

Designing an Appropriate Prompt

The key to designing an appropriate prompt is to invite sharing a story. Stories are recognized as an “effective strategy to promote and expose the common connections that lead to positive relationships” (Rhodes, 2019, para. 1). In introductory classes, I use the prompt “Tell the story of who you are in just six words.” In the capstone course, the prompt is “Write a six-word professional identity memoir that tells the story of who you are as an emerging communication professional.” I have also invited students to generate six-word stories that relate personal examples of course-related topics. In a group communication class, for instance, the prompt might be “Think of a specific group encounter that did not go well. Now tell that story in just six words.”

Inviting Learners to Write Their Memoir

The next step is to prime students to write their SWM. After introducing the concept, providing some examples, and talking briefly about the components of a story, I give students time to think of the story they want to tell and to distill it to just six words. In graduate-level classes, I sometimes supplement the assignment with a reading (i.e., Simmons & Chen, 2014) that provides a meta-level understanding of the task. I always remind them that they will be asked to share their memoir, so they should write only about things they are willing to disclose.

Sharing SWMs Using Appropriate Technologies

When I first started using the SWM in face-to-face classes, students would simply read their memoirs in small groups or to the class. As I moved to online teaching, I modified the assignment by integrating technology into sharing and discussing the memoirs. In asynchronous online classes, students use digital technologies of their choosing to turn their SWM into an “e-postcard” they can “send” to their classmates. Although I let students select the technology they want to use, I recommend tools such as Adobe Express that are available at no cost to students at my university. In the assignment details, I provide links to tutorials demonstrating how to use the tools.

In synchronous online classes, I generally use a “chat blast” to share the memoirs. Students are given time in the session to generate their SWM. They are asked to type it into chat but not press send until instructed to do so. When the writing time is up, I ask everyone to press send, and the chat box explodes with six-word stories that students can scroll through and read on their own computers. This activity supports the goal of fostering a sense of belonging because it allows students to tell their own stories and be heard. According to Barron and Kinney (cited in Thiers, 2022, p. 13), “When students feel their voices are heard and honored, it has a significant impact on their willingness to engage, participate, accept and include others’ voices, put forth effort, and improve their own outcomes.”

Connecting Learners With Each Other

The final step is providing opportunities for learners to connect with each other. Belonging is, after all, relational, “the experience of mattering or feeling cared about, accepted, respected, valued by, and important to the group” (Strayhorn, 2012, p. 3). Kirby and Thomas (2022) suggested that essential to building cohesiveness is forming a united whole and helping students get to know each other. The SWM is a robust tool for meeting these goals. Because the text form forces a person to tell a story so concisely, much of the story is implied, opening the door to further conversation. In a recent capstone class, for example, a student shared the SWM “Turning my weakness into a career,” which aroused interest but left classmates with questions. The student explained that as a child, she was reprimanded for talking so much, and her major lets her take that “weakness” and put it to good use. Another student’s SWM, “I’m feeling lost at the crossroads,” gave students a chance to discuss the uncertainties many of them were feeling about graduating.

The stories told through the SWMs provide clear connection points, but in online courses, learners need virtual spaces for those conversations. The technologies are adapted to the delivery format of the class. In synchronous online classes in which I use the chat blast described above, I use the chat as a conversation space. If the class is small enough, I invite students to unmute themselves and interact directly with one another. If the class is large, I create breakout rooms for conversation in smaller groups. In asynchronous online classrooms, I use discussion spaces to facilitate learner-to-learner interaction. Because the e-postcards are visually interesting and include only six words of text, students can easily scan through their classmates’ stories and move more quickly to interaction.

The conversations that typically take place around the SWMs create a climate that builds community and fosters a sense of belonging. They allow students to identify points of connection, encourage perspective taking, and provide a site for interaction. Although I have not formally assessed the relationship between this activity and students’ sense of belonging, feedback from students has been positive. On course evaluations, students have identified this assignment as one of the most valuable aspects of the class. One student noted, “I really enjoyed creating my introduction postcard.” Another wrote on an in-class feedback form:

When we were asked to introduce ourselves by writing a story in just six words, I thought, no way! But in the end, I was pleased with what I came up with. It actually helped me think through how I see myself as a communication professional. I liked hearing how others see themselves and it was nice to learn that I’m not the only one who still doesn’t know what I want to do when I graduate!

This activity also provides opportunities for repeated, positive interaction between learner and instructor, another key to creating a sense of belonging in a classroom (Johnson et al., 2007). I build this into the SWM learning activity in two ways. First, I complete the assignment myself and

post my SWM in chat or in the discussion space. This allows me, as the instructor, to become part of the community that is being created. Second, I create a spreadsheet of my students' SWMs and refer to them as I interact with learners throughout the semester.

Future Implications

I have found the SWM to be a highly adaptable learning activity that can be modified to serve a wide variety of course delivery formats, topics, and learning outcomes. It is particularly well suited to creating a sense of belonging because it honors students' voices, contributes to building a sense of community within the classroom, and provides a foundation for meaningful learner–instructor interaction.

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"A Great Way to Connect": Using Flip to Promote Connection and a Sense of Belonging in Online Courses

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Abstract: The growth in online education has prompted a focus on ensuring students are engaged, persistent, and successful in their studies. A recognized challenge with online learning is developing a community of learners, where students feel connected to their peers and instructor and experience a sense of belonging. In this article, we highlight using the platform Flip to engage students in video-based discussions. We describe our use of Flip in two online asynchronous courses and provide recommendations for instructors seeking to embed this tool in the learning experiences they develop for their students. In addition, we present our students' perspectives on belonging within the course and their use of Flip, collected using an anonymous survey. Last, we examine the advantages and challenges of using this tool and discuss the implications for promoting connection and belonging in online courses.

Keywords: sense of belonging, distance learning, online learning, college student, video-based discussions, discussion forums, self-determination theory, Flip

Framework

Higher education was experiencing a growing trend in distance education even before the COVID-19 pandemic (U.S. Department of Education, National Center for Education Statistics, n.d.). With this growth comes the urgency of ensuring student success. A challenge with online learning is developing a community of learners where students feel connected to their peers and instructor (Oberne, 2017). Further, replicating the dynamics of the face-to-face classroom is challenging, since owing to the nature of distance education, students and faculty are separated by time and location (Draus et al., 2014). Attempting to address this challenge is important, with implications for student persistence and success in postsecondary education (Moore, 2014).

According to self-determination theory (Ryan & Deci, 2000), relatedness or belonging is a basic psychological need. In the university context, students need to develop a sense of belonging and perceive themselves as a member of a community (Ryan & Deci, 2000, Tinto, 2017) where they feel valued and included. Relatedness or belonging might come from feeling connected to peers, instructors, or various groups. Students who perceive themselves as members of a group are more motivated to learn (Gurjar, 2020) and more likely to persevere (Tinto, 2017). However, in the absence of face-to-face interactions, instructors in online environments must seek ways for students to develop a sense of community, participate in conversations, and engage in exchanges that validate their experiences (Cherney et al., 2018; Moore, 2014).

Making It Work

Students' sense of belonging in online courses can be shaped in many ways; here we focus on the use of video-based discussions. As a medium for communication, video is richer than audio or text because it provides access to nonverbal cues (e.g., gestures, facial expressions, voice inflection), leading to an increased social presence and deepening learning (Cherney et al., 2018). In this article, we highlight the platform Flip (see info.flip.com) for video-based discussions. Flip is a free, asynchronous video-based online discussion tool that allows students to interact with others in a fun and engaging way. The use of Flip for video-based discussion presents multiple advantages, such as increasing student satisfaction with the online learning experience (e.g., Bayram, 2013). Research has also shown that Flip improves social presence (Lowenthal & Moore, 2020), deepens reflective skills (Isidori et al., 2021), and helps create a sense of community in online courses (Delmas & Moore, 2019). Instructors can use Flip to transform text-based discussions into dynamic conversations that can build a community of learners. In Flip, instructors can create groups and unlimited topics within groups to pose questions that facilitate discussion. This format gives students time to craft a thoughtful response, minimizing discomfort for students who might struggle with fast-paced, synchronous discussions. Furthermore, the option to add text, emojis, drawings, and cover image selfies promotes creativity and provides a familiar social-media presence for students, but in a private space. Flip is intuitive to use from any internet-connected device. Feature articles and guides for using Flip can be found at help.flip.com.

We each opted to use Flip in an online asynchronous, undergraduate spring 2023 course (37 students total) at a small, regional campus as an alternative to text-based discussion forums. To make it work, our experience has led us to recommend the following:

- First, create your course group and topic boards for each discussion. Flip provides a join code link that instructors can share with students, allowing them to securely join using Microsoft or Google accounts.
- Second, begin with an introductory forum to start building community and belonging. For example, in Kingsley's children's literature course, students first completed a low-stakes assignment to try out the platform while engaging in peer-to-peer interaction. After introducing themselves, they shared their course goals and favorite children's book (see Figure 1). Model expectations by posting an instructor introduction. Add camera effects such as text and stickers to showcase ways to make a video informative and fun.
- Third, maintain the rigorous expectations of text-based discussions in this new format. In our courses, we wanted students to show evidence of learning through synthesis and critical thinking. Therefore, Flip discussion prompts and the assessment rubric paralleled our former text-based discussion assignments. This required students to ask questions, make connections, share opinions, and reference the module's readings within their video posts. Additionally, students were required to reply to two or more classmates. We provided several prompts to springboard student thinking, rather than to serve as a checklist for responses. We asked students to craft a personalized reflection based on the key ideas they were interested in discussing. We encouraged a "come as you are" approach, emphasizing progress over perfection and normalizing stumbles in narration. A sample student Flip response from one participating course can be found at <https://tinyurl.com/mwzschbk>.¹

¹ Shared with student permission.

- Last, allow student interactions to flourish first before jumping in. As course instructors, we focused on being a "guide on the side." We engaged in conversations to demonstrate an interest in student contributions, pose questions, or suggest additional areas to explore, such as current events or high-interest news articles that aligned with the topic. Students appreciate knowing the instructor is present and viewing their work. As a time-saving tip, save instructor responses in a Word document or as videos to reuse. We found that students each semester tended to share similar responses, and a few minor tweaks to a saved post will save a great deal of time!

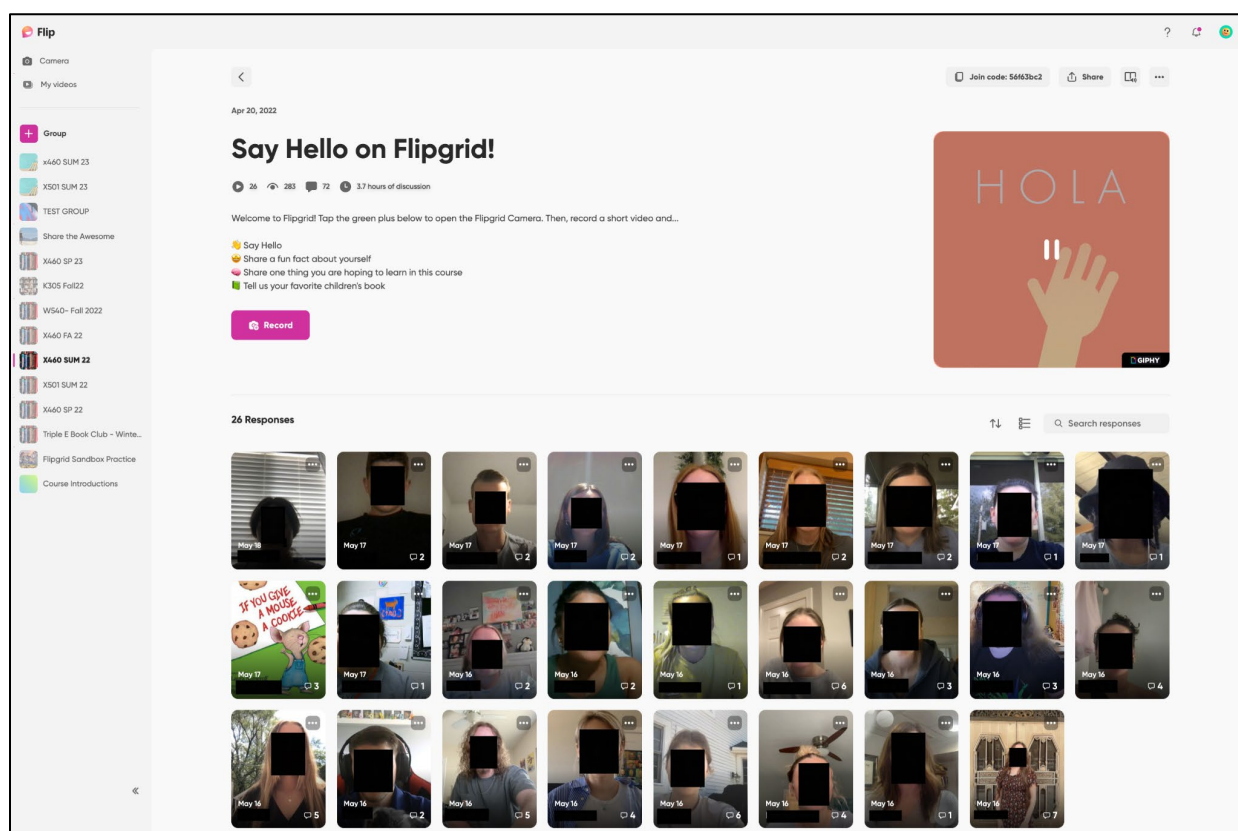


Figure 1. Print screen of Flip introductory discussion forum.

We were interested in assessing our students' perceptions of belonging within these courses; therefore, we sought approval from our Institutional Review Board to anonymously survey students at the end of the semester. We used the Brief Course Belonging Scale (BCBS; Lingat et al., 2022), which is informed by Tinto's model of retention (Tinto, 2017) and consists of 11 Likert-scale questions. We added two additional open-ended questions to better understand student perspectives on using Flip. The questions asked students to describe the benefits and challenges of learning in this format.

Results

On the BCBS, the mean average for all questions was 3.56/4.0, indicating students felt a sense of belonging between the *agree* and *strongly agree* levels (see Table 1²). In the open-ended responses, 86%

² Shared with permission; Lingat et al. (2022).

of students reported the greatest benefit of Flip being a feeling of social presence. Comments such as "It [Flip] allows for emotion to be known and connects everyone better than written discussions," "I like hearing how people feel," and "I feel like we are having more heartfelt conversations" demonstrate that students felt connected, thus promoting a sense of belonging when engaging with peers and instructors in this platform.

Table 1. Means for Brief Course Belonging Scale responses ($N = 36$).

Question	Mean
I feel like my contributions during class activities matter to other students in the course.	3.42
I feel appreciated by other students in the course.	3.56
I want to keep in touch with other students after this course is over.	3.39
I feel like other students in this course encourage me to do well.	3.44
I feel respected by other students in this course.	3.67
I feel like other students in this course accept me for who I really am.	3.64
I can be myself with other students in this course.	3.64
I feel like other students in this course understand my ideas when I share what I am thinking.	3.64
I feel supported by other students in this course.	3.69
If I face academic challenges in this course, I feel comfortable asking other students for help.	3.53
I feel included by other students in this course.	3.50

Note. Responses were given on a scale of 1 (*strongly disagree*) to 4 (*strongly agree*).

Flip also presented some challenges for students, including time restraints and meeting deadlines; however, the biggest challenge for students was feeling comfortable with recording themselves, with 39% of students sharing hesitation with the process (e.g., "I think the hardest part of the Flip discussion is getting comfortable with recording"). Nonetheless, for some students, being on camera became easier with practice. Survey comments such as "To be candid, it took some practice to just stop caring about my recordings" and "It was awkward at first, but I got used to it" show student growth in this area. In fact, for some, the practice of recording promoted self-confidence, with one student sharing, "This experience expanded my own horizons; before, I was not very comfortable with recording videos of myself. I am still not, however, Flip was a step in the door to being more accepting of myself oddly enough." Last, it is noteworthy to share that only one student reported on the survey a preference for text-based discussion over the video-based format.

Implications

Video-based discussions may be one way to promote quality interactions and contribute to developing a sense of community and belonging in the absence of face-to-face classes. An increased social presence is particularly relevant when attempting to create a sense of community and belonging. In our courses, survey data indicated that Flip is a promising tool for facilitating video-based discussions and establishing a social presence, which aligns with previously identified benefits (Lowenthal &

Moore, 2020). The features of Flip allow for active student engagement and reflection on learning. However, instructors must consider students' challenges with using this tool and plan to address these. Strategies such as setting clear expectations for posting videos and modeling authentic over infallible video posts encourage genuine reflection and humanize the online space. In addition, instructors can change up the use of Flip and adapt tasks as relevant. Varied uses might include topic debates, exit tickets, activating prior knowledge, creating screencasts using Flip's recording features, or small-group cooperative learning tasks. Flip can additionally be used in nonacademic ways to build community. Students might introduce a friend, share what they are reading, complete a challenge, solve a riddle, or share pet photos. We found that pet photos are always a win!

Instructors wishing to use video-based discussion should view Flip as an opportunity to foster student connections and develop a sense of belonging in the online classroom. Flip provides students a platform with which to engage with peers, build confidence, and share their voice, or in one student's words, "Online classes can be really boring and isolating, but this offers a more genuine expression of self and is a *great way to connect*."

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A Critique of the Commonly Used Approach to Study the Effectiveness of Technological Interventions for Raising Students' Sense of Belonging

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Abstract: In this article, the authors critique the common approach used to study the effectiveness of technological interventions for raising students' sense of belonging. Two studies are reviewed, one used Facebook groups and the other used a makerspace. Both studies primarily failed to include any variable that measures the extent of student involvement in the use of the applied technology. Future research could be extended to overcome this drawback and/or to provide students with an active role, if possible, in designing part of the intervention.

Keywords: sense of belonging, Facebook group, makerspace, t test, use of technology

College efforts using psychological interventions to raise students' sense of belonging have been found to improve not only (minority) students' academic performance but also their well-being and health condition over three years (Walton & Cohen, 2011). Given these findings, the effectiveness of various interventions (e.g., psychological interventions (Walton & Cohen, 2011), social-emotional interventions (Costello et al., 2022), curricular interventions (Harben & Bix, 2020; Mendoza & Venables, 2023; Stoddard, 2022), ecological interventions (Burk & Pearson, 2022), and technological interventions (Andrews et al., 2021; Sheeran & Cummings, 2018), that could impact students' sense of belonging is worth investigating.

Prior studies on technological interventions' effectiveness have primarily used the snapshot approach, which involves comparing a treatment group with a control group (e.g., in Sheeran and Cummings (2018)) or comparing the pre- and post-intervention conditions of the same sample (e.g., in Andrews et al. (2021)). The effectiveness is then interpreted from the mean value of the measured variable(s) obtained from across groups by survey or between pre- and post-surveys conducted on the same sample at the designated level of statistical significance. But this approach has two major drawbacks.

First, how much effort the students put into an intervention is entirely or at least partially ignored. At the same time, the corresponding effectiveness associated with different levels of student effort cannot be investigated. The effort invested by different student populations (e.g., sorted by gender, race, year in their study program, etc.) can vary. It would be helpful to build a measure of their effort in the interventions and associate this with a measure of their sense of belonging. Second, the interventions investigated have often been passively imposed on the students, for instance, by attaching a Facebook group to a course (Sheeran & Cummings, 2018) or requiring/strongly encouraging students to visit a makerspace (a collaborative workspace) to complete course assignments (Andrews et al., 2021).

An individual's creation of a sense of belonging to a system/environment calls for his/her experience of personal involvement in that system/environment (Hagerty et al., 1992). Opportunities

for interaction, among other factors, can also play a role in sense of belonging development in the individual (Ma, 2003; Winter-Collins & McDaniel, 2000). Leach (2005) assembled related views from earlier literature, including Butler (1993), Fortier (1999), and Riger and Lavrakas (1981), provided evidence that people develop a sense of belonging to a place/space (e.g., a neighborhood) via their active and passive participation, in addition to forming social networks and social interactions. Young et al. (2004) confirmed that interaction and participation are two of the factors affecting an individual's complex psychological and physical understanding and interpretation of a neighborhood, which are critical for his/her formation of a sense of belonging in that environment.

These findings also have relevance to the academic environment. Meeuwisse et al. (2010) found a positive relationship between an active learning environment, peer and teacher interactions, and students' sense of belonging. We believe students' sense of belonging would substantially increase if they were allowed to participate in designing the interventions meant to enhance it (which is a relatively higher level of interaction and active participation, compared with interventions without this designing component).

In this article, we review two recent exemplary studies, in which a technological intervention has been used to enhance student outcomes (e.g., connectedness, engagement, self-efficacy, and sense of belonging), although we limit our critique to an exploration of the interventions' effects on sense of belonging. Sheeran and Cummings (2018) explored whether attaching a Facebook group to a course increased students' sense of belonging. On the other hand, Andrews et al. (2021) studied whether requiring or strongly encouraging students to use a makerspace to complete their course assignments helped increase the students' sense of belonging to the makerspace and to the community of their specific field of study on their campus. We compare the two studies focusing on their strengths and weaknesses (see Table 1) and provide recommendations for future studies.

Table 1. Summary of the Two Articles Reviewed in this Critique, with Respect to Students' Sense of Belonging.

Criterion	Sheeran and Cummings (2018)	Andrews et al. (2021)
Definition of sense of belonging	The authors did not define sense of belonging.	"An individual's self-perception of fit" (p. 2)
Intervention	Use Facebook groups (and associated social media sites) to support the delivery of course information, formal and informal discussions, and reminder of deadlines	Assign a makerspace-based project in engineering courses
Study sample	$N = 471$ students at a large, Australian university	$N = 213$ undergraduate engineering students at a public university in the southwestern United States
Study year	Not given	Fall 2018 to Spring 2019
Research question	Do courses with an attached Facebook group increase students' sense of belonging compared to courses without Facebook groups?	Does the use of a university makerspace in engineering course projects impact student's sense of belonging in the engineering space, among other factors?
Methodology	T tests for between-subjects analysis of differences in students' sense of belonging between students who had a course with a Facebook group (official and unofficial) and students who did not.	Paired t tests on matched responses from pre-intervention and post-intervention surveys and repeated measures analyses of variance on subsamples of students by year in their program, gender, and race.

Criterion	Sheeran and Cummings (2018)	Andrews et al. (2021)
Findings	Students with either an official or unofficial Facebook group attached to at least one of their courses demonstrated an increased sense of belonging. A second analysis compared students taking a course with only an official Facebook group to those enrolled in a course with no Facebook group attached and, again, found an increased sense of belonging.	Students who visited the [university's makerspace] facility showed significant gains in a sense of belonging to the makerspace and to the engineering community. Only 2nd-year (1st-year) students felt a statistically significantly higher sense of belonging to the engineering community (the makerspace) over a semester. Gender did not significantly impact students' sense of belonging; some races (White, Asian, and Hispanic/Latinx) demonstrated statistically significant gains in students' sense of belonging to the makerspace.
Discussion	A course with a Facebook group, either official or unofficial, attached to it increased campus engagement attributes (including students' sense of belonging). These findings are consistent with those of Barczyk and Duncan (2013), Hung and Yuen (2010), Hurt et al. (2012), Kabilan et al. (2010), and McCarthy (2010).	Findings on the sense of belonging agree with those of Good et al. (2012), Hausmann et al. (2007), Rainey et al. (2018), Seymour and Hewitt (1997), and Tate and Linn (2005). Results suggest that requiring students to visit the makerspace as part of an assignment/course may (1) reduce student hesitation about the space (so that they are more likely to return) and (2) help engineering students make the space more inclusive and ensure that more students are receiving the space's benefits.
Conclusion	The results of this study indicate that Facebook groups may be a useful addition to university courses.	The research results have reaffirmed the value of including a makerspace in students' early educational experiences.
Stated research shortcomings	Causality could not be inferred, and effect sizes were small in the study results. There was little consistency in or measurement of how the Facebook group was used and no indication of student–staff interaction, which could have moderated the effect. The investigation was limited to the existence of Facebook groups in the courses only, with no control for potential individual-level variables.	Examination of causality was impossible, and student's engagement with the makerspace, in terms of time and effort spent, was not tracked to study its impact on student's sense of belonging.
Stated limitations and recommendations for future research	A high proportion of unofficial Facebook course groups was found, but further research into these courses was determined to be beyond the scope of this study. There is a potential to expand this study to look at moderating student-level variables such as personality or academic motivation. Future studies	This study investigated one makerspace at one institution in only eight courses with few instructors included. As such, generalization is limited. Variables that might have had an influence on results (e.g., other coursework, interactions with makerspace staff, number of visits) were not captured. In the future, researchers

Criterion	Sheeran and Cummings (2018)	Andrews et al. (2021)
	could also control for instructors' teaching approach and communication style.	should investigate the generalizability of the findings of this study across other STEM disciplines and makerspace contexts. As students' belief in feeling a higher sense of belonging to the engineering community might vary over their undergraduate years, examining how this happens should also be a future research direction.

Note. STEM = Science, technology, engineering, and mathematics.

Facebook Group

The purpose of Sheeran and Cummings (2018) was to investigate whether attaching a Facebook group to a course was associated with increased students' sense of belonging. More specifically, the authors hypothesized that courses with a Facebook group (either official or unofficial) would be associated with an increase in students' sense of belonging compared to courses with no Facebook group.

On the social media platform Facebook, groups are a virtual place where users can engage and share information, stories, and media with other people. Numerous types of Facebook groups exist, with topics ranging from home baking to dating etc. These groups can be listed as public or private, and each may have a unique set of rules and parameters for user participation (Meta, n.d.).

In Sheeran and Cummings (2018), official Facebook groups were created by instructors, and all students enrolled in the courses were invited to join them. Unofficial Facebook groups could be created by instructors or by any student in the class. There was no expectation that all students would be invited to an unofficial Facebook group or that they were aware that one existed during their time registered in the class.

Participants in the study were recruited from a large, Australian university with approximately 46,000 students. Students voluntarily participated in this experiment in exchange for partial course credit in an introductory psychology course. The study was also mentioned in a university-wide email sent to all students asking for volunteers for the research project. The authors used eight items to measure students' sense of belonging. Each item was tested for internal consistency and rated on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The online survey was given on Qualtrics, and students were asked how many courses they had completed/were completing that semester and whether the courses had a Facebook group. To reduce participant burden, a maximum of two courses were selected for each participant (one course with an official Facebook group and one without).

Sheeran and Cummings (2018) noted increased interest in studying the use of social media sites as an educational tool in an academic setting, such as in Aydin (2012), Manca and Ranieri (2016), Piotrowski (2015), and Tess (2013). Following suit, they investigated the effect of Facebook groups as a course-specific resource over many different courses on student engagement categories, including students' sense of belonging. However, they did not control for or measure teaching-specific approaches or interventions of the Facebook groups. Sheeran and Cummings anticipated large variances in usage, engagement, and effectiveness of the Facebook group due to the broadness of their study.

Students with either an official or an unofficial Facebook group attached to at least one of their courses had an increased sense of belonging compared to students in courses with no Facebook group attached. Further, students with only an official (no unofficial Facebook group in any course)

Facebook group attached to a course compared to students with no Facebook groups attached to any course also showed an increase in the sense of belonging. The authors concluded that Facebook groups may be a useful addition to university courses in raising students' sense of belonging. This study provides further confirmation that supports the use of technology in the classroom as a resource to increase students' sense of belonging. It is the first study to specifically investigate the effect of using Facebook on student engagement, including sense of belonging, in the classroom across a broad range of courses. Although this study focused on Facebook, there is potential that the value of this technology may be generalized to other technologies in the classroom to increase students' sense of belonging.

The study was not without shortcomings. First, the authors could not infer causality based on the design of their study. They also noted that the effect sizes throughout the study were small. This may have been caused by including participants without measuring their Facebook group interaction. If students had low interaction levels, it could have dampened the captured effect size. The authors did not control or measure how Facebook groups were used in the courses, and there was no indication of student–staff interaction. This study simply associated a Facebook group in a course with increased students' sense of belonging on campus. It did not control for potential student-level variables either, which may have had a moderating effect on some of the findings.

The authors noted a surprising finding that there was a high proportion of unofficial Facebook groups associated with courses, but an investigation into these groups was beyond the scope of their study. Given that Sheeran and Cummings found differences in students' sense of belonging depending on whether the Facebook groups were official or unofficial, these authors recommended that future research should extend their investigation to include a more in-depth look at unofficial Facebook groups. Another recommended area of future research was to investigate the moderating effects of individual-level variables such as student personality or academic motivation. Future research could also control for instructors' teaching approach, communication style, and early indications of students' degree identity.

University Makerspace

Andrews et al. (2021) explored the use of a makerspace-based project in engineering courses. Students were either required to visit the space or strongly encouraged to do so. In either case, students could choose whether to visit the makerspace or not.

A makerspace is broadly defined as a facility that “enables making.” These spaces can provide access to cutting-edge technology and a variety of traditional hand tools (Andrews et al., 2021). Different spaces might require different equipment and layouts of facilities (Barrett et al., 2015; Dougherty, 2012). In Andrews et al. (2021), the makerspace was referred to as “The Invention Space,” a 23,000+ square-foot two-floor centerpiece facility of the largest engineering building on campus. Most of the square footage was used as a digital fabrication lab and as space for open worktables for use by students. From there, students could access engineering-related equipment (e.g., various 3D printers and full-spectrum laser cutters, etc.) and various relevant handheld tools (e.g., manual mills and lathes). The makerspace was open to engineering students (undergraduate and graduate) and faculty. Students visited the makerspace for reasons such as (1) to work collaboratively with classmates, (2) to tinker with personal projects, or (3) to meet with their extracurricular organizations.

Six hundred and ten students agreed to participate in the study. However, only 213 responded to both the pre-intervention and post-intervention surveys in the same semester without omitting data on one or more of the nine study factors, including their sense of belonging. The study took place in eight undergraduate engineering courses across five disciplines from fall 2018 to spring 2019 at a southwestern public university in the United States with an undergraduate engineering enrollment of

about 6,000 students. Two of the courses were interdisciplinary. Five of the courses were lower division, three upper division. Their distribution by year in the program was four 1st-year courses, two 3rd-year courses, one 4th-year course, and one multilevel course. Half of the courses were required and the other four were electives.

The study examined how the use of a university makerspace (“The Invention Space,” in this study) in engineering course projects impacted students’ sense of belonging (or an individual’s self-perceptions of fit) within the engineering space, among other factors. See Table 1 for the primary research question.

The study applied paired *t* tests on matched responses [i.e., repeated measures by pre-intervention (during the 1st week of class) and post-intervention (during the last week of class) surveys (with a Bonferroni correction for multiple correlations). Repeated measures analyses of variance were also conducted on subsamples of students by year in program, gender, and race. The surveys each took 15 min to complete and included Likert-type, multiple-choice, and open-ended questions about students’ sense of belonging and other factors. As the surveys were taken during class time, students were not incentivized to complete them.

The following findings were obtained from the students who provided complete data for analysis. Like in Cohen (2013), students who visited the university makerspace facility had significant gains in six of the nine measures, including a sense of belonging to the makerspace and the engineering community on campus. These findings agree with those of Good et al. (2012), Hausmann et al. (2007), Rainey et al. (2018), Seymour and Hewitt (1997), and Tate and Linn (2005). Of the students who did visit the makerspace, the results for the subsamples by year in program, gender, and race were as follows: (1) only 2nd-year students felt a statistically significantly higher sense of belonging to the engineering community on campus; (2) only 1st-year students experienced a statistically significant gain in the sense of belonging to the makerspace over a semester; (3) gender did not demonstrate an incremental impact on either type of sense of belonging; and (4) White, Asian, and Hispanic/Latinx students demonstrated statistically significant gains in the sense of belonging to the makerspace.

These findings suggest that requiring students to visit the makerspace as part of an assignment or course might (1) reduce student hesitation about using the space (so that they would be more likely to return) and (2) help engineering students make the space more inclusive and ensure that more students were receiving the space’s benefits. The research results also reaffirmed the value of including a makerspace in students’ early educational experiences. On the other hand, the authors concluded that more attention needed to be paid to prevent the creation of further disparities in engineering education for female students and racial minorities.

The matched responses from the pre-intervention and post-intervention surveys did not allow causality to be examined. Students were asked to use a general-purpose makerspace that was open to them and their peers from all engineering fields and levels of undergraduate courses. Students just visited there on their own and at their preferred time. Unless a prior arrangement was made, they might not have been able to meet the people they intended to meet or use the equipment/technology they intended to use. This could have lowered their sense of belonging.

As only one makerspace at one institution was examined, associated with just eight courses and a few instructors, there was minimal generalization of the research. The study did not capture other variables (e.g., those for other coursework, interactions with makerspace staff, number of visits) that might have contributed to the results. The authors indicated that future work should examine the generalizability of the findings of this study across other science, technology, engineering, and mathematics disciplines and makerspace contexts. In addition, as students’ belief in feeling a higher sense of belonging to the engineering community might vary over their undergraduate years, examining how this happens should also be a future research direction.

Strengths and Weaknesses of the Studies

The assumptions made in the two studies and their strengths and weaknesses are summarized in Table 2. Both Sheeran and Cummings (2018) and Andrews et al. (2021) shed light on a relevant topic in today's current teaching environment, and both studies examined the effectiveness of using technology to raise students' sense of belonging, an especially pertinent subject given the increased use of technology in education during the COVID-19 pandemic and after.

Little research has been conducted on using Facebook groups as a resource in the classroom and their impact on students' sense of belonging. Sheeran and Cummings (2018) made several assumptions in the study. First, the authors assumed that all students interacted with the course-associated Facebook groups in similar amounts and ways. Although there were over 400 participants surveyed in various classes, it was assumed that the Facebook groups, either official or unofficial, were employed in consistent ways in the classroom. The authors noted that the examination of unofficial course-attached Facebook groups was outside the scope of their study; however, when discussed, the assumption appeared to be that if an unofficial Facebook group existed, the students were all aware of and able to access the group. Finally, there was no information regarding how these Facebook groups were used in the classes and whether participation was required and assigned or completely voluntary. These assumptions and the varying uses of the Facebook groups in the classes may have caused a dampening of the overall effect.

A strength of this study is that the scales used were appropriately tested for validity, and the findings of this study were impactful for teachers in higher education. However, a more thorough literature review would have better supported the theoretical background of this paper. The authors also did not control for demographics in their study or several other student-level (motivation, self-efficacy, etc.) or faculty-level (communication style, approachability, etc.) factors.

Table 2. Assumptions, Strengths, and Weaknesses of the Two Reviewed Studies in this Critique.

Criterion	Sheeran and Cummings (2018)	Andrews et al. (2021)
Assumptions	- Facebook groups were used in the same manner from course to course, and students interacted in equal amounts. - Students were aware of unofficial Facebook pages when available.	All students who visited the makerspace had the same exposure and demonstrated the same extent of engagement.
Strengths	- Validity of scales was tested for internal consistency. - First known study on using Facebook in the classroom to increase students' sense of belonging. - Broadness of study—the results may be generalizable to a variety of classes, student levels, and faculty. - Impactful findings regarding students' sense of belonging and use of social media.	- An appropriate literature review on the sense of belonging was provided. - Two data points for each observation allowed for studying growth in the sense of belonging. - A list of items for each factor (or construct) was clearly provided in the Appendix. - Students' sense of belonging was measured using a previously validated scale.

Criterion	Sheeran and Cummings (2018)	Andrews et al. (2021)
		• The authors also validated their modified constructs.
Weaknesses	• Intervention was not consistently applied to the students. • Participants' interaction with the Facebook groups was not measured. • Lacked sound literature review and variable definitions, including the sense of belonging variable. • Did not control for demographics or other external factors that may have influenced findings, such as student motivation or faculty approachability.	• Intervention was passively imposed on the students. • Students' extent of engagement in the makerspace was not tracked.

Using a similar set of implicit assumptions to those in Sheeran and Cummings (2018), that the intervention was applied equally across all classes and that students engaged with the intervention in equal amounts (see Table 2), Andrews et al. (2021) studied the impact of makerspace usage on students' sense of belonging. An appropriate literature review on the sense of belonging was included in the article. Two data points for each observation in the study sample allowed for studying growth in the sense of belonging. A list of items for each factor (or construct), including three items specific to belonging to the makerspace (The Invention Space) and another three items specific to belonging to the engineering community on campus, were provided in the Appendix. Students' sense of belonging was measured using a previously validated scale (as in Hurtado and Carter (1997)), with adjustment to the specific intervention and target sample in this study. This enabled an objective comparison of results across studies. The modified constructs were also validated by the authors using explanatory factor analysis, which provided evidence that all three items in the individual constructs loaded onto the same factor. A follow-up confirmatory factor analysis for the six items also illustrated that a two-factor solution was a good fit.

However, the intervention was passively imposed on students. Moreover, both the pre-intervention and the post-intervention surveys asked students whether they had visited the makerspace, but not how often or for how long on each visit. Thus, students' extent of engagement in the makerspace was not tracked, which could be a significant factor in their sense of belonging.

Conclusion and Future Studies

Although both studies succeeded in providing evidence that supports the use of technology in raising students' sense of belonging, further insights cannot be made without fine-tuning the research methods and/or extending the studies to include more measure variables (see Table 3).

Sheeran and Cummings (2018) could be extended in various ways. Future studies could examine student-level (e.g., motivation, confidence, self-efficacy) and faculty-level (e.g., approachability, communication style) moderating variables that might influence the relationship

between the Facebook group and students' sense of belonging. Investigating the differences between official and unofficial Facebook groups and their resulting impact on students' sense of belonging would also help advance the existing literature frontier. Future researchers could also consider ways to examine the causality between these two individual variables and students' sense of belonging. For instance, do students with a higher sense of belonging drive interaction in course-attached unofficial Facebook groups, or do unofficial Facebook groups help reinforce students' sense of belonging? A measure of student interaction could also be added in future studies that would capture the amount of time and the ways a student interacts with the technology.

Table 3. Recommendation for Related Research in the Future.

Criterion	Sheeran & Cummings (2018)	Andrews et al. (2021)
Recommendations for future research	• Include moderating variables at both the student-level and faculty-level • Further examine the effect on the sense of belonging between courses with an official versus an unofficial Facebook group. • Include a construct to measure Facebook group interaction.	• Include some assignment-related activities to be held at the makerspace in the intervention. • Create a construct to track students' engagement with the makerspace.

For studies like Andrews et al. (2021) in the future, researchers could consider enhancing the intervention by including some assignment-related activities, such as a presentation or demonstration of students' work and/or small group or panel discussions related to the topic of the individual assignments, to be held at the makerspace. This would give students a chance to design at least part of the invention process and make their participation more active, and it would also help them establish connections with makerspace users who have the same or similar interests as theirs. As we mentioned in the Introduction section, such an intervention would involve a higher level of student interaction and active participation, which would help raise students' sense of belonging. The extent of students' engagement in the makerspace could positively affect their sense of belonging to the space and to the engineering community. Incorporating a construct to track students' engagement with the makerspace by including items that question how often students go to the makerspace and how much time they spend there would help readers interpret the research findings.

Whereas psychological interventions aim to change the mindset of students (Walton & Cohen, 2011), technological interventions improve their existing environment (Andrews et al., 2021; Sheeran & Cummings, 2018). Students might hardly feel the impact of technological interventions or enjoy the benefits once they no longer have access to the class environment. Following students to track the long-term impact of those interventions would not be expected to produce meaningful findings.

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Forging Connections and Fostering Belonging: The Role of Positive Psychology in the Virtual Classroom

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Abstract: Technology has expanded the landscape of higher education. The ability to learn almost anything from anywhere at any time has impacted educational attainment, particularly for those who lacked access in the past. Many who enter the virtual classroom, however, do not stay. Completion rates for online learning fall short, especially when compared to in-person experiences. For all its advancements, online learning has also created a chasm in human connection that influences learning. We are not made to connect through wires. Though we may espouse having multitudes of “friends” online, developing a true sense of belonging and connection must be purposefully developed when working through a screen and keyboard. This reflective essay interrogates the use of technology in higher education and encourages the inclusion of positive psychology practices to bridge the gap of human connection that is an integral part of student success.

Keywords: virtual connection, belonging online, positive psychology, positive introductions, motor synchrony

Some of my closest friends from school are people I've never met in person. Thanks to modern technology, I was able to earn a Master's degree in Applied Positive Psychology (MAPP) from the comfort of my dining room table. Due to the challenges brought by Covid-19, the University of Pennsylvania transitioned its MAPP program to a virtual classroom for a period of two and a half years. Like many adult learners, I'm not sure if I could have successfully completed the program without the online format, especially during the pandemic. Beyond the academic achievement, this virtual experience allowed me to build meaningful connections with people from all across the nation and the world. It was a unique and enriching aspect of my educational journey that I had never encountered in a traditional classroom setting.

This occurrence was not coincidental, and it was particularly fitting that the field of study was positive psychology. Positive psychology is the empirical investigation of human flourishing and the optimal functioning of individuals, groups, and institutions (Gable & Haidt, 2005). Martin Seligman, the pioneer of contemporary positive psychology (2011), recognized, and it is supported by extensive data, that positive relationships are integral for our overall well-being and growth. The concepts of belonging, significance, and purpose stand as pillars in the realm of positive psychology, significantly influencing our performance and well-being.

Technology and Education: The Double-Edged Sword

The enrollment of postsecondary students in at least one online course has significantly increased over the years, rising from 5.9 percent in 2000 to 32.1 percent in 2012 (Ortagus, 2017). Colleges and universities have witnessed the most substantial growth in their online classes and programs (Sener, 2012). Even before the onset of the pandemic, institutions of higher education in the United States were experiencing a clear trend of greater enrollment in online courses and degree programs (Shankar et al., 2021). Although higher education institutions returned to face-to-face instruction in Spring 2022, in-person classrooms still fell below pre-pandemic 2019 levels (Bay View Analytics, 2022).

However, the impact of online learning on completion rates is a mixed bag. Completing some online courses as part of a degree program has shown lower odds of dropping out of college (Ortagus, 2018). On the other hand, taking all distance learning classes increases the probability of not completing a degree (Ortagus, n.d.). Moreover, students who enroll exclusively in online courses were found to be 15.8 percent less likely to complete their associate's degree (Ortagus, n.d.), with these rates of non-completion being even higher for Black, Hispanic, and low-income students. A U.S. News and World Report, which describes an average retention rate of 55 percent for first-time full-time students online compared to 77 percent of students at traditional universities, highlights this discrepancy (Burnsed, 2010). In general, retention rates for in-person courses have been 10 to 20 percent higher than those for online courses.

Studies have shown that community college students who enrolled in a higher proportion of online courses were less likely to complete their degree or transfer to a 4-year institution, were less likely to stay in an online class in college-level math and English (Xu & Jaggars, 2011), received lower grades, and withdrew from online classes compared to students who attended face-to-face courses (Xu & Jaggars, 2013). The decline in academic performance when attending online compared to in-person classes was most pronounced among African-American students, male students, and those enrolled in social science courses (Xu & Jaggars, 2014).

In the context of COVID-19, Tang et al. (2023) studied the impact of transitioning to online learning for first-year college students. They found that although learning outcomes were not greatly affected, the sense of belonging, crucial for their experience and well-being, was lacking. The loss of this sense of belonging was a significant setback for both students and teachers, as it would have naturally developed in face-to-face classrooms (Heider, 2021). Feelings of isolation have been identified as one of the most substantial barriers to distance learning and a key reason for students dropping out (Croft et al., 2010). Since the shift to online classes due to COVID-19, students have reported experiencing feelings of loneliness, isolation, psychological distance, and disconnection from peers and educational institutions (Arslan, 2021). This lack of connection places students at great risk of academic failure or withdrawal. Additionally, the absence of connection and belonging has led to increased mental health issues, heightened anxiety regarding academic performance, and reduced academic self-efficacy in students (Alemany-Arrebola et al., 2020; Sahu, 2020).

Research conducted by Jean Twenge (2017) indicates that the generation of students currently in high school and college, often referred to as *Gen Zs* or *iGens*, is particularly affected by the consequences of technology and a lack of in-person connections. These students engage in face-to-face socialization activities half as often as those from 15 years ago, spending less time interacting in person and more time online. This generation also experiences unprecedented levels of anxiety, depression, and loneliness, coinciding with the rise of smartphones and social media. Real-life interactions have been increasingly replaced by online interactions, and while not all the changes can be attributed to technology, it seems that these digital natives may be paying the price for an online existence in terms of their sense of connection.

Positive Psychology and Connection

In 2004, Shapiro and Wilson independently cautioned that overreliance on technology could potentially hinder children's development of one-on-one interaction skills and asserted that distance learning could never fully replicate the depth of education achieved in person. Today, we find ourselves at a point of no return, and with technology firmly entrenched in our educational landscape, it is undeniable that our education system has been permanently transformed by this technological revolution, presenting both benefits and challenges.

Research has shown that students who establish a strong sense of belonging in online courses tend to exhibit superior academic performance, greater retention in their chosen field of study, and heightened enjoyment coupled with reduced anxiety (Brodie & Osowska, 2021; Edwards et al., 2022). Conversely, feelings of alienation in online classrooms can negatively impact knowledge sharing intention, the quality of assistance provided, and the level of social support (Liu & Zhang, 2020; Jeng et al., 2023). In light of these findings, it is clear that we need to harness technology's potential to foster connections among students in the virtual classroom. Positive psychology emerges as a potential solution to this challenge.

Educators, guided by positive psychology, should prioritize building connections in classrooms, whether in-person or virtual. While virtual settings present unique challenges, technology can assist in this process. Profound connections often form when we're physically present, enabling affective empathy by eye contact (Ashar et al., 2021), and social touch which also enhances connection (Löken et al., 2009). Despite limitations in virtual touch, positive psychology offers alternative approaches for fostering connections and well-being across distances.

Establishing virtual connections demands dedicated time and effort, a challenge educators often face due to syllabus constraints. Nevertheless, considering the profound impact of a sense of belonging on learning outcomes, investing this time can result in improved content retention among students. Importantly, our brains are inherently wired for social interaction, even with unfamiliar individuals (Rilling et al., 2002). Educators possess the capacity to nurture this social inclination, even in virtual environments. The MAPP program effectively implemented the following strategies, markedly enhancing students' sense of belonging and connection.

Positive Introductions

In many online courses, the initial assignment involves introductions which typically entails sharing details about our background, major, accomplishments, and reasons for taking the class. While not inherently problematic, this common practice does not always allow others to truly understand who we are. Extensive research underscores the importance of feeling valued and deeply understood by others (Dixon, 2007; Fredrickson, 2013; Prilleltensky & Prilleltensky, 2021). Any opportunity for students to be genuinely known by their peers can significantly enhance their sense of connection and belonging.

An alternative to the standard introduction is a positive psychology approach known as "positive introductions." Here, students are encouraged to share personal stories that highlight their strengths and values, showcasing themselves at their best (Park & Peterson, 2009). They are also taught to respond with active constructive feedback (Gable et al., 2004) and cognitive and emotional acknowledgments to foster connection and mutual respect. After instructions are given for both the introductions required and the feedback that will occur, students are sent into virtual break-out rooms in groups of three to four and given time to participate in their positive introductions. All cameras must be on for this activity. Positive introductions promote vulnerability, often leading to deeper connections (Aron et al., 1997). Participating in this exercise at the beginning of the MAPP program, I experienced an immediate sense of connection, trust, and support from three fellow students with whom I voluntarily collaborated throughout the year. When we finally met in person at graduation, seeing them felt like reuniting with lifelong friends.

Collaborative Assignments

Prilleltensky and Prilleltensky (2021) underscore the significance of feeling valued and recognizing the impact of our actions (Elliott, 2009; Flett, 2018; Rosenberg & McCullough, 1981). Mattering holds

universal importance, irrespective of age, and it is notably challenging to establish a sense of mattering in an online context. The feeling of not mattering often arises when students perceive that the class continues without their presence, whether online or offline. To enhance this sense of mattering and belonging, collaborative assignments are invaluable (Hehir et al., 2021; Stoytcheva, 2021). True mattering and belonging are most keenly felt when students recognize their importance within a team striving toward a common objective. Offering opportunities for collaborative work and projects significantly enhances a student's sense of belonging. These opportunities may include time given during class for small teams to meet in virtual classrooms or requiring outside classroom time for teams to meet online. These online collaborations often allow for individuals to get to know each other personally as well as prepare for assignments. Knowing that their contributions were instrumental to a team's success reinforces their sense of mattering and impact.

Initially, I had reservations about the MAPP program's requirement for collaborative work. Group projects have never been my preferred choice, and having to do it by distance seemed even less exciting. However, within this program, I discovered that these projects not only facilitated academic collaboration but also fostered a stronger sense of connection and community. Working on assignments through a screen with others allowed me to interact with various individuals outside of our regular class meetings, enabling me to get to know them and be known by them. Like a traditional group meeting, seeing each other on screen, we could see each other laugh at a silly joke, furrowed brows when confused, and even tears when our teammate shared a personal loss. Seeing, listening, and speaking to each other via online platforms allowed us to feel that we belonged to the team, which made us more optimistic and creative (Murthy, 2020) with our projects and it showed during our online classroom presentations.

Providing students with opportunities to collaborate on projects, assignments, and participate in study groups through online, synchronous working groups, and not just online chats, not only enhances their sense of mattering but also fosters a strong sense of community (Stoytcheva, 2021). Truly belonging to an online community assures students that their absence will be noticed, that they belong, and reinforces a deeper connection between students. While remote learning students often experience a reduced sense of community (Kuong, 2015), digital interventions can mitigate this challenge.

Heider (2021) recommends real-time meetings whenever possible, the implementation of collaborative learning techniques, the development of subcommunities within the larger group, and the creation of opportunities for students to share information and their expertise. All of this can be done virtually and with some advanced platforms like Google Meet, Zoom and Microsoft Teams, it can almost feel like the face on the screen is in the room with us. The prompt use of technology, encompassing emails and text-based communication, can significantly enhance an individual's feelings of belonging, mattering, and connection with both peers and instructors (van Tryon, 2007; Wheeler, 2007). Virtual platforms now allow for instantaneous responses with emojis, chats, and physical responses like raising hands or thumbs up on the screen. Building online communities may present challenges, but with deliberate interventions, virtual classrooms can evolve into close-knit communities where individuals feel valued, seen, connected, and engaged.

Motor Synchrony

As John Donne (1624) wisely proclaimed, "No man is an island," and this sentiment resonates profoundly in the realm of online education. Cultivating a sense of community within virtual classrooms not only fosters connection, collaboration, emotional support, and satisfaction but also significantly enhances student retention (Bireda, 2019; Jamison & Bolliger, 2020; Lambrinidis, 2014; Zhao, 2003).

Another effective approach for creating a robust learning community is through synchronous virtual classes or a hybrid model that combines virtual and in-person elements when possible (Hehir et al., 2021). This synchronous online engagement enables individuals to see each other, fostering interbrain and interpersonal synchrony, which in turn heightens the sense of connection and community (Djalvoski et al., 2021; Rennung & Göritz, 2016). Synchrony is a social tendency that enables humans to harmonize their biological and behavioral rhythms, essential for fostering healthy development, bonding, connection, and a profound sense of belonging. Moreover, synchrony enhances our "theory of mind," our capacity to empathize and understand others (Baimel et al., 2015).

In online classes, achieving synchrony is attainable when students can see each other, cameras on. However, the efficacy of maintaining cameras on throughout online interactions is subject to mixed data. A 2021 Harvard Review describes "Zoom fatigue," a phenomenon resulting from the exhaustion of viewing oneself during virtual meetings and classes (Gabriel et al., 2021). While having cameras on can alleviate the sense of isolation and enhance motor and interbrain synchrony, it is not as straightforward as it may seem. Merely having cameras on or sharing the same digital space does not guarantee community development. Intentional practices, such as engaging in conversation, participating in chat discussions, rhythmic activities like tapping to music, dancing, and coordinated movements such as marching or raising and lowering hands, can significantly magnify the benefits of interactional synchrony (Hoehl et al., 2021). In the MAPP program, we engaged in various shared activities, including dancing, singing, practicing yoga, sharing meals, and even enjoying movie nights, all within the virtual realm. Despite being physically distant, these experiences made it feel as though we were all in the same room, sharing the profound human connection and a lot of laughter.

Educators can leverage the innate human inclination to move together, akin to a flock, a herd, or a hive. Haidt's *hive theory* (Haidt et. al., 2008) posits that humans thrive through cooperation and diminished intergroup competition when they occasionally immerse themselves in becoming part of an emergent social organism, ultimately reaching the highest levels of human flourishing. Was it awkward to dance in front of a screen in my dining room? Absolutely! But the feeling of belonging to a community of other awkward people who cared about me more than my dancing skills is priceless.

Instructor Influence

When it comes to fostering connection in online learning environments, the instructor plays a pivotal role. Teacher interactions that involve being available, professional, engaged, and approachable (Mandernach et al., 2018; Martin et al., 2018; Stone & Springer, 2019) significantly enhance the sense of connectedness within the classroom. Regular and meaningful communication with students increases their feeling of connection (Stone & Springer, 2019), and positive student-teacher relationships are correlated with increased student-student connectedness (Bireda, 2019; Stone & Logan, 2018). Simply using a student's name when calling on them, noticing something that has changed with them such as a haircut or background scenery change, or just smiling while saying hello during a synchronous class can increase the sense of belonging, mattering, and connection.

Teacher presence is closely associated with connectedness in online learning environments. Whether it is seeing a teacher's face or hearing personalized audio lectures, even in asynchronous classes, it has a positive impact on connectedness, satisfaction, and engagement in remote learning (Mandernach et al., 2018;). Active teaching, discussions, office hours, and prompt responses to online communication and posts are preferred by students over passive teaching (Jamison & Bolliger, 2020). In fact, Stone and Springer (2019) assert that teacher presence is as vital as the course content itself in remote learning when it comes to student connectedness.

These positive teacher presence and interactions align with the concept of "positivity resonance" from Barbara Fredrickson (2013). This term encapsulates "interpersonal connections

characterized by positivity, mutual care, concern, and behavioral and biological synchrony” (Major et al., 2018, p. 1631). Positivity resonance signifies moments of connection that don't necessarily require extensive or intensive time periods. These moments of pleasant subjective experiences shared between individuals accumulate over time and significantly impact health and well-being (Fredrickson, 2016). This collection of resonant moments can happen through virtual connections.

Real-time sensory connection is a vital element of positivity resonance. According to this theory, instructors should seek to optimize moments of live eye contact through the camera, synchronize facial expressions and body movements, reciprocate emotional expressions, and share laughter (Fredrickson, 2016; Lakin et al., 2003; Kurtz & Algoe, 2015). While asynchronous classes present a challenge, they still offer opportunities for intentional connections.

In the MAPP program, every instructor and teaching assistant exemplified these best practices derived from research. They didn't merely lecture; instead, they actively engaged with us, fostering an environment where we collectively experienced joy, laughter, tears, and sorrows. It was not a one-way street where they were the lecturers and we were passive vessels to be filled. Instead, their lessons reached through the computer to invite me into the connection needed to become part of the class and engage in the learning. We learned together, and most importantly, we forged connections together. In each class, I felt a profound sense of belonging and significance.

Defining Success

After having these personal experiences with these online interventions during the MAPP program, I decided to incorporate them in my virtual class. It takes time and intention to create an environment that optimizes connection online. I often had to adjust the content of the lessons, more asynchronous videos were added, less lecture time and more information learned through readings. This trade-off paid off. At midterms I asked students what they wanted less of, more of, and what they needed for the rest of the semester. Most students wrote that they enjoyed and wanted to continue the exercises that were helping them to get to know each other. We started every class with some form of motor-synchrony, personal check-in, team competition or other form of positive psychology intervention that supports connection. Throughout the semester, the students were engaged with the content and each other as seen by questions that they asked, new relevant information that they shared, their willingness to be vulnerable, and the personal support they gave each other during our synchronous classes. At the end of the semester, I received feedback that included: I know every person's name in this class I don't have that in other class, I feel I could ask anyone in this class for assistance and would get it, and I have made some friends that I will stay connected to outside of this class. The impact that I could not see but Murthy (2020) would support as being created in such online experiences where “people feel they belong to one another [is that] their lives were stronger, richer, and more joyful” (p. xxi).

Conclusion

In the Korean culture we have a term: “In Yun.” It conveys the feeling that we have met before and so this meeting feels natural, comfortable, and familiar. When I finally met my classmates in person at our graduation, I felt “In Yun.” My heart said, “There you are,” “I’ve been waiting,” “I know you.” We had met before and we did know each other very deeply. Can positive psychology assist in navigating the virtual learning landscape, effectively connecting students who are physically separated by their screens and keyboards? Absolutely. By incorporating positive psychology principles within the virtual classroom, teachers and students can authentically cultivate a sense of belonging and connection, ultimately leading to a significant enhancement of their academic performance and overall

well-being. However, this is not achieved merely by sharing screens or turning on cameras; it necessitates intentional effort, much like the process of learning and crafting a fulfilling life does.

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A Technology-Supported Course Throughline: Centering Student Voice and Agency to Create a Belonging Context

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Abstract: This reflective essay discusses a course redesigned to enhance student belonging and the important role intentional use of technology plays in creating a belonging context. Before the redesign, some course elements aimed to create a belonging context by centering and valuing student choice, and through choice, respect of identity. However, there were gaps in the pedagogical tactics related to considering the students' psychological experience as part of the class. The course redesign focused on procedures that centered student agency and voice as the core of a class learning community. Technological refinements using an online discussion tool called CN Post, strategic uses of the course LMS, implementation of anonymous review using Qualtrics, and self-publication of a student written book using Pressbooks relied on brave space discussion and solidified a co-created, course throughline in which all student voices mattered and belonged, emotionally and intellectually, to class process and learning outcomes.

Keywords: agency, voice, backward course design, learning community, brave space

For over a decade, my fall teaching load has included a three-credit hour course called “Black Markets: Supply and Demand.” This intensive writing course is available for honors students seeking a liberal arts degree and business certificate from a large midwestern university’s College of Arts and Sciences. When I proposed the course, I was told to expect broad disciplinary diversity among my students. This advice proved true: most years the number of disciplines my students are majoring in is close to the number of students enrolled in my class, which on average is capped at an enrollment of 18. Expecting this diversity of disciplines pushed and continues to push me to design the course to be highly approachable and inclusive, by centering and valuing student choice in assessments, discussion, and class activities. In short, I am concerned with having the course connect meaningfully with my students, and I believe a threshold goal is to open connections between my students and the course concepts, the students themselves, and the students and me. I acknowledge these threshold goals can be achieved without using technology; however, my students and I do strategically use technology to make these connections. These uses have become more strategic, and more explicitly planned to create a belonging context, as I have gained “wisdom” teaching the class.

One experience that provided a large pivot in my teaching took place in fall 2015. A few students articulated that the course led them to develop a sense of hopelessness due to the revelations about the types, workings, harshness, adaptability, and ubiquity of black markets we encountered in our studies. For example, one response to the course evaluation question “What did you like least about this course?” stated that “the class often ends on a sad and depressing note which makes me feel helpless about changing the world.” This feedback hit me hard and triggered a course redesign, as it diametrically opposed a desired outcome that my students could envision themselves as leaders capable of making a positive difference in an ethically complex globalized world. I had seen their work over the first five years of teaching the class and believed my described learning outcome was realistic.

In response to this feedback and in light of my belief in my students, I asked myself “how can I revise the course so that my students see that the course belongs to them as a community of learners with me as a guide?” My short answer is that I maintained the previous learner-centered approaches

on class projects and class discussion, and I boosted the role of student agency and voice in every class meeting, increased diverse perspectives introduced through course readings and resources to challenge Western-dominated thinking and to model valuing of different perspectives, and reconceptualized a final project founded on the students' emerging expertise. Uses of technology were crucial to centering student voice and spotlighting their emerging expertise in a *course throughline*. This paper describes and analyzes how this course's design leverages technology to generate a course throughline that (1) belongs to my students individually and communally and (2) builds and supports sense of belonging.

Designing a Student-Owned Course Throughline

The term *throughline* was coined by Konstantin Stanislavski to describe a character in a play's sequence of actions that grounded the character's main objective—he called it a *super objective* (Sawoski, 1984, p. 6). In the teaching and learning context the term relates to the quality of connections between learning activities, assessments, and learning outcomes (Lim, et al., 2023; see Cope & Kalantzis, 2020). To plan high-quality connections, I engage in backward course design, starting by identifying learning outcomes, then identifying assessments, then learning activities, and then finally resources (Wiggins & McTighe, 2005). I then organize a macro-level structure built primarily with manageable chunks of course content and low stakes assessment with a logical flow. With an overarching structure in place, I identify ways to emphasize what Hattie (2009) refers to as *visible learning*. Hattie describes visible learning:

Visible teaching and learning occurs when learning is the explicit goal, when it is appropriately challenging, when the teacher and the student both (in their various ways) seek to ascertain whether and to what degree the challenging goal is attained, when there is deliberate practice aimed at attaining mastery of the goal, when there is feedback given and sought, and when there are active, passionate, and engaging people (teacher, student, peers, and so on) participating in the act of learning. It is teachers seeing learning through the eyes of students, and students seeing teaching as the key to their ongoing learning. The remarkable feature of the evidence is that the biggest effects on student learning occur when teachers become learners of their own teaching, and when students become their own teachers. When students become their own teachers, they exhibit the self-regulatory attributes that seem most desirable for learners (self-monitoring, self-evaluation, self-assessment, self-teaching) (p.22).

To emphasize visible learning, I have designed a sequence of activities giving voice and agency to my students through discussions that take place pre-class, in class, post class, reinforced in a mid-semester activity, and in the class's major project. Importantly, the visible learning determines the throughline, and it emphasizes the value of each student's contribution to the collective learning. For purposes of this reflective essay, the use of technology to memorialize the throughline is emphasized in the essay and vital to establishing a belonging context. Memorializing the throughline involves three technology tools: CN Post (an online discussion tool), the course homepage in Canvas, my institution's LMS, and Pressbooks.

Establishing the Throughline

Pre-class preparation calls on the students to respond to assigned reading and sets the stage for in-person class discussion. Students have one of two task roles in the pre-class preparation, which takes place in CN Post, although any online discussion platform would work. A student is assigned *task role one* for

each class, and over the course of the semester, each student will take on this role.¹ Twenty-four hours before class, the student assigned posts three to five discussion worthy ideas provoked by the assigned reading. I call these ideas “Relevant Big Ideas” (RBIs) named after a protocol designed by Indiana University Professor of Education Daniel Hickey.

All other students are assigned *task role two*. Students in task role two have 24 hours prior to class to reply to one of the proposed RBIs. The reply must begin with a question provoked by the RBI. The reply also includes two sentences after the question: one justifying the importance of the question and a second citing something from the reading that is relevant to the question. In CN Post, the threaded discussion reply is called a “reflection.” The name will vary by online discussion tool, but it should be clear which RBI the question pertains to.

As follow up, *in class* the student assigned task role one serves as the discussion leader, with my support, and uses the other students’ questions as starting places for interrogating the reading. *Post class*, the discussion leader (the student assigned task role one) writes three to five summary RBIs, which are five-sentence paragraphs that identify and explain takeaways from our reading and discussion. The first time a student is in task role one, they share their RBI summary with the class for feedback. Once they incorporate the feedback, they post the RBI summary, which we call Final RBIs, on the course homepage. In Canvas, the student uses the Pages tool to post the Final RBIs. Pages in Canvas have their own unique URL, and I add a link on the course homepage to the Final RBIs. At this point, each learner has contributed questions, participated in discussion, and provided feedback for the RBI summary which reflects the students’ co-created takeaways from reading and class discussion. These posted RBIs accrue over the semester memorializing the learning community’s intellectual engagement with the reading and each other.

Three other points are worth making here. First, not all questions the students ask while in task role two are created equal for nurturing discussion. Opportunity to ask questions such as in an active learning class and developing an understanding of a “hierarchy” of question types leads to an improved ability to ask questions (Marbach-Ad & Sokolove, 2000). Therefore, during the class after the first questions are posted, I guide students in a reflection about “quality discussion questions.” Second, once the student posts the Final RBIs, they complete a guided reflection on the helpfulness of each classmate’s feedback and then each classmate then receives the feedback on their feedback. A technology tool called Kritik, or even email, can manage the feedback process. This process contributes to high expectations for providing feedback. These high expectations are vital in this course as the task of the major project is to write a publishable work for a class book. The third point is that many Final RBIs accrue over the course of the semester, which means that careful design of the LMS homepage is important, not only because students can easily navigate a well-designed page and course site, but also because the homepage emphasizes the visible throughline of learning.

Reinforcing the Throughline—RBI Mapping Exercise

By the time we reach the halfway point of the semester, the students will have read two books, additional readings, and we will have amassed about 70 to 80 Final RBIs. At this point, my students review the full set of Final RBIs to generate main themes of the course to date as follows:

1. I have the students work in small groups, with each group drafting proposed themes.
2. Each group then selects a representative to work with the other groups’ selected representatives to come to consensus on no more than five main themes.

¹ The black markets class is a seminar capped at eighteen students: I would adjust the process for a larger class.

3. I share to all students a numbered list of all the RBIs to date.
4. Each student then separately assigns (maps) each Final RBI to one, and only one, of the themes articulated by the class.
5. I compile the data in a spreadsheet and share it with my students 24 hours before the next class.
6. In the subsequent 24 hours, each student reviews the data, composes a thesis statement that they believe the data supports, and posts it in CN Post.
7. In the next class, we discuss the diversity of the thesis statements, the nature of the data itself, and our methodology to come to themes. We can be self-critical about where we landed on our themes or our methodology. We also communally reflect on what we are learning in the class and what it means for us as members of our local communities and as global citizens.
8. Following this class, each student sets SMART goals about contributing to the class community and meets with me to review the goals.²

Finalizing the Throughline: A Class Publication

To respond to the wide variety of student interests and majors, in the students' capstone work, they write about a course-related topic in a genre that most interests them: a research study, a movie review, book review, traditional essay, or even creative works. Around 2015, I began wishing I had encouraged my students to publish their works--the quality was high, and ideas worth sharing. By the time, I taught the course in 2018, the university had arranged a university-wide license with an authoring and book-publishing platform called Pressbooks. Thus, I was able to reimagine the course's capstone project as one in which the students author a peer-reviewed publication.

The publication extends the throughline into the capstone project and beyond the bounds of our class. As part of the publication, the students jointly compose an introduction. They return to a process similar to our mid-semester RBI mapping exercise and identify themes. They map each students' work to these themes. They engage in vibrant conversation as they prepare to publish the work. Once it is published, it is read beyond our university, which is clear as others have uploaded volumes to Merlot and at least one other university uses volumes for course readings.

The project itself is highly scaffolded. For example, at the stage of thesis formation, we have a one-class-period event I call "thesis paragraph speed dating"—a protocol in which every student receives feedback from every other student and me.³ In the second half of the semester, the students complete multiple drafts and receive feedback multiple times. We use an anonymous review process managed in the online survey tool Qualtrics. And no student can publish their work until the class agrees it is ready for inclusion in the class's volume of the *Perspectives on Black Markets* series.

Intentionality of a Throughline

Establishing a throughline across a course requires intentionality. Fung's (2015) *The Connected Curriculum* helps with understanding a successful throughline as a sense that the components of a

² During the semester, my students develop SMART goals multiple times. I encourage them to add one goal every week. They have freedom on the direction of their goals, except for the first time when I ask them to set goals for their writing skills and following the RBI mapping exercise when I ask them to set goals for contributing to the classroom community.

³ This activity can occur in person or online using tools such as Zoom breakout rooms, [kumospace](#), or [SpatialChat](#). Kumospace allows "avatars" to move around a room. Sound in a kumospace room is distance sensitive—the closer you are to an avatar the more you hear only that nearby avatar, which simulates the experience of moving between conversations in an in-person space. SpatialChat is another technology similar to kumospace.

curriculum are “joined up.” A curriculum wide throughline, which is possible to engineer, poses challenges that I did not face. For instance, my vision for the course did not require the buy-in from other faculty that is sometimes necessary for a curricular throughline; so, establishing trust among faculty colleagues was never an issue. Particular strategies, such as carrying topics through the course, were easy for me to decide on at a macro level. And since I had a clear story arc for the semester⁴, it was easy for me to describe it in the syllabus and use the story as a touchstone during the semester.

In the more complex curricular throughline, technology is indispensable as a way to create connections among courses. Yerworth et al. (2018) describe the use of a resource module included in all courses in a curriculum with a link on the homepage of each course’s LMS site as one way to leverage technology. Similarly, I leveraged the LMS so that each aspect of the throughline was accessed on the course homepage, which of course is the highest level of the course site. I believe this signaled the value of the student work visually and organizationally.

Leveraging the Throughline to Support a Belonging Context

A belonging context, or “place of belonging,” requires appropriate policies, practices, procedures, and relationships to produce places of non-prejudice (Student Experience Research Network, 2018). Terms associated with a belonging context include “identity,” “agency,” “voice,” “trust,” and “respect.” And notably “hope” (Student Experience Research Network, 2018). Much of belonging research studies sense of belonging at the institutional level (Kinzie et al., 2020); however, the research also concludes that student development of develop sense of belonging follows from experiences taking classes (Freeman et al., 2007; Tyton Partners, 2023).

To design the course for a belonging context, student agency and student self-regulation of progress toward goals and outcomes are vital. Applying backward course design effectively will inform students of learner-centered outcomes, which encourages students to view learning as a proactive activity instead of as something a teacher creates (Zimmerman, 2001). A proactive activity becomes self-regulated when the students continuously monitor progress toward a goal (Berk, 2003). This monitoring requires awareness and reflection on outcomes to redirecting unsuccessful efforts. To facilitate this monitoring, these outcomes must be visible to the students.

Strategic uses of technology set up and facilitate student monitoring of learning, which with careful design, creates community and a belonging context. The Tyton Partners (2023) recently surveyed 2000 students and found that digital learning tools can be used to create learning communities that in turn foster a sense of belonging.⁵ Gray et al. (2018) describe three types of structures that are important for a belonging context: *interpersonal opportunity structure*, *instructional opportunity structure*, and *institutional opportunity structure*. Designing a course with interpersonal opportunity structures facilitates social ties between students and between students and instructors. Instructional opportunity structures provide avenues for students to make meaning from perspectives that they hold in high regard. Institutional opportunity structures move beyond the classroom and address belonging at a school or in the school’s community. The interpersonal and instructional

⁴ The course’s overarching objective is “As we consider black markets and their relationship to our lives, we empower ourselves to think from multiple perspectives, we challenge our understanding of ethical decision-making, we map our place in the global marketplace, and we clarify our influence on far-flung markets and far-flung markets’ influence on us.” The course parses into logical chunks, beginning with an exploration of black markets and their global spread and connections, moving to human conditions that motivate suppliers and consumers in these markets, and our relationship to the markets, and reaching basics of ethical decision-making. By the end of the semester, the students are expected to articulate how they will act as ethical leaders in the complex global marketplace.

⁵ [Tyton Partners](#)’ Center for Higher Education Transformation is a strategy consulting firm for companies and educational organizations.

opportunity structures are analogous to Garrison's (2000) Community of Inquiry (CoI) framework, which relies on three "presences": social, cognitive, and teaching. *Social presence* involves identifying with a group, a trusting environment, and ability to participate as a unique individual. It is a highly relationship-based aspect of the CoI. *Cognitive presence* is when the members of the class can connect with the content to be learned and confirm understanding through engaging with the CoI. *Teaching presence* is, at its most essential, guiding the social and cognitive learner engagement.

Both the opportunity structure model and CoI model give a guided mindset to rely on when planning a belonging context. The crux of the matter is that with intentionality, instructors can design courses rich with belonging opportunities by applying well-researched practices (Mendoza & Venables, 2023). For example, Mendoza and Venables' systematic review of the literature found that the CoI model and Universal Design for Learning (UDL) (CAST, 2018) were widely used approaches to facilitate a belonging context.

Application to My Course

In my course, once I applied backward course design and drafted an overarching logical flow in a course map, I was able to analyze the map from the perspective of creating a belonging context. I found that using the online discussion tool, the LMS course site, and Pressbooks allowed me to not only design for visible learning in a throughline but also to assure the visible learning supported a belonging context. First, the use of the online discussion tool made student observations and questions about the reading the visible spine of the course. Second, this spine connected to and focused our in-person discussions in class because we had a goal as a group of helping the discussion leader finalize observations about the reading, which are the outcomes of our group learning process posted on the homepage of our course site. Third, these visible outcomes then nourish additional discussion at the mid-point of the course, and in our final group project--the publication of the class's *Perspectives on Black Markets*

Operationalizing Structure for Belonging

This plan operationalizes structures for a belonging context. These can be considered through the lens of the CoI framework (Gray, et al., 2018), or UDL principles. The day-to-day use of the online discussion tool and its connection to class discussion centers student voice related to our class, even between class meetings, and gives the students agency over the foci of each class day. Importantly, interactions contribute to a sense of belonging (Freeman, et al., 2007), especially for students who frequently discuss course content with other students outside class (Hurtado & Carter, 1997). From the CoI perspective, the process creates student presence and cognitive presence. From a UDL perspective, it also allows students to make meaning of our reading in ways that mattered to them. My presence is felt as a guide, though not discussion leader during class, as I share my expertise by injecting commentary or follow up questions. For example, I often find that during class I push the discussion by saying, "I believe we can consider this question further, for instance..." or by providing a vivid example of a black-market activity I confronted or read about in my role as an immigration attorney. Thus, my presence further centers and elevates the questions posted online by my students.

The structures leverage technology, building to our course publication by centering student voice and agency. The publication itself magnifies student voice and agency, and the assignment design relies on UDL principles. We use the Pressbooks platform as our publishing platform. Creating a book produces a URL to the publication, with the choice of making the book private or public. We make the book public; however, my students have the choice of uploading their work to the semester book, or if they should choose not to publish their work, they can turn it in directly to me. After seven

semesters, no student has opted out of publishing their work. Pressbooks also publishes text and many types of multi-media. Student projects can include videos, pictures, charts, graphs, google earth projects, text, or a blend. Beyond choice of media, students also choose their topic, which is vital given their disciplinary diversity. Thus, the genre and variety of topics vary dramatically. We have published movie reviews that reveal the accuracy of black-market depictions in the subject movie, an essay analyzing the United States' WWII anti-black-market propaganda posters, fact-based short stories that scrutinize counterfeit goods or human trafficking, and a flow chart that uses pictures and text to analyze connections of retail clothing sold locally to overseas production that relies on black market employment. Finally, each publication includes a class-written introduction. The students tend to use google documents for the drafting phase then upload the final draft to Pressbooks. They learn about meta-data and alt-text when they include multi-media and the impact on accessibility.

Culminating Belonging: The Publication as the Final Class Deliverable

The build to the publication relies on the establishment of our learning community through quality interaction. Quality interactions have multiple dimensions: spirit, trust, frequency, and commonality of expectation (Rovai, 2002). Rovai described “spirit,” and “trust” as creating a tone as members of a community embrace commonality of expectations—in a class this expectation relates to learning. Spirit, or community spirit, requires a sense of connectedness with the group, and “trust” has two components: credibility that members can be relied on and benevolence that learners are genuinely interested in each other (Rovai, 2002). The concepts of spirit and trust dovetail well with Strayhorn’s (2019) description of mattering, “we feel like we matter when we play important roles, when we feel like others depend on us, and when we command others’ attention such that our absence does not go unnoticed” (p. 15).

Spirit and trust are evident in the review process for the major publication. The reviews take place in the Qualtrics online survey tool. The class is designed so anonymous review occurs after the class has developed community spirit, trust, relationships, and commonality of expectations through the earlier aspects of the course. After receiving and reading the anonymous feedback in a Qualtrics report, each student receives class time to ask for additional suggestions or clarifications. The students also meet with me one on one. The students could opt to avoid seeking or providing feedback, but this avoidance does not happen. The students could shy away from improving their work based on the feedback; however, they do not. Their authentic engagement with their peers’ perspectives is evident in the tone and content of our one-on-one meetings. It is clear to me that belonging is a factor in student behaviors to embrace feedback through technology within our community.

Leveraging the Throughline to Include Student Thinking on Diverse Source Materials

The throughline and its co-creation are the visible outcome of the class’s belonging context, but student agency and voice are the fuel that leads to the outcomes. During a panel discussion on belonging, Gregory Walton, Associate Professor of Psychology at Stanford University, answered the question “What is the role of students being aware of and enhancing their own belonging?” He spoke about agency, saying “Students have lots of agency at higher levels. They need mindsets that empower them to use that agency. Context needs to empower that agency and allow it to become productive and effective” (Student Experience Research Network, 2018). Thus, I include learner agency as a component of a belonging context and design my course for online interactions that integrate with the classroom as a place of belonging. Bandura (2006) says of agency that “To be an agent is to influence intentionally one’s functioning and life circumstances” (p. 164). We can see students act with agency in class and if a course is designed to facilitate expressions of voice online. For example, Mitra

(2004) found that students asserting their voice is significant in the growth of agency, belonging, and competence (p. 681).

Student Voice and Respect

Mitra's finding makes sense as using voice is a visible act. The act involves cognitive ability, an actual physical action, and it has an emotional component related to confidence which is seen in taking the risk to interject. The response to the interjections, whether verbal or non-verbal, can reinforce confidence or lead to future hesitance or trepidation to further voice one's thoughts. In light of definitions of belonging, it makes sense that a learner who risks voicing thoughts will sense belonging if respected for taking risk and revealing their thinking, especially if they are encouraged, even expected, to contribute, and if they see and hear that their contributions are valued and matter to the classroom community. Evidence of this respect, encouragement, contribution, and valuing will emerge (or not) from the quality of interactions, whether virtual or in person, whether using technology or not. And this respect grounds further discussion and ongoing learning in the community. For example, Mora (2021) found that emphasizing the importance of the community and empathetic respect of ideas, even those with which we do not agree, contributes to students' successful collective action. In my classroom, learner agency is recursively and repeatedly reinforced as the class leans into the influence of each learner's voice through online discussion and interactions that ultimately lead to the learning community's expression of their final RBIs on our course homepage. In other words, agency and voice are activated through following the class's policies, procedures, and practices and are visible because of the strategic uses of technology. Respect in our classroom comes alive.⁶

Voice and Diverse Perspectives

This logical flow and frequent interactions, with my guidance, support engaging in brave contributions and more generally a context of belonging. We set the stage for these brave contributions by jointly drafting a first-day social justice. These statements typically show a commitment to empathy, openness to and encouragement of other perspectives, and an overarching respect for learning. For example, the Fall 2023 statement I as follows:

I believe that an important purpose of higher education is growth through learning. The learning should empower all members of the learning community (faculty and students) to improve continuously and to contribute to the commonwealth in ways that they find meaningful. This purpose means behaviors and language in the classroom should challenge us, and may cause intellectual tension or even discomfort, but they must not diminish other members of the learning community. In this class, we will respect your religion, race, gender, sexual orientation, political opinions, mental, cognitive, and physical well-being, and other characteristics that you cannot or should not be required to change because they are fundamental to identity. This respect requires all members of the learning community to listen actively, be open to new opinions, and monitor themselves for indications of bias so as not to

⁶ Regarding respect, 64% of students comment, in the course evaluations, on the positive quality of our in-class discussions; no student provided negative feedback on the discussions. A representative response to the question "What did you like most about this course and instructor?" addresses our discussions and the classroom community more generally. An example comment is, "He always treated us equally in class and spoke to us with respect. It did not feel like a traditional lecture, but rather a 1-hour conversation among colleagues and friends."

diminish others in our class discussions or activities. The behavioral principle put simply is that we challenge ideas, but do not diminish others.

This commitment nurtures organic co-creation of the course throughline and moves us toward establishing a brave space in the class, which according to De Novais (2021), requires academic grounding by establishing the connection between content and the academic culture. Abbott (2016) says it is not easy for students to “take those leaps or for faculty members to support them.”

This section of the essay discusses not only methods to empower student voice to take the leaps but also the importance of discussing content emanating from diverse perspectives. It details changes in course content to make the class more inclusive, with inclusion as a pathway for voice and agency as described by Claude Steele, American social psychologist and a Professor of Psychology at Stanford University, and Mary Murphy, Professor of Psychological and Brain Sciences at Indiana University (Student Experience Research Network, 2018). Steele said “Education is not a colorblind experience. One way is not easily trusted for persons from different backgrounds.” In this exchange Murphy added, “Value diversity. Give voice to difference.”

Further, in Spring 2021, I began co-authoring [a series of modules](#) to promote faculty knowledge and use of diversity, equity, inclusion, and justice in higher ed teaching. This co-authoring experience meant I reflected, often, on my own classes which inspired a rethinking of my “Black Markets: Supply and Demand” class, in particular. While the black markets class was already built on student choice as far as major projects, my reflections on course content poignantly revealed that I needed to decolonize the reading list. This effort led to policy, practice, and relational changes in my class. The changes impacted virtual and in-person components of the class. Moreover, the new reading list had the added benefit of leading my students to a deepened, learner-articulated understanding of the need for and power of agency as a foundation for belonging in society.

A high-level description of my black markets class is that my students and I consider types of persuasion at play in economic, and specifically, black-market activity. Our first text, *McMafia*, traces globalization of black markets, and touches on countries in every continent except Australia and Antarctica. The author, Glenny (2008), subtitles the book “A Journey through the Criminal Underworld.” Through the author’s investigative journalism, the students confront the bad, the ugly, and sometimes the good pertaining to black-market activity. This rich context sets up the class’s grappling with the role of the human element that powers economies, and particularly with theories of persuasion and complementary concepts such as biases and ethics. These concepts matter, of course, both from the perspective of the persuader (supply side) and the potentially persuaded (demand side).

In 2020 when I reflected on the reading list and resources relevant for our discussions, I realized all my authors were white, and mostly men thinkers, such as Edward Bernays. In my first two years teaching the course, I had some racial diversity among the authors we read. Specifically, I assigned a novel, *The White Tiger*, by Arvind Aadiga (2008), which put the concepts of entrepreneurship and ethics in discussion. *The White Tiger* is written as a series of letters from the narrator describing for the premier of China his perspective on what it takes to be an entrepreneur. In 2012, I removed the *White Tiger* and substituted it with the book *Charlatan* by Pope Brock (2008), which is a non-fiction, but almost unbelievable account of a highly successful American huckster during the first half of the 20th century.

As I attempted to revise my class to include more diverse perspectives, I struggled to find “replacements” for the concepts presented by the authors on the class reading list. While it is obvious that persuasion in many forms serves as life blood of markets globally, calling it “persuasion” did not resonate beyond Western schools of thought. In fact, even diverse groups in the United States came at the topic differently. For example, the ways the African American community has approached

influence required rethinking the framing of my reading list. I could not identify an African American Bernays or Cialdini coming at the question explicitly from a Western perspective, a perspective which, by the way, was deployed against black causes historically (Jones, 2009). I had to ask myself, what reading would present my class contrasting ways of thinking about influence?

Ultimately, I added two readings to the curriculum in place of *Charlatan*--Martin Luther King Jr.'s (1963) *Letter from Birmingham Jail* and Sudhir Venkatesh's (2008) *Gang Leader for a Day*. I was confident about the former and nervous about the latter, which is an ethnographic study of the economy during the 1990s in a Chicago project where an African American community lived. *Gang Leader* includes quotations that rely on the insider language of the project and a rich depiction of life there, which financially-speaking was largely supported by the underground economy.

Putting my fears aside, I chose to trust my students, who were second-year college students enrolled in an interdisciplinary honors certificate program. I decided to have the class come to consensus on a social justice policy because of including *Gang Leader*. With the policy in place, after two years with the new readings, I conclude that these readings add richness and depth to our understanding of the human element in the economy and inspire excellent questions. These are visible in our course throughline.

Also, reading *Letter from Birmingham Jail*, in particular, had a profound reinforcing undertone about the importance of agentic action. King's letter (1963) contextualizes marginalization of African Americans, as both the law and norms created barriers to equitable democratic and social participation in the American commonwealth. King's descriptions are rife with examples of the disrespect, othering, and devaluing faced by African Americans. Sails-Dunbar (2017) equates King's description of marginalization with a Freirean "limit situation," or in other words, as one that inhibits self-agency. For example, King said:

For years now I have heard the word "wait." It rings in the ear of every Negro with a piercing familiarity. This "wait" has almost always meant "never." It has been a tranquilizing thalidomide, relieving the emotional stress for a moment, only to give birth to an ill-formed infant of frustration. We must come to see with the distinguished jurist of yesterday that "justice too long delayed is justice denied (p.768)"

For King, all people have agency and should use that agency: "We know through painful experience that freedom is never voluntarily given by the oppressor; it must be demanded by the oppressed (p. 768)." Sails-Dunbar (2017) explains that King's letter describes how to take moral agentic action (p. 145). And what does King want to happen as a result of these actions? He says, "We have waited for more than 340 years for our God-given and constitutional rights" (p. 768). I explicate this reading here because King's call to action is about belonging; this amplifies the students' reading of materials directly related to belonging.

The notion that belonging can be achieved through activism has another interesting facet. Sulé and Brown (2023) highlight activism at the intersection of diversity and agency finding that black students who engage in anti-racist activism cultivated a sense of belonging. Whereas Sulé and Brown (2023) identify the mediating power of voice to create belonging, Pym & Kapp (2013) identify how a South African tertiary educational institution developed flexibility with the curriculum itself to activated student agency, with increased sense of belonging as an outcome. In sum, the evidence points to the importance of agency and sense of belonging in contexts where othering and prejudice have been the legal and cultural standard.

Student Voice in our Class Community

At the time the class readings reinforce the importance of voice and agency, the students exemplify this importance as they engage with the readings. They elevate their co-created thinking about the underground economies in marginalized America to our course throughline, giving voice to their growing perspectives on inclusion or exclusion. As they participate in the course, they reinforce their understanding of the power of agency in the Civil Rights Movement. This growth is visible as a large part of the course throughline specifically in online discussion, in class, and ultimately on the homepage of our course LMS.

Earlier in this section of the essay, I mentioned that I choose to trust my students. Indeed, teacher trust of students appears to mediate student connectedness (Van Houtte & Van Maele, 2012). A sample of my students' online discussion of MLK's letter is in the Appendix. It demonstrates why I trust my students to engage bravely, earnestly, and openly as they pose questions about topics such as justice versus law, oppression, urgency in action, freedom, leadership, and following. My students also resonate with the reading and subsequent discussions with a majority stating they considered the reading and discussions a positive highlight of the course. As the students progress through the semester, the technology-supported preparation and follow-up discussion become the memorialized heart of the course and demonstrable record of collective intellectual connectedness and belonging through technology.

Conclusion

While I always approached the design of this class from a learner-centered perspective, having taught it over a dozen semesters led to many refinements of policies, practices, and procedures. The most important refinements occurred as I designed with a laser-like focus on creating a belonging context. Nurturing a belonging context in a class is complicated, like the definition of sense of belonging itself. This essay describes a course redesigned with intentional combination of course design (including materials and activities around student voice), pedagogy, and strategic use of technology to address these complexities. The combination creates a throughline of visible co-created content and evidence of mattering. Specifically, the interplay of changes, including the non-technological ones, enhances student agency, centers student voice, establishes trust in peer feedback, communicates very high but appropriate expectations, and reinforces the embracing of difference as vital to our growth as individuals and as a learning community. An important takeaway is that many of the pedagogical and course design practices described in the literature as best practice are powerful tools for designing courses for a belonging context. Moreover, many technology tools increase our ability to reinforce a belonging context when strategically incorporated into a well-designed course.

In sum, I suggest six actions to enhance a belonging context in a course. While it is likely many courses or contexts may not be amenable to fully embracing each of these actions, most of the actions are reasonable steps for most courses:

1. Use backward course design.
2. Identify a macro-level logical flow for chunks of content and low stakes assessments to make learning visible regularly throughout the course.
3. Analyze the logical flow to assure the learning process will result in a student-created throughline.
4. Yield the micro-level class day focus to students and use technology to honor their foci by making it visible.
5. Include diverse source material discussed in brave spaces.

6. Use technology throughout the course to memorialize and appreciate each student's and the learning community's visible learning.

All in all, student engagement in this course, in which technology plays a vital role, has given me incredible hope in my students' abilities and motivations. Seeing them succeed actually strengthens my sense of hope generally. As my students complete this class, they become the throughline. They know they matter. And while the course considers black markets and the human element that drives the markets, the course is not really about black markets. It is about my students and their growth achieved through participation in a learning community to which we all clearly belong.

Appendix

Appendix 1. Proposed RBIs and questions after reading MLK's Letter to Birmingham Jail.

Main point 1: A law may be just in writing, but unjust in application.

Student 1: What happens when a law is just to someone and unjust to another? If the law is not just to everyone shouldn't the law be seen as unjust as a whole? Since laws can be misinterpreted in writing, and injustice may not be known until the law is put into action, those who see the law as just may not understand the injustice they are causing just yet.

Student 2: Who determines if the law is just or unjust in application? Everything in life gets misinterpreted in some way, shape, or form. When this happens who is the one to determine that a law is being unjust in its application. People who look at a law differently than someone else could interpret it in their own way. This happens all the time with something as simple as a grocery list from your mom. In everyday life, there is something that is misinterpreted. When something like this occurs the ability to determine the justness of an application is extremely ambiguous.

Student 3: Should there be a more adaptive judicial review process? We all know how long it can take for laws, particularly long-standing ones, to change. But is that bad? Would hastening the process lead to more confusion and error? Or would it simply make for better laws, and everything else is overthinking it. I think it could even be both, if we tread carefully.

Main point 2: Freedom is never voluntarily given by the oppressor.

Student 4: How can we apply this thinking of "now is the time to act" to modern-day issues of injustice? I know people like to wait until a situation escalates to a crisis before acting, so I think MLK's letter really resonates today. When we are faced with injustice, such as police brutality or climate change, the time to act is always now. Waiting for permission or when the time is right just pushes the issue off into the future.

Student 5: How is the timing of resources collection and finding leadership important to the start of social justice issues? With the example of MLK, there would not have been as big of an impactful blow to society without the support of the accumulated resources and leadership of someone brilliant like MLK. Without the resources and leadership, the impact might not have been as great as what it was, or there would have been a completely different ending to the civil rights movement in the 1960's. Without greater leadership, a social movement could turn to chaos and there will not be anything lasting achieved.

Student 6: Can oppressors truly "convert" or realize their wrongdoings? On page 1, King states that "IN ANY nonviolent campaign there are four basic steps: collection of the facts to determine whether injustices are alive, negotiation, self-purification, and direct action." Self-purification implies that an individual is capable of realizing their own biases or unjust actions and adjusting them. Do we truly see this behavior in the real world?

Student 7: Is this generally because the oppressor is truly malicious, or are they just resistant to change? MLK talks about this idea in relation to the attitudes of the "moderate whites" in the fight against segregation. Racially biased groups like the KKK are what immediately come to mind when you think about opposition of racial freedoms, but in reality it is the unmotivated majority of people too uninspired to join in the fight for change that inhibit progress the most. Even though moderate whites may not be openly campaigning for the benefits of segregation, deep down they are ultimately just content with the way things are. Oppressors come in various forms, but it feels like this group of people is simultaneously one of the most overlooked and smothering demographics.

Main point 3: There is a disconnect between the white church and its leadership with the oppressed in the outside world.

Student 8: What happens when there is this disconnect between the leader and followers in society? As a society, we see this all too frequently of leaders not actually understanding the life that the people they are "leading" live. I think most of society understands the power that comes with being a sacrificial leader; one who is actually willing to be open and do the things of their followers. What are some of the major consequences in the situations where leaders lead blindly?

Student 9: How does this disconnect translate into what people think of the church? In his letter, MLK acknowledges the disappointment he feels in his church because of how they have responded to the racism between Black and White people. He feels like he was let down and thought out of anyone they would have supported the movement for equality. How did these responses from religious leaders increase the segregation between Black and White people?

Student 10: How did any white members of the church not realize what they were doing was morally wrong? A "follow the leader" mentality may have taken hold on the society causing this to happen. Even if they knew what they were doing was wrong, they may not have wanted to be the first to step out and say something. This is difficult to do for any cause, let alone such a serious one.

Student 11: Why are these leaders so reluctant to speak out against this issue and take the proper steps to address it? These leaders have so much power at their disposal--enough power to impact the masses. Yet, they are unwilling to use that power to change society for the better. Is it that these leaders' priorities do not lie with helping those who are oppressed, or that they are worried about what might be risked if they do address these issues?

Here I include an example of a main point and posted questions regarding Gang Leader for a Day, chapter 8, which as I mentioned above, I was nervous about including in this course:

Main point 1: Gentrification creates large problems for those in the projects.

Student 1 question: How do we counteract gentrification to promote affordable housing for lower-income homes? When homes are torn down, it is clear, as noted in the book, the only interests at play are those invested in real estate. In Chicago specifically, the Daley administration was even involved, as the tearing down of Robert Taylor was a huge land grab and it benefitted those who were already

wealthy (268). I feel like we have talked about this a lot in class, but how do we counteract this greed? What is it going to take for people to believe more in the common good than their own self-interest?

Student 2 question: How can the people within Robert Taylor survive when it's broken down? Due to this immense threat of their home being torn down, everyone is struggling to figure out what happens next. Most of these people have lived in the projects their whole lives. This means that they have never dealt with traditional ways of renting a home. For example, working with a landlord or a company. How will they be able to survive if they've only been taught the skills of how to survive in the projects?

Student 3: Is there a way to start fixing the issues within the projects while not just tearing the structures down? Tearing down the residential structures is not the solution; in fact, it just creates a shortage of housing and results in larger issues. I can understand that some buildings might be too far gone at this point to allow them to stay standing, but what is a solution besides leaving these people homeless?

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Transformative Praxis: A Critical Design Framework for Inclusion in Technology-Rich Learning Spaces

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Abstract: Drawing on transformative, critical, and culturally responsive and sustaining traditions of pedagogy and instructional design, we present a technology-focused framework for decentering normative forces along the lines of race, ethnicity, class, language, religion, ability, sex, and gender in online higher education learning spaces that honors each participant for who they are with respect to their identity markers and their intersectional community memberships to promote inclusion and belonging. These normative forces—which simultaneously crowd out and make hypervisible diverse identities—predispose the ends and processes of teaching and learning and structure the nature of academic disciplines. This is particularly apparent online where engagement is decoupled from traditional anchors of relationships and influenced by difference-blind neoliberal perspectives. In response, we provide a framework for inclusion and belonging along two vectors. The first vector is a critical design process inspired by backward design principles: inquiring, translating, activating, and reflecting. The second is a set of inclusive considerations grounded in culturally relevant and responsive pedagogy and the Universal Design for Learning framework: asset-based frames, authentic multiple modes, and mixed mirrors and windows. This process includes an opportunity to interrogate the role of technology as a mediator of learning and teaching for belonging. We further assert that the instructor also needs to engage in identity work to interrogate their positionality in online environments with respect to not only observable and cultural identity markers but also academic disciplinary identity. To illustrate our framework, we provide reflections on the design and enactment of online and technology-rich activity structures that promote inclusion and belonging.

Keywords: educational justice, intersectionality, identity, instructional design, higher education, belonging, inclusion, educational technology

The Entanglements of Belonging, Inclusion, Identity, and Community

As higher education faces an “enrollment cliff” (Campion, 2020; Harvey, 2021; Robinson & Maitra, 2020), it has become a critical mission for postsecondary institutions to create spaces in which students feel welcomed with supports for them to succeed and as if they are meant to be there (Gachago et al., 2023; Jones & Nangah, 2021)—that they *belong*. The flipside of belonging, *alienation*, is rightly viewed as a state to be avoided, as it can lead a student to withdraw from the learning process and potentially to withdraw from higher education entirely (Jones, 2022; Pusztai et al., 2022).

Belonging as a concept, however, is opaque, contested, and unexpectedly difficult to conclusively define. Belonging is typically framed as an emotional state (Fong Lam et al., 2015; Gillen-O’Neel, 2021; Wood & Waite, 2011) so that feeling as if one belongs feels “good” or “safe.” Deep

and transformational learning can occur, though, when the student encounters a cognitive-social sense of disequilibrium (Bowman, 2010; Che et al., 2009; Gurin et al., 2002), a feeling that feels neither good nor safe. In addition, there are also structural and normative forces that factor into how students engage and interact with each other, the content and learning activities, and the instructor, such as race, ethnicity, class, language, religion, ability, sex, and gender (Harpur et al., 2023; Kolluri & Tichavakunda, 2022; Patel, 2015). These structural forces are not “emotional” in origin, even though the impacts of those forces may result in emotional resonances (Duran, 2021; Fasching-Varner et al., 2014; Kelly et al., 2021). We therefore extend the concept of belonging with the broader and more poignant concept of *inclusion*, which recognizes, acknowledges, and honors extra-emotional states such as justice and equity (Salmi & D’Addio, 2021) and supports encountering barriers with a sense of agency (Moriña, 2017; Núñez, 2014; Suzuki, 2017).

To promote belonging and inclusion, it is necessary to further delve into the normative forces in higher education that effectively define what a “good student” looks like and how a “good student” behaves or succeeds. The normative nature can simultaneously crowd out and make hypervisible diverse identities (Reddy, 1998), predisposing the ends and processes of teaching and learning, and structuring the nature of the academic disciplines (Jantsch, 1972; Strandbrink, 2018). This combination of normativity and predispositionality is antithetical to an authentic sense of belonging and inclusion. The normative phenomenon is particularly apparent in online courses where engagement is decoupled from traditional anchors of relationships (Castells, 2000) and influenced by difference-blind neoliberal perspectives (Baxter et al., 2018; Keehn et al., 2018).

In response, we provide an instructional design framework for inclusion and belonging with technology that accounts for this range of contextual, structural, and intersectional identity and community factors. To ground the framework, we draw on Schwab’s (1973) notion of commonplaces (see Figure 1) to structure and bound the approach. The four commonplaces, or areas of consideration during a design process, are *learners*, the people who are intended to grow and develop through the educational experiences; the *educator*, who works to structure and curate the learning environment (which is situated at the intersection of the commonplaces); the *subject matter*, or the disciplinary knowledge, skills, and practices that are intended to be taught; and the sociocultural *milieus* in which teaching and learning are embedded, including the identities that students represent, the communities in which they are embedded, and the historical and political landscapes that influence activities. The goal is to engage in a dialectic between the four commonplaces, identifying the tensions and congruences in each area to provide an effective learning environment in which students’ identities, communities, and agency are recognized and honored to promote a place primed for belonging and inclusion. We operationalize these concepts through our critical design praxis framework in the following section.

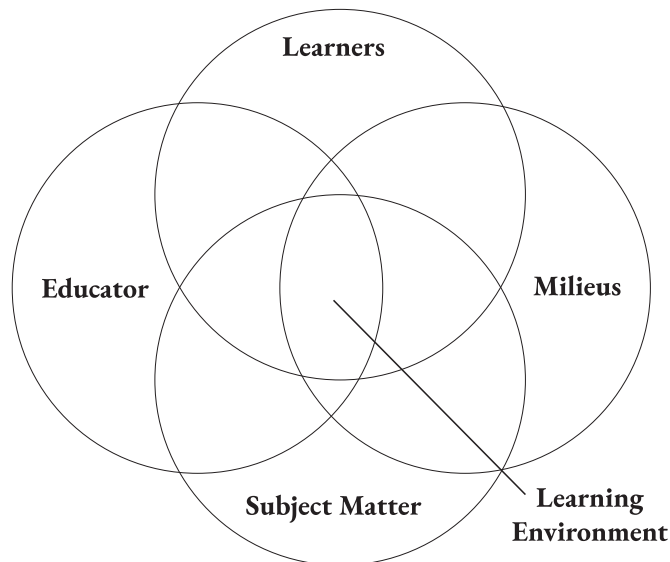


Figure 1. Schwab’s (1973) commonplaces of learning.

A Framework for Critical Design Praxis for Belonging and Inclusion

Our framework for inclusion and belonging is composed of a *critical design process* and, at each stage of the process, *prompts for consideration*. The critical design process is inspired by principles of backward design (Stone Wiske, 1997; Wiggins & McTighe, 2005) and follows a pathway from *inquiring* to *translating* to *activating* to *reflecting*. The prompts for consideration, which are grounded in culturally relevant and responsive pedagogy (Gay, 2018; Ladson-Billings, 1995; Sims Bishop, 1990) and the Universal Design for Learning framework (Cioè-Peña, 2022; Fitzgerald, 2020; Rose & Meyer, 2000), include *assets-based frames*, *authentic multiple modes*, and *mixed mirrors and windows*. The prompts should be considered at each stage of the process, and the process is intended to be cyclical in nature (see Figure 2) to allow a deepened understanding of belonging and inclusion with each journey through the process. We also provide specific questions to support *intentional uses of technology* as a medium through which learning, teaching, belonging, and inclusion can take place. After introducing the framework, we provide two reflective cases from our experiences utilizing the process to plan and teach courses that integrate technology and promote belonging and inclusion.

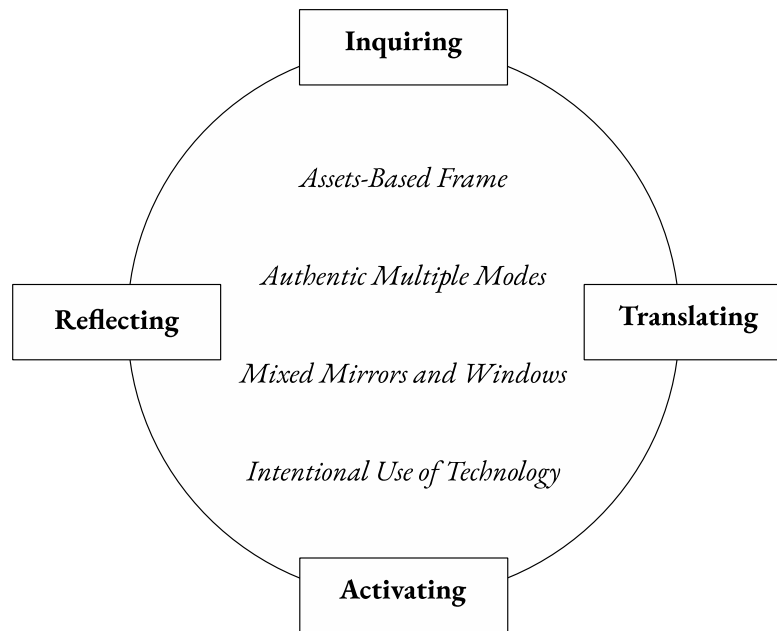


Figure 2. Critical design process cycle with prompts for consideration.

The Critical Design Process: From Inquiring to Reflecting

Drawing on a foundation of backward design (Stone Wiske, 1997; Wiggins & McTighe, 2005), the critical design process starts with “the end in mind,” interrogating one’s syllabus and activities through the ultimate goals of the course. Backward design forces the educator to consider such questions as:

- What should my students know and be able to do by the end of the course?
- What is worth knowing in my course and my field, and why is it important?
- How do the knowledge and practices of my field connect to my students’ experiences and backgrounds?

Rather than taking the activities and assessments of a university-level course—readings, papers, problem sets, exams, discussions, and lectures (the default in-class activity)—for granted, a backward design process allows the educator to intentionally base their selected activities and assessments on the goals. This intentionality not only facilitates deeper understandings and a better command of disciplinary-based practices (Davis & Autin, 2020; Michael & Libarkin, 2016; Mills et al., 2019) but also fosters a greater sense of authenticity and agency, requirements for building belonging and inclusion (Pinner, 2014; Silverstein, 2019; Vaccaro & Newman, 2017).

With this intentionality in place, the critical design process proceeds in a cyclical manner where the final stage—reflecting—is intended to bring the educator back to the first stage—inquiring. The stages are not intended to be lockstep and serial, and some stages can proceed concurrently and in a different order from that presented here. Generally, however, we have found the following pathway to be useful in our own planning and consistent with course design strategies.

Inquiring

Inquiring is the stage in which the course goals, materials, and activities are interrogated and problematized (Green, 2010) in the light of the standard disciplinary knowledge and practices students are expected to learn while considering students' lived experiences, the identities they represent, and the communities from which they emerge (Birbal & Hewitt-Bradshaw, 2019; Hongboontri & Noipinit, 2020). Some of this involves learning who your students are and what their ultimate goals are for themselves and how they might use what they learn in the course, as well as fully understanding the *default theories* (Ladson-Billings, 1995) that are bundled with disciplinary knowledge and practices. Uncovering *essential questions* (Wiggins & McTighe, 2005)—questions that by design do not have one correct answer, allow for multiple entry points, and help students build knowledge and practices—is an important part of the inquiring stage.

Disciplinary default theories are often tacitly understood by academics and educators who have adopted the epistemological and practical knowledge required for success, in essence assimilating into the field, whereas they may be a disorienting and labyrinthine set of hidden rules and expectations for students. By default, many courses are taught to induct students into an academic position in the field (Boud, 1990; Molesworth et al., 2009). Part of inquiring is understanding the signature pedagogies (Shulman, 2005) of one's field to determine how they fit into one's courses and how they connect with one's students' lives, communities, and ultimate goals. It may be that for some courses the signature pedagogies do not figure into the purpose of the course at all, whereas for other courses the signature pedagogies need to be intentionally identified and culturally, experientially, and cognitively connected with students' lived experiences.

The inquiring stage concretely involves exploring the following prompts when planning and designing a course:

- *Understand your students.* Understand who your learners are in both concrete and abstract ways, understanding individual student strengths, needs, and experiences as well as the communities with which they identify.
- *Develop essential questions.* Essential questions allow you to determine the broad areas of focus in the unit, lesson, or experience by determining what will be uncovered during the learning process and what is important to understand and be able to do.
- *Identify and problematize default theories.* The disciplinary knowledge and practices bundled in your course may be there intentionally or by accident and are always oriented toward a particular goal for students whether you realize it or not. Uncovering the default theories, epistemological and practical assumptions, and signature pedagogies of your discipline is essential. It is important to interrogate and problematize these underlying theories to understand what is being favored, what is being left out, and what is being sustained.
- *Highlight challenges and opportunities.* Thinking ahead and mapping out the potential challenges and opportunities of engaging with students on this topic will provide you with an understanding of where scaffolding may need to be provided or what might need to be adapted to facilitate deep learning and transformative activity.

Translating

Translating is the process of transforming goals and questions into actionable experiences through the curation of materials, the development of activities and assessments, and the design of scaffolding.

The starting and end points are identified in the inquiring stage, but the pathways for learning are mapped out in the translating stage.

Just as the ends and goals of one's courses are not neutral, neither are the materials and experiences. The materials, resources, and activities can provide opportunities for growth, authentic belonging, and inclusion, or they can serve to reinforce default theories of what a good student should look like and how they should behave. A reinforcement of default theories would require students to suppress their identities and community memberships and assimilate or conform to a rigid and complex system of epistemologies and practices that are not their own (B. A. Brown, 2004; Halsey et al., 2020). In addition, given the novel nature of discipline-based content and practices, it is essential to anticipate where learners may need support and scaffolding (Bransford et al., 2000; Lee, 2017) to make sense of, understand, and grapple with (rather than assimilate) the ideas and practices that are being shared with them. Translating involves exploring the following prompts:

- *Formulate goals and markers.* Along the pathway of deep and transformational learning, it is important to set guideposts so that you and your students are on a good path. Developing a set of intermediate and long-term goals facilitates this process.
- *Identify resources.* Resources and materials are important for students' learning and exposing them to new ideas and information, as well as offering opportunities to see themselves in the curriculum. Resources can be any type of media (books, websites, videos, podcasts, etc.) or even people, such as content experts or community members, among others.
- *Design activities.* Activities are where learners make sense and meaning by comparing new information and practices against their own knowledge and experiences and prepare plans for future engagement. Following the essential questions and the goals and markers as guides, activities provide concrete pathways toward deeper understandings and transformative practices.
- *Develop scaffolding.* Learners are diverse and require varying levels of scaffolding to ensure equitable engagement with the learning environment. As resources are identified and activities are designed, intentional structures of scaffolding are developed to ensure this equity and growth.

Activating

The activating stage is what most people think of as the actual acts of "teaching," engaging with learners, materials, and activities. Whether online or off, this stage requires real-time adjustment and judgment to ensure that supports and scaffolding that may not have been predicted are put into play as needed. At the core of this stage is the idea that with appropriate planning and facilitation, the learners become agents of their own learning and support each other in the process (Loeng, 2020). This fostering of agency is most effective in a learning environment oriented toward personal and social transformation (Alam, 2022; Pattiwael, 2019). Activating is supported by the exploration of the following prompts:

- *Teach and interact.* Enact the lessons, engage learners in activities, and provide feedback. Whether face-to-face, online, or hybrid, learners have the opportunity to engage in deep and transformational learning.
- *Provide opportunities for peer-led support.* One instructional asset that is often overlooked is peer support. When engaged with intention and guidance, peers can help each other learn, grow, and succeed in ways that educators may not be able to.

- *Provide just-in-time scaffolding.* As additional scaffolding and guidance may be necessary to fully engage in deep and transformational learning, you should bring in additional resources and activities to support learning.

Reflecting

The reflecting stage allows the educator to look back and think forward to the next lesson, unit, or experience or to plan for the next time the lesson, unit, or experience is enacted. The work of Schön (1990) forms the underlying conceptual groundwork for reflective practice. Schön asserted that the basis of reflection is the process of framing and reframing. Reflection in professional practice involves analyzing an event within its context (framing) and viewing it in a new light based on other experiences or plans for future action (reframing; Farrell, 2003). In this context, educators can explore their course and their teaching through the following prompts that mirror the framing and reframing process:

- *Evaluate.* In evaluating the process, you can ask, what deep learning and transformational learning have my students developed? What met my students' needs and what did not? What just-in-time scaffolding did I add, and should that scaffolding be integrated from the beginning next time? What could I have done differently?
- *Modify and adapt.* Based on the ideas surfaced during evaluation, you can make adjustments and modifications for new experiences moving forward, as well as modify and adapt the experience for future enactments.

Deepening the Process with Cultural Relevance, Responsiveness, and Universal Design

The process outlined above provides a general pathway for educators to follow, but it is necessary to deepen the process to provide clear guidelines for belonging and inclusion. With that in mind, we drew upon culturally relevant pedagogy (Ladson-Billings, 1995), culturally responsive pedagogy (Gay, 2018; Silverstein, 2019), and Universal Design for Learning (Cioè-Peña, 2022; Fitzgerald, 2020; Rose & Meyer, 2000, 2002). These foundational frameworks have three principles in common: an acknowledgment and recognition that *all students can learn*, and indeed, this recognition is tied to belonging, inclusion, and justice; a focus on the *learning environment* rather than specific attributes of the student, and how the environment can support or hold back students' learning; and a strong sense of *transformation through learning*, that the classroom, the campus, and the world can become more just places when a broader range of learners are offered an environment where they can succeed and contribute. These frameworks are combined in novel ways below to provide a deepened and more transformative set of prompts for consideration to explore at each stage of the critical design process.

Asset-Based Frames. The idea of an asset-based frame draws on the common principle in all three of the foundational frameworks that each student is capable of learning; if it appears they are not, it is because of some mismatch between the learning environment and the student and their background rather than that the student is unable to learn. This idea helps remind educators to see the assets that students bring with them—a vessel overflowing with cultural wealth and capital (Yosso, 2005)—rather than an individual who lacks or is deficient in disciplinary knowledge and practices (Solorzano & Yosso, 2001). It is further centered in the idea that every person, student, learner, educator, family, and community member is intrinsically valuable. At the postsecondary level, educators often see students only within the context of their courses and forget or discount the value of the milieu in which their students are embedded (Schwab, 1973). This means that education for belonging entails “working with” rather than “working on,” avoiding a “medical model” in which

learners' "deficits" are fixed through interventions (Dampier et al., 2019; Pfotenhauer et al., 2019; Triano, 2000). It means treating each learner, representing a set of identities and emerging from and embedded in communities, as a partner and contributor rather than a receiver or trainee. An assets-based frame allows the educator to ask the following questions at each stage of the critical design process:

- Am I viewing students as "deficient" because they do not know ideas and practices I think they should know, or am I viewing my students as knowers and doers of many ideas and practices that can be deepened and extended through teaching and learning with me?
- How do my materials, activities, and assessments enable or hinder students?
- How am I facilitating a learning environment in which students can contribute fully as people with cultural and community repertoires of knowledge and practices that can build on and extend disciplinary epistemologies and skills?

Authentic Multiple Modes

The concept of authentic multiple modes is rooted in the transformative idea that students can impact their classrooms, campuses, and worlds through "authentic" educational activity (Ladson-Billings, 1995, 2016) and the idea that to facilitate deep and successful learning, students need the opportunity to represent what they know and can do through multiple channels (Fritzgerald, 2020; Rose & Meyer, 2002). *Authenticity* involves experiences that challenge students to explore and address real-world issues, tensions, and questions through discipline- and justice-oriented lenses (Herrington et al., 2014; Serrano et al., 2018; Stein et al., 2004). *Multiple modes* refers to the practice of providing students with a range of options in terms of how they make sense of or express what they know and are able to do—including traditional papers and exams, presentations, videos, music, and other forms of expression. By providing a range of different options—which digital technology is primed for (Rose & Meyer, 2002)—in authentic learning environments, students will be able to learn and express their understandings in ways that are not possible through tests, papers, and problem sets alone. Considering authentic multiple modes, therefore, prompts the educator to ask the following questions:

- How do the activities and assessments in my course allow students to demonstrate and reflect on what they have learned and can do in a range of ways and media?
- How does my course provide opportunities for students to engage within relevant, authentic, and meaningful contexts for learning and growing, not just in the discipline, but also in society?

Mixed Mirrors and Windows

The mixed mirrors and windows prompt is grounded in providing materials, resources, and experiences that allow a broad range of identities and communities to see themselves mirrored back and to understand the perspectives of others through a range of media and channels. It is based in the foundational idea that *providing mirrors* allows students and communities to see themselves in the curriculum and that *offering windows* allows students and communities to understand and cultivate a respect for the experiences and perspectives of others (Sims Bishop, 1990). The idea of *mixed* mirrors and windows indicates the insights gained from the Universal Design for Learning framework, that students' engagement and interaction with content can be facilitated through videos, music, and other means of expression, not just through texts. Offering mixed mirrors and windows is a necessary part

of facilitating a thriving and sustainable, diverse, pluralistic, and democratic society because without the ability to see oneself and the opportunity to learn about others, one loses sight of people's wholeness as a society (Nussbaum, 1998). Considering mixed mirrors and windows allows the educator to ask the following questions:

- How does my course provide multiple ways for students to access and interact with content?
- Who is represented in my course? Can all my students see people like them and learn from people not like them from my course?
- What cultural repertoires are highlighted and explored through the course? Does the course represent a full opportunity to connect with diverse cultural repertoires that can connect with my discipline and course content?

Intentionally Utilizing Technology as a Medium for Teaching, Learning, and Belonging

Technology can serve as a medium on which growth and learning take place (Hlynka & Nelson, 1985; Santamaría Graff et al., 2022; Stephens, 2014). Much like the agar medium covering the base of a petri dish, technology provides a surface on which learners and instructors can interact, engage, exchange, grow, and learn. We recognize, however, that technology is not neutral (Benjamin, 2019; Nardi & O'Day, 1999). As Postman (1998) has outlined, technological innovations never benefit all members of society equally, leading to inevitable trade-offs, and the design and construction of technology cannot help but convey at least one “powerful idea.” In educational settings, the powerful ideas conveyed by technologies are typically steeped in assumptions of neoliberalism (Shutkin, 2005) and techno-utopianism (Castañeda & Williamson, 2021), uncritical approaches that reinforce an instrumental approach to learning and teaching (Delanty & Harris, 2021). When technology is not intentionally selected and utilized, technology tools will reinforce, sustain, and expand exclusionary structures such as racism (Benjamin, 2019; Noble, 2018; Tettegah, 2016), economic inequalities (Postman, 1998), and ableism (Hehir, 2007; Wolbring, 2012).

With intentionality and planning, technology can be oriented toward belonging, inclusion, and justice. The following questions provide guidance for selecting and utilizing technology to support design and teaching for belonging and inclusion:

- What trade-offs am I negotiating by using a specific technology tool? What will my students be gaining, and what barriers will the technology present?
- What “powerful ideas” are carried by utilizing a specific technology tool? Is it that learning is a game that should be done for points? That learning occurs in full view of peers and instructors? Are these the “powerful ideas” that I want my students to engage with through my course?
- Are there ways that the technology tacitly or explicitly reinforces racial, cultural, linguistic, economic, or ableist hierarchies, and if so, how can I resist that as a course to promote belonging and inclusion?

Reflecting on Teaching Experiences

This section provides an overview of two activity structures that are grounded in and emerge from the critical design framework. The first example is a way to read and interrogate texts with technology in a way that builds belonging and inclusion. The second example is a way to provide a media-rich and authentic final project.

Social Interrogation of Texts with Technology

An example of the critical design framework being used is in a fully online course delivered in the Canvas learning management system as part of a certificate program for high school teachers to teach college-level courses. Collaborating across university instructors and instructional designers, we considered who the learners were in the inquiring phase: The students enrolled in this certificate program were practicing teachers and we determined that it would be valuable to draw on their assets and experiences as teachers to design the learning activities for the course. Through the process of translating these understandings into goals and learning activities, we ensured there were opportunities for the students to engage with and learn from each other and their experiences in the classroom setting. Additionally, we wanted to provide authentic multiple modes with a variety of ways for learners to engage with content and show their learning. Moving through the phases of the critical design framework, we designed and developed several inclusive learning activities.

One learning activity in this course was a 2-week reading jigsaw. The reading jigsaw learning activity draws on the assets of learners, engages students in mixed mirrors and windows, and provides authentic multiple modes for the learners to explore. To provide scaffolding for students, we anticipated the specific steps the students would take to complete the reading jigsaw. We started by dividing the students into two groups. Each group was assigned a different reading and provided with guiding questions to help them identify important takeaways from the reading. Each student needed to read their assigned reading and together they became an expert group on that reading. Next, each student was prompted to download a copy of a reading matrix and answer guiding questions based on the reading. After that, each expert group would contribute to a single reading matrix and collaborate asynchronously to identify the key takeaways from the reading. Once the expert groups completed their shared reading matrix, the next step was for each student to create a VoiceThread presentation to demonstrate how they could teach the readings to their class. We then paired each student with a classmate from the other expert group to watch each other's VoiceThread presentations. Finally, they completed the other half of the matrix using what they learned from watching the VoiceThread presentation.

The reading jigsaw is just one example of a learning activity in a course where the critical design framework was used. Considering the vector of backward design along with the vector of asset-based frames, authentic multiple modes, and mixed mirrors and windows, we were able to use technology to build belonging and inclusion in this course.

A Media-Rich Authentic Final Project for Engineering Students

In developing a course for future engineers, the final project and its support activities were designed to represent mixed mirrors and windows and asset-based frames. The course was designed to introduce participants to the field of engineering and to help them develop their identities as engineers and technologists. Using backward design, the instructor determined that the final product of the course should be a project in which the participants would collaborate with others to investigate an issue within engineering and technology and co-construct solutions to address these problems.

To prepare for this work, the instructor engaged in inquiring to learn who the students were, the values they hold, how they learn and process information, and what strategies the participants employed to collaborate and complete tasks. To accomplish this, the instructor assigned the 16 Personalities online test to the participants as an activity. The 16 Personalities platform builds on the Myers–Briggs Type Indicator and provides engaging avatars, in-depth analysis about the interaction between types, and descriptions of personality work styles. After the participants completed the assessment, the instructor was able to intentionally group them by the outcomes and ask them to

compare information on their different types, discuss how their types work together, and analyze the different strengths that each person can bring to the group when working together. This activity emphasized the various assets of each group member, allowed them to see themselves in different ways, but also presented the experiences, approaches, and perspectives of other people around them. The instructor used these mirrors and windows to continue curating online videos and other resources that helped the groups effectively complete their final project.

During the translating stage, resources and materials were identified for the participants to provide a better understanding of core course concepts. As an example, a video about the Pegasus security technology was identified and included in the course to present issues pertaining to cybersecurity. Using this video in combination with Kaltura (<https://corp.kaltura.com/>), an online video quiz was created: Each group defined what ethics meant to them, identified the stakeholders surrounding the technology, identified how their own backgrounds in engineering could contribute to cybersecurity technology, and described how their expertise could contribute to addressing the issues raised in using the Pegasus technology. This quiz allowed the instructor to directly translate some of the course concepts, such as engineering ethics, data security, and community impact, into personal and relevant experiences for each of the participants. In addition, this activity served as intentional scaffolding developed by the instructor to ease students into the concepts that they would have to apply in their final projects. Such scaffolding is an important feature of translating.

After activating the knowledge developed through the 16 Personalities assessment, the Kaltura activity, and other learning experiences in the class, the instructor presented the participants with a final project that allowed each group to select an issue in engineering and technology that was important to them and to develop a webpage using Microsoft Sway that would explain the problem, describe the individuals impacted, discuss the ethical considerations surrounding the problem and solution, and then elaborate on the solution that the group designed. To present this final project, the instructor taught a hands-on three-lesson series that focused on how to use Microsoft Sway, how to conduct research on issues within engineering and technology, and how to synthesize group members' ideas with existing data. As a part of this process, each member had to develop individual reflections on how they would contribute to the group's work and submit it within the 1st week of project planning. These lessons and activities allowed the instructor to further activate students' knowledge by providing engaging instruction and giving students the opportunity to leverage their own agency to pursue their own interests in engineering and technology.

At the conclusion of the project, the instructor reviewed each Microsoft Sway site and personally reflected on how well they had conveyed the course concepts by assessing the extent to which participants demonstrated an understanding of the materials. The instructor considered other tools and methods to address the course concepts based on the groups' Sway sites. Also, the instructor determined what to revise for the next course to best meet the participants' needs and leverage the strengths that they bring to engineering. Adapting and adjusting the course curriculum for future classes is a key element in the reflecting phase. In reflecting, the instructor was able to consider the experience as a whole and to make changes that would lead to being more responsive to the needs of each student.

Conclusions and Final Reflections

In this article, we have identified the need to engage in a process of critical instructional design with technology to promote belonging and inclusion in higher education, presented a framework that provides a pathway to do so, and provided models for what this looks like. Thus far, we have been focused—rightly so—on students and their interactions with the coursework and each other. For the process to be truly *transformative*, however, there needs to be work, growth, and change on the part of the instructor as well (Castelli, 2011; McCune, 2021; Ouyang et al., 2020). A design process or learning

experience is not transformative if the instructor is also changed by the process; the instructor, after all, is represented by one of the commonplaces (Schwab, 1973).

Although the processes of inquiring, translating, activating, and reflecting through assets-based frames, authentic multiple modes, and mixed mirrors and windows are indeed work, it is also necessary for the instructor to pay attention to themselves and their learning, their growth, the biases and assumptions they bring, and how they change as a result of interacting with students. We assert that the instructor needs to engage in identity work (Bataille & Vough, 2022; A. D. Brown, 2022; Watson, 2008) as part of this critical and transformational process, to interrogate their positionality in learning environments with respect to not only observable and cultural identity markers (Crowley & King, 2018; Price-Dennis et al., 2021; Schwartz, 2020; Sealy-Ruiz, 2023) but also their academic disciplinary identity (Haynes, 2023; Henkel, 2005; Hyland, 2002). This process of self-interrogation will lead to learning environments that are rooted in belonging and inclusion and contribute to a more just and equitable society and world.

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UDL for Inclusive Teaching: Offering Choice to Increase Belonging Through Technology

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Abstract: This qualitative case study investigates the impact of the universal design for learning (UDL) framework paired with multiple educational technologies on student engagement and sense of inclusion and belonging in the classroom. Research has indicated that a sense of belonging has a direct impact on success among undergraduate students. I saw increased evidence of belonging among students in my class after incorporating choice for my students in all the ways they interact with me, each other, and the course content. This article summarizes the revisions made to the course, the educational technologies used to implement those changes, and qualitative data that supports my hypothesis that a technology-supported UDL approach can have a positive impact on feelings of belonging among college students.

Keywords: universal design for learning, engagement, inclusion, discussion, alternative assessments, educational technologies, qualitative case study

A growing body of literature indicates that belonging is an important indicator of student success in higher education. It enables inclusive learning environments, creates actively engaged learners, and leads to improved education outcomes and retention (Araújo et al., 2014; Lu, 2023; Strayhorn, 2019; Walton & Cohen, 2011). However, this sense of belonging can be more difficult to create and sustain in diverse college students from underrepresented backgrounds (Gopalan & Brady, 2020; Juarez, 2021) and those with disabilities and/or need for academic accommodations (Moriña & Perera, 2020). Although it is clear that a sense of belonging has far-reaching impacts on student success, what is less clear are the practical pedagogical strategies that can be used to create a sense of belonging in the classroom. This article presents a qualitative case study on a course I teach where a technology-supported universal design for learning (UDL) approach was incorporated into the revision of an undergraduate course. The goal of this course revision was to offer choice, increase engagement, and ultimately foster a sense of belonging for all students in my classroom.

Background and Literature Review

The UDL revision of my course began in response to a specific dilemma: How can I improve student participation in class discussions? Every class I have taught in higher education (at a large, R1, land-grant institution) has been discussion based. I began my career as a first-year general education and professional writing instructor in rhetoric and composition teaching classes of 20–25 students. In these courses, I was never surprised to see the same three or four students raising their hands to participate in discussion during every class. As a general education requirement, the course did not appeal to many of the students; they adopted a mentality of "completing the requirement," rather than "engaging in learning."

Currently, I teach a class on pedagogy to science, technology, engineering, and mathematics (STEM) students who want to be learning assistants (LAs; undergraduate teaching assistants). This one-credit course meets for 75 min, once a week, for 7 weeks. The classes range from 15 to 35 students in each section, and I typically teach three sections each semester (two in person, one asynchronous

online). These students have chosen to be an LA, knowing that my course is a required part of their educational preparation for the job—one step better than the required general education courses that I used to teach. Given their motivation to be an LA, I assumed it would be less of a struggle to encourage participation during in-class discussions. This was not the case. As in my writing courses, the same three or four students continued to answer questions during every class. Throughout my years of teaching, I have wondered why students resist engaging in class discussion, but when I began researching the literature on this topic the reasons became clear.

Engagement, Inclusion, and Belonging

My review of the literature was originally focused on student engagement. I wanted to make sure that I was engaging all students during class, not just some of them. However, the more I read, applied to my own teaching, revised, tested, and tried again, the more I realized that my questions and concerns were about much more than just engagement. They were about inclusion and belonging as well. On the surface, these three ideas look similar in the context of education—they are all concerned with how students interact with their learning environment (Mulvey et al., 2022; Pope & Miles, 2022). However, just because students are engaged does not mean they feel included, and feelings of inclusion do not always lead to feeling as though you belong (Fernandes, 2021; Hanover Research, 2022; Kurfist, 2022; Verlinden, 2022). For example, a student might feel comfortable engaging in a course activity but still feel as if some aspect of their identity keeps them separate from other students in the class. In the same way, a student might feel both engaged and included but might not feel connected to anyone else in the classroom; in other words, they might not feel as if they belong as a full participant in the learning community.

Inclusion in the classroom is well documented in the literature. Hogan and Sathy (2022) defined classroom inclusion as “a culture in which all learners feel welcome, valued, and safe, and it requires intentional and deliberate strategies” (p. 5). The terms “welcome” and “safety” are present in most definitions of inclusive learning environments (Addy, 2021; Cook-Sather et al., 2021; Gamrat, 2022). My goal has always been to create engaging and inclusive classroom environments, as these are generally things that I can plan for and control. They can be implemented through pedagogically sound and thoroughly researched teaching practices. However, creating learning environments where students feel as if they *belong* is more complicated.

There is some consensus on what constitutes a “feeling of belonging” in higher education and how it impacts student learning and performance. Strayhorn (2019), who has written extensively on belonging among college students, said that it is “a feeling of connectedness, that one is important or matters to others” and is a “function of perceived support from one’s peers, teachers, and family members” (p. 2). Walton and Cohen (2011) called it “a sense of having positive relationships with others” (p. 1447), and their influential study on belonging among 1st-year college students showed improvements in performance and well-being after a brief belonging intervention. There are also some key types of activities that are important to feelings of belonging, such as “helping students develop relationships with people whom they can go to when they feel disconnected, activities that encourage interactions among students from different backgrounds, and events about important social, economic, or political issues” (Lu, 2023, para. 26). A national study of more than 20,000 students at 2 and 4-year colleges found that feelings of belonging had positive impacts on persistence and mental health; however, the study also found that underrepresented first-generation, racial, and ethnic minority students at 4-year institutions reported a lower sense of belonging than their peers (Gopalan & Brady, 2020).

Despite these different definitions for engagement, inclusion, and belonging, these three concepts are inextricably linked when it comes to their impact in the classroom. Studies have

repeatedly shown that student perceptions and feelings in these three areas have a direct impact on each other. For example, McWhirter and Cinamon (2021) found links between inclusion/belonging and engagement and retention in STEM fields; Mulvey et al. (2022) discovered significant relationships between higher levels of inclusion and belonging with engagement both in and out of the classroom; and Wilson et al. (2015) found that “among five universities and colleges studied, significant links between multiple measures of belonging and multiple measures of both behavioral and emotional engagement are numerous and varied, even when controlling for other known and significant correlates to engagement such as self-efficacy” (p. 768). This research led me to believe that gains in both engagement and inclusion would also have a positive impact on belonging in the classroom. Additionally, my examination of the literature led me to theorize that a UDL approach could address all three of these important aspects of student success.

UDL, Belonging, and Educational Technologies

Addressing these three areas of engagement, inclusion, and belonging were what initially led me to explore the UDL approach that I eventually adopted in my teaching. There is noticeable overlap in how the literature defines a sense of belonging in higher education and how the UDL framework conceptualizes choice in the classroom. The UDL guidelines emphasize the importance of “foster[ing] collaboration and community” through creating varied peer learning opportunities, creating groups according to shared interests and activities, and scaffolding instruction on how and when to ask others for help (CAST, 2021). The UDL framework also “recognizes learner variability as an educational norm” and strives to treat students as individuals with differences (Fornauf & Erickson, n.d., p. 185). By emphasizing choice, instructors invite students to cocreate their learning experiences, thereby cultivating an environment where the connections to others that foster feelings of belonging are more likely to occur.

Additionally, there is a clear link in the literature between the UDL framework and the use of educational technologies. Edyburn (2011) presented numerous examples of how offering choice in the classroom through teaching with a variety of pedagogically tested educational technologies can increase student access to content, enhance engagement, and have a greater impact on diverse learners. Similarly, Basham et al. (2020) argued that the “UDL framework along with the integration of modern technology begins to provide a proactive mechanism to account for learner variability and maximizes student learning” (p. 73). Whereas access to specific technologies can be limited by institutional budgets, many UDL options can be provided using free educational technologies that require no more than access to a device, an internet browser, and an internet connection.

Barriers to Discussion Participation

One of the main ways that I hoped to increase belonging in the classroom through educational technologies was by looking for technologies that would connect students during class discussion. This was my original teaching question that drove me to research the literature in this area. Educational researchers have been investigating student participation in class discussion for decades. The reasons for lack of participation are varied: Some students are naturally quiet and introverted (Medaille & Usinger, 2019); some students do not view their ideas as worthy of sharing (Wade, 1994); some fear they will make a mistake in front of their instructor and peers (Engin, 2017); others experience barriers due to mental health issues or disability status (Marquis et al., 2016); still others are multilingual learners who, although perhaps confident in their ideas, may not be confident in their ability to express those ideas in the dominant language of the classroom (Chew & Ng, 2015; Jackson & Chen, 2018; Yazici & Bavli, 2022). Classes that rely heavily on discussion-based learning may privilege extroverted, outgoing

students who are part of the dominant cultural group and already feel as if they belong on the 1st day of class (Blau & Barak, 2012; Blau et al., 2017; Chew & Ng, 2015, 2016).

Without intentional intervention, research has shown that participation in classroom discussion (whether as part of a whole-class discussion or smaller group discussion) can be stressful for a variety of reasons (Demissie, 2020; Ozment, 2018). Simply asking a question and expecting more than a handful of students to volunteer to answer will not offer an equitable way for all students to participate in class discussion. As I learned more about the scope of student barriers to class participation, I brainstormed other ways that I could encourage students to participate without triggering this anxiety, as there is no way for students to feel engaged, included, or as though they belong if they are anxious or nervous. Most of my ideas involved different types of educational technologies.

Barriers to Other Types of Academic Participation

Once I began investigating the root causes of the lack of discussion-based participation in my classes, I naturally started thinking about other ways my students engage with me, with other students, and with course content. If the style of discussion privileged some students over others, was it possible that I was unintentionally placing students at a disadvantage in other aspects of my course?

At the heart of the UDL approach is student choice (CAST, 2021). UDL is a conceptual framework with foundations in neuroscience that emphasizes designing learning experiences to “incorporate multiple means of engaging with content and people, representing information, and expressing skills and knowledge” (Tobin & Behling, 2018, p. 2). It looks at every aspect of the classroom (content, engagement, and assessment) and asks the same questions I was asking about class discussions: How am I privileging some students over others in the way I present materials? In formative and summative assessments? In all forms of course engagement? And if I am privileging some students over others, is there any way that all of my students can feel as though they belong? As I continued reading and learning about the UDL approach, I questioned every aspect of my course and examined it to see if I was designing learning experiences that worked for all my students. Ultimately, I decided to revise my course using a combination of UDL concepts and several educational technologies to try and address all of these questions.

Case Study Context: UDL Revisions and Technologies

With the overlap of UDL concepts, educational technologies, and the previously cited literature in mind, I wanted to revise my course to offer as much choice as possible by following the UDL framework, and I knew that I would need to incorporate a variety of educational technologies to make these revisions work. My overall goal was to increase engagement and feelings of belonging and inclusivity in my students. I focused on the three areas of the UDL framework: revisions to (1) engagement, (2) representation, and (3) action and expression (CAST, 2021). Many of my revisions involved adding or changing instructional technologies to facilitate the additional student choices, and these technologies were key to making these revisions successful.

Revisions to Engagement

The first area I revised was student engagement, as it was my original impetus for researching the changes to my curriculum. The UDL framework presents engagement in a very specific way; it promotes ways to “connect with student interests...[and] provide multiple methods of engaging with materials” (Tobin & Behling, 2018, pp. 25–26). Engagement should offer choice and make learning

relevant for all students (Posey, n.d.). In my teaching context, engagement fell into three categories: class discussion, office hours, and weekly check-ins.

Class discussion needed to include ways for students to engage and participate without feeling anxious and had to offer more time to think than is typical in traditional classroom settings. Originally, I used a free online tool called Padlet, a digital space where students can participate in a visual discussion using “cards,” similar to adding a post-it note to a physical bulletin board. I included each of my discussion questions as a card, and students could respond to those cards anonymously to answer any of the questions or simply raise their hands to answer if they preferred. First, I would call on students who wanted to speak during class to give other students time to type, then I would discuss the anonymous written responses with the class. This is simple enough that it can be done using any online collaborative tool that allows for students to participate anonymously (other options include Google Jamboard, Word Online, or any other collaborative note-taking tool).

Ultimately, I landed on a tool called Top Hat, which my institution has a license for. This interactive presentation tool integrated my uploaded slides with a variety of polls and discussion questions that have options for anonymous participation. Students use Top Hat to log in to the instructor’s class presentation, so while I presented my slides, they could follow along on their own devices. Whenever I initiated a poll or discussion question, the question would also pop up on their devices so that it was immediately accessible for them to answer.

Another engagement change I made to my teaching was to require two office-hours visits with either me or one of my own LAs throughout the semester. I have done this in previous classes, but this was the first time I considered office-hours options outside of in-person drop-in hours. I added choice by offering multiple options for how students could meet with us: They could come to regularly scheduled drop-in hours (either in person or on Zoom), or they could schedule time for in-person or online appointments as well. This was one of the areas where I hoped to see improvements in belonging, as developing positive relationships is one of the key aspects of cultivating feelings of belonging.

It is important for me to check in with my students each week, as one of the objectives of my course is to provide support for students in their first semester as an LA. For these weekly check-ins, students who attended class in person could share how their week was going by either raising their hand to talk or typing into a Top Hat discussion at the beginning of each class. If a student missed class or was part of my asynchronous section, they could complete their check-in within the learning management system (LMS) by filming a brief (3- to 4-min) video using a tool called VoiceThread, which allowed me to respond to their videos with a video of my own. This enabled me to provide feedback, answer questions, and address concerns even when a student was not physically present in class. This type of video check-in and response could be done using a video submission tool in an assignment or discussion forum in the LMS as well. This was another area where I hoped to see increased feelings of belonging, as both the LAs working in my classes and I were intentional about responding to every in-person and asynchronous check-in.

Revisions to Representation

The next area for revisions was representation. The UDL framework offers suggestions for presenting all types of course content in multiple ways and in multiple forms—in other words, representing materials in a variety of ways to account for learner variability (Tobin & Behling, 2018, p. 25). This can take the form of offering both a printed and online version of a textbook, creating lecture videos, or letting students join lectures via Zoom. One of the big changes I made to my course was to offer alternative ways for students to access course materials if they could not be physically present in class for any reason. I made attendance “mandatory,” but students could either come to class in person or

complete asynchronous tasks that would fulfill the attendance requirement. This alternative attendance included participating in the weekly check-in (mentioned in the previous section), viewing a prerecorded lecture video with discussion questions (the same questions that I ask during in-person classes), and completing a revised version of the in-class assignment that students could do on their own. The prerecorded lecture videos were created in Zoom and uploaded to Kaltura, where I used the automatic closed-captioning feature to add captions and transcripts as an additional option for accessing the materials. The videos were then embedded into either the LMS or Top Hat (we tried both; ultimately using the LMS worked better). This alternative attendance option was available for every lesson, so students could attend the class completely asynchronously and still have access to all the same content as the students who attended class in person. Because I also teach an asynchronous section of this course each semester, I was able to use already created materials across all sections of the course (both in-person and online).

Although these changes meant that physical attendance was not strictly necessary, most students enrolled in the in-person sections still chose to physically attend class. Also, even though there was a slight uptick in absences (one or two more per class), previously those students would simply have missed out on that content. By offering this alternative way to “attend,” students always had access to content missed in class and could easily make up any assignments they missed. The largest difference between the in-person and asynchronous sections (and, by extension, in-person students who completed the content of lessons online after being absent) was less student-to-student engagement.

Revisions to Action and Expression

The final area for revisions was in action and expression, or the ways students demonstrate their learning. The UDL framework suggests offering students choice in this area, such as by providing flexible submission options and types (Posey, n.d.). The assessments in the class were all designed as writing assignments, where students would apply the ideas from the course to their own work as an LA and support those ideas with references to our course readings. As a former writing teacher, I recognize the value of students practicing their written communication skills. However, this is not a writing course, and I do not believe that it is necessary to make written communication a graded part of my assignments. Therefore, students could submit their assignments in any format they preferred as long as they followed the assignment instructions. This resulted in alternative submissions that included PowerPoint slides, voice-over PowerPoints, video submissions, audio submissions, outlines, and even—in one notable case—a dramatic skit in which the student acted out his submission with the help of his roommate. To ensure all students felt comfortable with these alternative forms of submission, I included examples of such assignment types from previous semesters. Although it may seem as if the addition of these multiple modes of submission would make assessing learning more complicated, I created a rubric that emphasized the ideas and concepts discussed and how well students addressed the prompts of the assignment, regardless of the genre of submission.

Additionally, I offered flexibility with assignment due dates. Students could submit a form up to five times each semester to receive a 1-week extension on any assignment for any reason (they did not need to provide the reason). This could help with a variety of student issues: illness, family emergencies, travel, events with clubs or activities, mental health issues, or a heavy workload in other classes. This also sounds as if it would greatly increase the amount of time I spent on record keeping; however, this ended up saving me time as I rarely had to field student questions either in person or via email about whether absences could be excused, if they could turn in assignments late for full credit, or if they would be graded on grammar in addition to their ideas.

Purpose of the Qualitative Case Study

The purpose of this research was to examine my students' experiences of the changes to my course, specifically related to engagement, inclusivity, and belonging. Ultimately, I hoped to determine whether the UDL structure and educational technologies used would have a positive impact on my students' experiences in the classroom relating to my concerns. I based my study on the following research questions:

- How does the UDL structure of my course impact student experience, engagement, and feelings of inclusion and belonging?
- How do the educational technologies used in the course impact student experience, engagement, and feelings of inclusion and belonging?

Methods

To gauge the effectiveness of the UDL revisions, I designed a qualitative case study to address my research questions. I designed this case study using a pragmatic stance, which emphasizes the resolution of practical, real-world problems (Biesta & Burbules, 2003). In the context of my own class, these problems were student barriers to discussion-based participation, uneven engagement with course materials, and inequity in representing their knowledge. Following my pragmatic approach, I chose methods best suited to evaluating the revisions to my course that addressed these problems (Kaushik & Walsh, 2019). These methods included interviews, surveys, written reflections, and observations, which generated data that provided insights into student experiences related to the course revisions.

The case study utilized an embedded case design as described by Yin (2017), in which the same intervention is examined across multiple related cases within the same context. I collected data over two semesters and six sections (four in-person, two asynchronous) of my course, which allowed me to test my revisions with multiple groups of students and ensure that the outcomes would not be unique to any one set of students.

Researcher Positionality and Participant Context

It is important to note that I was both the instructor of record and sole researcher for these courses and therefore cannot be completely objective regarding the findings of this case study. There was also a power differential at play due to my position as an authority in the classroom. I tried to mitigate this power differential by making research participation anonymous and voluntary. I provided a small amount of extra credit points on one assignment for any student who wanted to participate in the research, but I also offered alternative ways for students who did not want to participate to complete the survey (also anonymously). Because I was the sole researcher, my perspective was the only lens through which the data were analyzed. In the future, I could include a second researcher as part of the study to establish interrater reliability with my coding scheme.

Additionally, in my teaching context, students are intrinsically and/or extrinsically motivated to assist their peers and receive instruction on the UDL framework and many aspects of teaching and learning, which may skew the results when considering generalization. The coding scheme and themes in a non-LA course could modify (and perhaps expand) the findings. Finally, the students in each section of my course were from a particular set of identity characteristics and cultural groups. Although each section contained a different group of students characterized by their own set of identity

characteristics, follow-up studies with a broader range of identities could also modify (and perhaps expand) the findings.

Data Collection

Over two semesters, 44 students completed a 16-question survey (see Appendix 1) distributed via an anonymous link at the end of the semester to determine their experiences and perceptions of the UDL course changes and educational technologies used in the course. At the end of the survey, students could opt in to be contacted for a follow-up interview. So far, two students have participated in semistructured interviews that were conducted via Zoom and recorded with permission (see Appendix 2). I also included responses to my institution's end-of-semester Student Ratings of Teacher Effectiveness (SRTEs; see Appendix 3) to see if any responses provided information related to my research questions. Finally, I collected my own reflections on my teaching and student interactions both in and out of class.

Data Analysis

Once the surveys and interviews were complete, I transcribed the two interviews and input all student data into Nvivo qualitative coding software. After reading through the responses, I analyzed the data inductively and assigned open codes. Whereas some codes were pulled directly from language within open-ended questions and interview transcripts, other codes were categories based on my experiences and observations. These initial codes included "ability to choose," "multiple ways to submit," "flexibility," "anonymity," and "anxiety," as well as codes related to educational technologies: "Top Hat," "videos," and "alternate assignments." This process is shown in the first and second columns of Table 1. Then, I refined the codes, discarding those that were not related to my research questions, using axial coding methods. For example, "flexibility" was included under "ability to choose" and individual technologies were all included under "educational technologies," as seen in Column 3 of Table 1. Finally, in my third round of coding, I combined relevant codes into two major themes, illustrated in Column 4 of Table 1. This three-round coding process resulted in two themes from survey and interview data.

Table 1. Examples of the three-round qualitative coding process.

Example	Round 1: Open	Round 2: Axial	Round 3: Themes
"It was nice to know that if I did not want to type I could do a video or audio recording."	Video; educational technologies	Ability to choose	Ability to choose
"I feel that having multiple ways to ask/answer questions and make comments is the most important practice. This is because many students often feel too intimidated to attend office hours or approach the front of the classroom. Having the	Ability to choose; Top Hat	Ability to choose; educational technologies	Educational technologies

Example	Round 1: Open	Round 2: Axial	Round 3: Themes
ability to interact in potentially anonymous ways would make student questions much more open and inclusive.”			
“Flexible late penalties and extension forms seem most important to me because as a student having multiple assignments due within days of each other can be very stressful. Having an option to get an extension of even one of these assignments and knowing there's always a backup plan relieves my stress.”	Flexibility; anxiety	Ability to choose; anxiety	Ability to choose
“It helped lift the stress from needing to follow strict guidelines. I usually feel the need to compulsively check that my assignments are completed in an exact structure, so the freedom here was unique and felt reassuring.”	Anxiety; alternate assignments	Alternate assignments	Ability to choose

Additional insights came from reflections on the LAs and my interactions and experiences with students both inside and outside of the classroom, which I coded separately using the same methods. In my teaching reflections, after each class I recorded what went well, what could have gone better, and what I wanted to change in future iterations of the course. Additionally, I included notes on student interactions in and out of the classroom (particularly during office hours and other one-on-one conversations) and notes from weekly meetings with the LAs who work in my class. I coded the data using the same three-round process, which added an additional two themes to my data analysis for a total of four themes.

Findings

Student Responses: The Importance of the Ability to Choose

Throughout the survey, comments on the ability to choose were woven into more than 60 open-ended responses. When asked what aspects of the course structure to keep in future iterations of the course, 20 students offered open-ended feedback on the options available. These findings were mostly related to student engagement and inclusion, which were addressed by this aspect of the UDL revisions of

the course. Some students connected the options to the content: “The content was interesting and helpful, and I liked the options that we had.” Other students really liked the options for submitting assignments: “Multiple submission abilities. It made it so fun completing assignments.” Interestingly, two students commented that they never used any of the alternative options but appreciated that they were available if they needed them: “I did not use these [alternative] options, but knowing I had the option to go a more creative way felt very inclusive.” These comments are representative of many others; open-ended feedback was consistently positive across any question focused on the variety of options available to them as part of the course.

A common subtheme was that the multiple options made students feel welcomed, included, and less anxious in the class. This idea was threaded through responses to multiple different questions. The words “welcome,” “included,” “comfortable,” or “safe” appeared 24 times in the responses, and the various choices were mentioned when talking about relieving anxiety and stress 16 times. These responses often included references to people in the class, not just the UDL structure of the course. Some students talked specifically about me as the instructor. One student remarked, “Ms. Fleming is very welcoming, understanding, and flexible with her students.” Another similarly wrote, “Prof. Fleming is very inviting and welcoming. She created a very safe judgement free environment.” One more commented, “I am so fortunate for having to take this course. Ms. Fleming did an amazing job and I genuinely liked coming to class every week.” Students also commented on the teaching team (me and the class LAs). One wrote, “I felt like the teaching team wanted me to succeed and didn't put unrealistic pressure on their students.” Another mentioned that “the teaching staff was very nice.” There were no questions on the survey that asked about me or my LAs; these comments were made without prompting.

Student Responses: The Impact of Educational Technologies

Students had a lot to say about how educational technologies were utilized in the course, and many of their comments were about how those technologies were used to offer choice and improve both engagement and inclusion. The most popular technology used in the class was Top Hat for answering questions anonymously, but students took advantage of many of the educational technologies in the course:

- 88% of students indicated that backchannel chat in Top Hat made them more likely to participate in class discussions
- 36% of students said that they viewed class recordings to remind themselves of what happened during class at least once during the semester
- 61% of students said they viewed class recordings to replace attending class at least once during the semester
- 34% of students said that they submitted at least one assignment in a “nontraditional” format (e.g., a slide deck, outline, video or audio recording, etc.)

In addition to asking how students took advantage of the choices offered by educational technologies, I also asked about which they would be most likely to use (or suggest to their instructor) in their own work as learning assistants. In response, 82% chose “multiple ways to ask/answer questions and make comments” (using Top Hat) as a practice they would consider implementing into their own work as LAs. When asked why, 11 students included open-ended comments with explanations. Comments were similar regarding why they thought this practice was important. One student connected this practice with inclusivity:

I feel that having multiple ways to ask/answer questions and make comments is the most important practice. This is because many students often feel too intimidated to attend office hours or approach the front of the classroom. Having the ability to interact in potentially anonymous ways would make student questions much more open and inclusive.

Another student thought about the implications for active learning: “Multiple ways to ask questions because I want to promote an active learning environment.” And another just wanted students to feel comfortable: “I feel the multiple ways to ask questions feature is the most beneficial to students because this ensures that every student is able to express their concerns in a way that makes them comfortable.”

The second most chosen practice, which 46% of students would consider including in their own work as LAs, was required office hours with in-person, Zoom, scheduled, and drop-in options. There were nine open-ended responses on this topic. One student suggested that office hours help them know if a student is struggling: “I like the idea of required office hours. I think with the web class I am in now where the LA’s aren’t available after class, it can be hard to know when a student is really struggling or not so that idea for web classes is a great idea.” Another student saw it as an area for connection, writing, “I would like [to use office hours] to connect with the students more.” And finally, one student suggested that office hours would be beneficial even if a student does not need help with course content: “I think requiring office hours can be helpful for students because people don’t usually know everything. Even if someone has not lost a single point the whole semester, I think that just going can help, even if it is not related to the course material.”

Instructor Observations: Increased Participation and Engagement

When coding my own class and student interaction notes, a prevalent theme that emerged was increased student participation and engagement as a result of the UDL revisions to the course. Over two semesters of notes, I made comments related to this theme 14 times. The subtheme I commented on the most was discussion responses using the anonymous Top Hat chat. At one point in early spring 2023, I wrote: “Last year at this time I was lucky if 3-4 students were raising their hands each class period. This semester, most students are answering EVERY QUESTION. I think it might be around 90% participation on every single discussion question I ask during class.” At another point in my notes, I commented:

I started picking out one or two anonymous responses to each Top Hat question and asking if the poster would be willing to expand on their comment or offer further clarification. In the past two weeks, every time I have asked except for one time the student was willing to become “un-anonymous” and add additional context to their response. Sometimes, this even means that students talk to EACH OTHER!

The rest of the notes related to this theme included similar ideas, documenting my observations of student participation during in-class discussion.

Instructor Observations: Belonging

Although I did not use the word “belonging” in my notes, many of my comments indicated increased levels of student connection with me and my LAs compared to previous semesters. These comments—which appeared 35 times in my notes—were all centered on student interactions outside

of class (before/after class or during office hours). When coding this category, I kept in mind the definitions of belonging mentioned previously: I looked for evidence of connection, perceived support, and students coming to the teaching team to talk about issues other than class content (Lu, 2023; Strayhorn, 2019; Walton & Cohen, 2011). My notes included the following numbers:

- four students who came to me with requests, questions, or concerns about graduate school applications
- three students who had questions about other areas of university life that had nothing to do with my class
- six students who wanted to tell me more about their personal lives and home cultures
- four students who showed up to my drop-in office hours “just to talk”
- six instances where my LAs noted students either seeking them out more often than they had in the past or coming to them with questions about content not related to the course

Additionally, over the past year, seven students came to me with sensitive issues and problems involving their LA assignments that I was able to either help them navigate on their own or elevate to someone higher in administration who could address the problem.

One final area where I found indications of belonging was in the asynchronous student check-ins. During office-hours conversations, five students mentioned that they enjoyed the opportunity to check in, report on their work as an LA, ask questions, and discuss areas for improvement since they could not be physically present in class to discuss these issues. All five also commented that they appreciated the individual responses from the teaching team.

Discussion and Implications

My examination of student data and my own observations were guided by my research questions, which asked how the technology-supported UDL structure of the course might impact student experience, engagement, and feelings of inclusion and belonging. The data indicate that all four of these important aspects of student success were positively impacted by the revisions to my course.

Student Experience

One of the first things I was interested in studying when I implemented the UDL revisions to my course was my students’ experiences. I was pleased to find that the overall student feedback on the UDL revisions to my course and educational technologies I added was overwhelmingly positive. Of all student feedback across both my surveys and my SRTes, there were only three negative comments about any aspect of the course, and none of those three comments related to the UDL framework or technologies (all three were about course workload). This indicates that, overall, student experiences of these course revisions were positive.

Engagement and Inclusion

Engagement was where the inquiry into my teaching practices began, and I observed increased engagement in multiple areas of the course revision: discussion, office hours, and check-ins. I was most surprised by both observed changes and student response to class discussion. I anticipated some increased engagement during discussion, but the degree of that increase was unexpected. The types of questions I was asking and the complexity or sensitivity of the topics did not change; the only change

was in the offering of options (traditional “raise hand to answer” or type anonymously in Top Hat). My observations and student feedback support the idea that both the options (based on the UDL framework) and the educational technology used (Top Hat) were responsible for increased engagement in this area. This is in line with the previously cited literature on barriers to discussion participation (Demissie, 2020; Ozment, 2018); the anonymous format of the online discussion responses allowed for all students—regardless of confidence, anxiety, English language proficiency, or personality type—to participate fully and equitably in class discussion. Additionally, more students felt comfortable speaking out loud in class as a result of positive feedback to their anonymous posts online. As mentioned earlier, when I asked for specific anonymous posters to elaborate, comment on, or answer a question about a post, most of the time the student would speak up to claim their post and add to it. This meant that more voices (not just words and ideas on the screen) were engaged in class discussion.

This level of engagement is also an indicator of feelings of inclusion: Students need to feel both welcome and safe to participate in class discussion. Additionally, since most definitions of inclusion involve feelings of welcome and safety (Addy, 2021; Cook-Sather et al., 2021; Gamrat, 2022), that those words (plus “included” and “comfortable”) appeared in so many student responses indicates that multiple areas of the course revision positively impacted student inclusion.

Belonging

Since my students did not have a common definition for belonging in the classroom, I worried that it would be difficult to determine whether the UDL revisions and technologies impacted feelings of belonging in the classroom. However, I found plenty of evidence of increased feelings of belonging in both student responses and my own observations, particularly when considering the most common definitions for student belonging found in the literature: that belonging is closely tied to connection, support, positive relationships, and feeling as though one has someone to go to when one needs help or feels disconnected (Lu, 2023; Strayhorn, 2019; Walton & Cohen, 2011). There were two main areas where I saw this occurring: my own experiences meeting with students one-on-one both inside and outside of the classroom, and student interest in required office hours.

As previously mentioned, I required students to attend office hours in previous classes. However, the number of students who scheduled or dropped in to my office hours ready to discuss specific things unrelated to the coursework in my class shocked me. Although I feel that my teaching has improved over the years, I do not believe that it has improved so much as to account for this increase; therefore, the UDL structure and technologies implemented are likely to have been contributing factors. I believe that the UDL revisions and educational technologies added did more than just change my course: They signaled that I cared about my students and their learning. As a result, more than in any previous year of teaching, I was able to help students navigate complex university processes, review graduate school personal statements, and assess resumes for internships. Despite teaching a one-credit course that meets only once a week for 7 weeks, I was asked to be a reference or write a recommendation eight times in the past year—sometimes over other faculty members of three-credit, discipline-specific courses where they spent far more time. This is in line with what I see as one of the most important aspects of belonging: Students felt comfortable with and connected to me enough that they saw me as someone they could trust to help them when needed (Lu, 2023).

Even more exciting for me was the student feedback on why they believed required office hours would benefit the students in the course where they are an LA. Again, even though students were not explicitly given a definition of belonging, that three of the nine open-ended comments included aspects of student belonging is encouraging. This indicates that the structure of my course

and the technologies I implemented did more than just increase belonging in my students; they also had an impact on how my students planned to interact with their own students in the future.

Application in Other Courses

Although the revisions I made to my course were tailored to my specific teaching context, anyone teaching in any discipline could adopt some or all these practices in their own courses. Some would need to be adapted or abandoned in certain contexts (e.g., larger enrollment courses, assignments that require a specific type of submission, limited or lack of availability of technologies, etc.). However, I believe that students in any course would benefit from adding even one additional choice to one assignment or pedagogical practice, and there are plenty of free technologies that could be substituted. Any of these practices have the potential to benefit student engagement, inclusion, and belonging. This less comprehensive type of course revision is supported by the literature; research has indicated that the “plus-one” approach to implementing the UDL framework can positively impact student retention, satisfaction, and motivation in the classroom (Tobin & Behling, 2018). Table 2 summarizes the revisions made and educational technologies used in my course related to each principle of the UDL framework.

Table 2. UDL revisions, educational technologies used, and alternative technology options.

UDL principle	Revision	Technology used	Alternative technology option
Providing multiple means of engagement	Synchronous anonymous discussion; required office hours with multiple options for meeting; virtual check-ins for students not physically present in class	Top Hat; Zoom; VoiceThread; Canvas LMS	Padlet; Google Jamboard; Google Docs; Microsoft Teams; Google Meet; video assignment in any LMS, instructor video responses
Providing multiple means of representation	“Mandatory” attendance with options for asynchronous participation	Zoom, Kaltura, closed captions, and transcript	Record using any video recording app (even your phone!), post to LMS or YouTube using their auto-caption feature
Providing multiple means of action and expression	Flexible assignment submissions; flexible due dates	PowerPoint; Google Slides; YouTube; cell phone recording apps; Kaltura; Zoom; Adobe Premiere Pro (and many more); Google Forms	Any free or institution-supported technology—let students get creative! Survey Monkey; Microsoft Forms

Note. LMS = Learning management system; UDL = universal design for learning.

Future Directions and Conclusion

Researchers have studied how the UDL framework impacts diversity, equity, and inclusion (Burgstahler, 2020; Dalton et al., 2019; Edyburn, 2011; Fitzgerald, 2020; Takemae, 2022), but there is more to be studied regarding how this framework has an impact on belonging in the classroom. Some or all the technologies and pedagogical strategies based on UDL in the classroom that were utilized in this case study could be implemented in other classrooms regardless of discipline, but future research is needed to determine students' personal experiences of belonging when they have a shared definition of the term. In future iterations of my course, I plan to incorporate definitions of engagement, inclusion, and belonging into the curriculum, and I will add a more targeted question to student surveys to gain better insights into how students experience these feelings as a result of the UDL structure of my course. I will also differentiate between in-person and asynchronous students when evaluating survey results to see if there are differences in student experiences based on course modality.

This case study provides one example of how choice and flexibility in the classroom can have a positive impact on student experience, engagement, and feelings of inclusion and belonging. Choice and flexibility were incredibly important, but none of the revisions would have been possible without numerous educational technologies. Although the research presented here is promising, I hope that more faculty who utilize a technology-supported UDL approach will examine and report on how it impacts student belonging in their classes.

Appendix

Appendix 1. Survey Questions

1. How many IST 389 classes did you attend in person during the Spring 2022 semester?
[Response was on a slider bar numbered from 0 to 7]
2. To what degree did you utilize the following virtual attendance options within the course?
 - a. Viewing class recordings to replace attending class [Response options: every week, at least once every two weeks, 1-2 times during the semester, never]
 - b. Viewing class recordings to remind myself what happened in class [Response options: every week, at least once every two weeks, 1-2 times during the semester, never]
3. To what degree did you utilize the following engagement and assignment options within the course?
 - a. Top Hat class chat for anything other than pre-class questions [Response options: every week, at least once every two weeks, 1-2 times during the semester, never, not applicable – asynchronous student]
 - b. Submitting assignments in any format other than a written submission [Response options: every week, at least once every two weeks, 1-2 times during the semester, never, not applicable – asynchronous student]
 - c. Submitting any part of the Capstone Assignment in any format other than a written submission [Response options: every week, at least once every two weeks, 1-2 times during the semester, never, not applicable – asynchronous student]
 - d. Contacting the instructor to receive an extension on an assignment [Response options: every week, at least once every two weeks, 1-2 times during the semester, never, not applicable – asynchronous student]

- e. Turning in an assignment late [Response options: every week, at least once every two weeks, 1-2 times during the semester, never, not applicable – asynchronous student]
 4. Did you appreciate the variety of options available for submitting assignments in this course? [Response options: yes or no]
 5. Why or why not? [Open ended]
 6. If you attended class in person, did the availability of the Top Hat chat make you more likely to participate in class discussions? [Response options: yes, no, I participated in class asynchronously]
 7. Why or why not? (if you are an asynchronous student, write "asynchronous" below) [Open ended]
 8. How would you rate your overall experience in this course? [Response options: very positive, somewhat positive, somewhat negative, very negative]
 9. Why did you choose that experience rating? [Open ended]
 10. Are there any specific aspects of this course that you believe the instructors should **continue** including in the course for future students? [Open ended]
 11. Are there any aspects of this course that the instructors should **change** for future students? [Open ended]
 12. Consider the following elements of IST 389. Which of these do you imagine you might use in your work as a learning assistant? Check all that apply. [Response options below]
 - a. Multiple ways to complete/submit assignments (i.e., submissions as text, PowerPoint, audio, video, outline, etc.)
 - b. Multiple ways to ask/answer questions and make comments (i.e., raise hand to talk and type in Top Hat)
 - c. No attendance policy
 - d. Flexible late penalties/form to request extension
 - e. Required office hours
 13. Of the elements you chose, which feels most important to your practices as an LA and why? [Open ended]
 14. Which of these elements might you suggest to your instructor as an option for the class where you are an LA? Check all that apply. [Response options below]
 - a. Multiple ways to complete/submit assignments (i.e., submissions as text, PowerPoint, audio, video, outline, etc.)
 - b. Multiple ways to ask/answer questions and make comments (i.e., raise hand to talk and type in Top Hat)
 - c. No attendance policy
 - d. Flexible late penalties/form to request extension
 - e. Required office hours
- Questions 15 and 16 were added in the second semester of data collection.
15. Did the elements of the course in the previous question increase your sense of inclusion and/or belonging in the course? [Response options: yes or no]
 16. Why or why not? [Open ended]

Appendix 2. Interview Questions

1. Do you think student choice—offering multiple options to students—in learning is important? Why or why not?
2. [Show list of UDL choices in IST 389] As a student, what specific choices did you appreciate most in IST 389? Why?

3. If given the opportunity, what choices in the class might you suggest to the instructor in the course where you are an LA? Why?
4. Is your experience as a student different than your expectations as a teacher? If so, why?
5. Is there anything about how IST 389 is structured that you have applied to your own work as an LA? Why? If not, is there anything you might apply in the future?
6. We learned about both UDL and becoming an inclusive learning assistant in class [check in to make sure they remember these lessons before proceeding; offer short summary if not]. Do you think there is a connection between UDL and inclusivity in the classroom? Why or why not?

Appendix 3. Student Rating of Teacher Effectiveness Questions

1. Are you taking this course as an elective? [Response options: yes, no, I don't know]
2. What grade do you expect to earn in this course? [Response options: A, B, C or lower]
3. Rate how well this course increased your understanding of the course topics. [Response options: numbers 1–7 with 1 being the lowest rating, 4 being the average rating, and 7 being the highest rating]
4. Rate how well the instructor promoted a meaningful learning experience for you. [Response options: numbers 1–7 with 1 being the lowest rating, 4 being the average rating, and 7 being the highest rating]
5. What aspects of this course helped you learn? [Open ended]
6. What changes to this course could improve your learning? [Open ended]

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Ready, Set, Match: Helping Students Feel as if They Matter Through Virtual Events

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Abstract: As online education expands, cultivating a sense of belonging becomes increasingly complex, especially for students who may never set foot on a physical campus. In this article, we explore the nuanced nature of fostering a sense of belonging and mattering among distance learners on our own campus, Indiana University (IU) East. To address these students' unique needs, our English department organized three virtual events (the Alumni Career panel, the Faculty+Student Reading of creative work and the Celebration of Student Writing) utilizing Facebook Live, Zoom, and Pressbooks. Drawing on the concept of "belonging" as articulated by Strayhorn (2019), we examine the degree to which these virtual events fostered a sense of belonging and mattering, particularly through the concept of "matched pairs," which emerged as a useful framework for creating personalized connections between faculty and students, a critical ingredient in both belonging and mattering. Both the Faculty+Student Reading and the Celebration of Student Writing worked to establish closer ties between participating faculty and student pairs, while the third event, the Alumni Career Panel, encouraged students to interact with alumni in a virtual "living room," a relaxed online space (via Zoom) where they could learn about career paths. However, we also found that events like these cannot be viewed as "one-and-done" but rather must be part of a sustained program to enhance student connections. Acknowledging the time-intensive nature of planning and organizing such events, we caution against assumptions of seamless execution and underscore the need for purposeful planning, inclusive design, and flexibility to accommodate diverse student needs.

Keywords: Belonging, mattering, connection, validation, distance education students, online learning, virtual events, social identity, campus community, matched pairs

As the proportion of online students increases, the question of how to foster their sense of belonging becomes complicated, particularly when many of these students may never physically visit their home campus. The most recent census for our own campus, Indiana University (IU) East, revealed that 68% of all current students had no on-campus presence whatsoever (IU Institutional Analytics, personal communication, May 24, 2023). Many (if not most) work full-time or close to it and have a multitude of family and other obligations. Their need to feel a sense of belonging is not quite the same as that of more traditional (younger, in-person) students. In our own English studies program, this has been expressed in terms of desiring more connection or social interaction in which online, distance students can participate. For example, in a recent exit survey, student comments included a desire for faculty to better understand the differences between online and in-person students and adjust teaching/cocurricular interactions with their needs in mind, as well as a desire for more synchronous Zoom meetings in order to feel connected. This deeply resonates with us, as faculty, not just with respect to our individual teaching but with our overall approach to helping our online students feel as

if they belong—in our courses, in our program, and on our campus, even if they live on the other side of the country or just in a different time zone.

Strayhorn (2019) described “belonging” as “students’ perceived social support on campus, a feeling or sensation of connectedness, the experience of mattering or feeling cared about, accepted, respected, valued by, and important to the group,” related to feelings of acceptance, inclusion, importance and that one has a meaningful role to play (p. 27). A sense of belonging can result in a host of positive student outcomes, including improved mental health, greater use of campus resources, and a heightened determination to succeed; conversely, a lowered sense of belonging is linked to lower academic persistence (Brodie & Osowska, 2021; Gopalan & Brady, 2019; O’Keefe, 2013; Peacock et al., 2020). A sense of belonging is tied to a student’s perception of themselves as a “legitimate and valued member of a knowledge-building community” (Koole & Parchoma, 2012, p.15). This need is particularly acute for underrepresented, minority, and historically marginalized groups who have a higher propensity not to feel as if they belong (see Anderman & Freeman, 2004, as cited in Strayhorn, 2019, p. 20; Bettencourt, 2021; Gopalan & Brady, 2019). For these groups especially, personalized faculty attention can make, quite literally, a world of difference (O’Keefe, 2013).

Belonging is enmeshed with students’ social identities and is related to, though not identical with, a sense of mattering to peers, faculty, and other campus members (Potts, 2021; see also Tovar & Simon, 2010). Mattering is the belief that one is “significant and important to other people” (Flett et al., 2019, p. 667), that one is valued and appreciated (Schlossberg, 1989; Shine et al., 2021, p. 282). Rosenberg and McCullough (1981) defined it as “the feeling that others depend on us, are interested in us, are concerned with our fate” (as cited in Strayhorn, 2019, p. 151). Mattering is connected to a student’s perception of faculty attention, an awareness that faculty notice their presence and recognize their significance as people (Johnson et al., 2007). Again and again, it has been shown that the role of faculty is critical to fostering both belonging and mattering in students, a significance to which we will return.

Much of the research on belonging and mattering has focused more on traditional students in seated programs and less on those in online programs and who do not fit this profile (e.g., Ahn & Davis, 2020 Kirby & Thomas, 2022). As already mentioned, online students tend to work more hours and have greater home responsibilities and so are not necessarily in a position to participate in many of the kinds of activities that can heighten a feeling of belonging, such as clubs, student government, sports, and other endeavors that require at least some commitment of time and energy and contribute to what Ahn and Davis (2020) referred to as the “social domain” of belonging. At the same time, or perhaps because of this, many of these students do not feel impelled to develop a strong sense of belonging, as they have lives engaged in arenas outside of their campuses (Brodie & Osowska, 2021; Gravett & Ajjawi, 2022).

This is not to assume that online students do not desire *any* feeling of connection to their campuses; rather, it underscores how belonging as a phenomenon is not fixed or immutable but subject to a variety of influences (Allen et al., 2021). Indeed, it is deeply personal, bound up in a student’s understanding of themselves, “multifaceted, fluctuating and ephemeral in nature and differing for learners according to the context of their studies, individual needs and self-efficacy” (Peacock et al., 2020, p. 76). In fact, Gravett and Ajjawi (2022) suggested that belonging is a “nomadic process” that shifts as a student moves through their academic career, assessing and reassessing their personal situation and adjusting to educational, home, and work-life changes (p. 1393). Accordingly, Flett et al. (2019) noted the importance of keeping the student’s sense of individuality in mind and advocated for an increase in positive one-on-one encounters with faculty (p. 676), which aligns with our overall strategy in fostering a sense of belonging and mattering in our own students, as described further in this case study.

Employing Technology to Foster Belonging

Recently, our English department held three events spaced throughout the academic year, aimed at helping online students, in particular, feel as if they belonged. We employed three technologies: our campus's Facebook Live platform (for Event 1, Faculty+Student Reading); the online conferencing platform Zoom (for Event 2, English Alum Career Panel); and the e-book platform Pressbooks (for Event 3, Celebration of Student Writing). These apps let people connect over distance and time zones, synchronously and/or asynchronously, are both enduring and easily accessible, and create experiences that are both public and communal, yet they can also feel unexpectedly personal at the same time, as we will explain. The three events were also quite different from each other: The Faculty+Student Reading was the first of its kind to be held by our department and had a creative writing focus; the English Alum Career Panel had been held in prior years but in a campus-based format. Similarly, the third, Celebration of Student Writing, had been held since 2018, with participation by in-person students from across the campus but, up until the pandemic, in a mode that excluded distance students (which can contribute to feelings of isolation for online students; Thomas et al., 2014, p. 76). In all three events, our shift to online and digital access opened up involvement to all students, no matter where they lived or what their personal/professional situation. All were fairly low-threshold events in terms of time commitment or advance preparation (for students). That is, none of them asked students to do extra work, an important aspect when considering the needs of online students, who already tend to feel overstretched (Thomas et al., 2014). Two events involved student presentations and had a celebratory element (one of Boyer's, 1990, principles of campus community life) and the third involved alumni.

For the Faculty+Student Reading and the Celebration of Student Writing, the two celebratory events, our approach in obtaining student participation was on an individualized basis. Although this meant somewhat more involvement by individual faculty than might otherwise be needed in planning student events, quantitative and qualitative data suggested this was a highly effective component, as we elaborate below. Common to all three events, in various forms, was the idea of “matched pairs.” For both the Faculty+Student Reading and the Celebration of Student Writing, the matched pair was the faculty initiator and the student presenter; the English Alum Career Panel echoed the matched pairs theme by helping students feel a sense of identification with an alum who had been through the program and was now in a satisfying career, fostering a sense of “If they can do it, I can do it.” Following two of the events (English Alum Career Panel and Celebration of Student Writing), attendees completed surveys on the event's effect on students' sense of belonging and mattering.

Event 1: Faculty+Student Reading

The first event was scheduled early in the academic year. Three creative writing faculty each personally invited one student to join them in a public reading of a poem or prose excerpt, live streamed on our campus's Facebook Live page. The technology that allowed us to offer this event was Zoom, an easy-to-use synchronous conferencing application. The students were free to choose which of their works they wanted to read. Since this was the first time reading in public for some students, faculty also arranged to meet for one rehearsal via Zoom with their student; this was optional and inability to rehearse did not preclude a student from participating. In discussing validation, a concept closely related to mattering, Swanson and Cole (2022) found that when faculty take the initiative to reach out to a student in a publicly affirming way, as in the case here, it can lead to a range of positive results, both emotional and academic (p. 1369). In fact, validation as a concept rests on the idea of proactive steps taken by the validator, in this case, the faculty member, to foster the student's academic development and autonomy (Swanson & Cole, 2022; see also Barnett, 2011, who asserted a measurable

relationship between validation, as described here, and a student's sense of belonging). The event itself was limited to an hour and each student's name was paired with the faculty name on the program schedule.

To run the technical side of the event for us, we enlisted help from our campus marketing director. Asking for help from an experienced user, as we did, relieved a measure of stress from the faculty organizers, which included one of the authors (Perkins). To watch the event (and comment via text and emoticons), viewers simply went to our campus Facebook page—no special link or password needed. Student and faculty participants gathered virtually in the Zoom room 15 minutes prior to the start, which felt analogous to being backstage waiting for the curtain to rise. This short time offered a somewhat unexpectedly personal, even intimate, interlude where faculty and student participants alike could share feelings of nervousness and excitement; again, this created a feeling of collegiality and connection between students and faculty, only made possible through use of this particular live conferencing technology, since student participants were scattered across the state. Streaming Zoom via Facebook Live, however, created what were essentially two separate virtual “rooms”—the audience was on the Facebook side, separated from participants, who were on the Zoom side. This kind of separation has both advantages and drawbacks, which we discuss in further detail in the following section.

Although the audience attendance was modest (fewer than 20 attendees), the event still represented an opportunity for students to potentially experience both belonging and mattering; interestingly, the presence of opportunity itself is part of the belonging framework (Allen et al., 2021). This occurred in at least four ways: (1) social engagement with both faculty and peers, which occurred online via Zoom both before and after the live-streamed Facebook event; (2) personalized invitation from and one-on-one practice with a faculty member; (3) public recognition (by family, faculty, and peers) in a celebratory setting. A sense of mattering was further enhanced by positive comments and emoticons in the publicly visible chat, left by nonparticipating faculty attendees as well as family and friends (e.g., “So proud of you, X!” “Great reading, Y!”). This aspect of back-channel chat as public affirmation cannot be overlooked as a contribution to a sense of recognition for the student. In a 2021 study of help-seeking behaviors among online and blended learning students, Broadbent and Lodge (2021, Conclusion and implications) argued that live-chat technology enables online learners to feel “more cared about by the teaching team.” Other studies have found that instant messaging enhances a sense of connection (Klein et al., 2018; McInnerney & Roberts, 2004). Finally, (4) belonging and mattering occurred through validation of the student as a writer via the opportunity to share the virtual stage with their professor. In this regard, a public reading forum, as a collective experience, has an equalizing effect on participants; everyone is in the same boat, even if briefly (Allen et al., 2021).

We did not collect survey data from this event. However, students' personal expressions anecdotally attest to the positive effects and mostly align with the research findings discussed above. Student participants shared how being invited by a professor to join them in a public reading made them feel as if their writing had worth, that it mattered. They used words such as “excited” and “thrilled” in communication with faculty, and they invited (noncampus) friends and family to the event, some of whom attended. One of the faculty participants described the event as “transformational” in her observation of student effect (J.M. Blankenship, personal communication, July 26, 2023). Still, the question remains as to the longer term efficacy of an online event such as the Faculty+Student Reading.

The strength of the matched pair nature of the event is also its liability, since the number of students that can directly participate is limited by both the number of faculty available and the time span of the event itself. In future readings, faculty could each invite two or three students, which would expand opportunity for newer writers but also significantly lengthen the event's duration, which could negatively affect attendance. As well, there is some evidence suggesting that online events do

not have an impact or meaning for students enrolled in in-person programs and/or at residential institution (see, e.g., Potts, 2021). However, this might not necessarily be true for nontraditional, online students who have different personal and professional situations, as we have already elaborated. Our approach in creating the Faculty+Student Facebook Live event as part of the three-event series described in this case study was built on research suggesting that providing multiple *opportunities* for social interaction and participation with faculty and peers is helpful in and of itself for new students, but even more so when combined with personal faculty attention (Thomas et al., 2014). Moreover, we would suggest that events such as this need to be part of a larger quilt of purposeful faculty engagement with online students, whereby a sense of belonging (and mattering) can evolve organically over time. Kirby and Thomas (2022) noted that it is “*repeated* positive interactions with faculty members” (emphasis added) that are needed, not a one-and-done (p. 369).

Event 2: English Alum Career Panel

The Panel

For this event, select alumni were invited to talk about their postgraduation experiences via Zoom. The panel, held in late January, was required for all students in the Technical & Professional Writing Senior Seminar (either live on Zoom or watching the Zoom recording) and also available to all other English majors who wanted to attend. For those watching live, there was an opportunity to ask questions at the end. Prior to the pandemic, we held Career Panels on campus with a live-stream option; however, few of our students lived close enough to attend in person. In 2023, we decided to bring the Career Panel back but make it a virtual event. This made it accessible to both students and alumni, some of whom reside in other states, including Florida, California, and New York.

We carefully selected a diverse array of alumni who each had different career paths. Five alumni participated: a digital media writer; an SEO content supervisor; a digital editor for Disney working with e-books and audiobooks; a grant writer who owns her own grant-writing business; and an assistant acquisitions editor at a publishing company. They spoke for about 5 minutes each on their path since graduation, highlighting specific professional experiences. In addition, we invited a local professional in the communications field to talk to students about the job search process and what employers look for in job applicants. For convenience, this was prerecorded and aired during the panel. The presentation used a question-and-answer format with prompts to the speaker to talk about specific topics. All participants shared their contact information with the students so they could reach out, follow up, and connect with the presenters.

We decided to hold it via Zoom and not as a Facebook Live event. Both platforms have advantages; Facebook Live locates events within the visual interface of IU East's Facebook page, with its numerous links, images, and other media to reinforce campus personality/presence. Moreover, Facebook Live events are archived on the campus Facebook site, so that they can be watched anytime, even by non-campus-based viewers. However, for us, the primary disadvantage was that Facebook Live streaming created what was essentially two separate virtual “rooms,” as discussed earlier. For this particular event, we decided on Zoom for its “living room” environment, in which everyone can be seen, either with their cameras on or just by their names (offering a cameras-off option is important to make an online event inclusive; Cirucci, 2023).

In contrast to the Faculty+Student Reading, this event was not open to the public. We did not want to separate audience attendees, who would be primarily students, from participants, who were mostly alumni. Our hope was that the final question-and-answer period would turn into more of an open discussion between alumni and students. We also liked how Zoom made it easier for attendees to comment and communicate to the group as a whole, either by voice or via chat, which was enabled

for this event to encourage communication, as well as to individuals and that it would foster a sense of community and impel student participation (see Miller's 2020 essay on the particular affordances of the Zoom chat during synchronous online classes). The use of streaming technology also let us embed videos prepared by participants unable to attend in person. They prepared their videos in consultation with faculty and so the videos were timed in length and tailored in content to the particular needs of our students who made up the audience.

Survey Results

After watching the panel, Senior Seminar students, who attended as part of their coursework, were invited to complete anonymous surveys about the value of the panel, using a Likert scale measuring from strongly positive to strongly negative. The survey was completed by five students (more than a third of students enrolled in the seminar). All were fully online students. Students were also asked if they would be willing to share their reflection about the panel (a required component in the class) with the researchers. Two students agreed to do this. The results suggest that the Alum Career Panel event had a moderately positive effect on students' sense of belonging; however, the low participation rate constrains our ability to make any generalizable conclusions.

Survey responses indicate that the Career Panel was most helpful in supporting students' sense of connection with faculty ("After watching the English Majors Career Panel (either live or the recording), do you feel a stronger connection to faculty or your campus?" Yes: $n = 4$; maybe: $n = 1$), and less so with fellow students, including alumni ("After watching the English Majors Career Panel, do you feel a stronger connection to your fellow students (including alum)?" Yes: $n = 2$; maybe $n = 3$). One student commented: "I truly believe that our professors care for their students.... I'm glad to have ended up at IU East even if I'm purely online." This may reflect faculty interaction in inviting students to the event, as well as interactions prior to the event as everyone was entering the Zoom room and waiting for the event to begin. The time before and after events can be impactful in connecting with students; for this particular event, several faculty attended and greeted students by name as their icons appeared in the Zoom room. Although casual and brief, these kinds of interchanges can let students feel that they are seen; even "small nuances" such as remembering a student's name or other detail can have positive effects (Flett et al., 2019, p. 676). Students had the option to turn their cameras on or keep them off; most, though not all, kept them off. Although it may seem minor, recognizing and welcoming students, regardless of whether their camera is on or not, is important, especially for minority students and those with lower household incomes, who may not want to reveal themselves and their living spaces via Zoom (Cirucci, 2023).

Although the survey pool was small, it does indicate that overall, students found the panel useful ("Did you find the content of the alum presentations useful for you as an English Major?" Extremely useful: $n = 3$; very useful: $n = 1$; moderately useful: $n = 1$. "Did you find the Q&A at the end useful for you as an English Major?" Definitely: $n = 3$; probably: $n = 2$) and felt it helped connect them, at least somewhat, to campus and faculty ("After watching the English Majors Career Panel (either live or the recording), do you feel a stronger connection to faculty or your campus?" Yes: $n = 4$; maybe: $n = 1$).

Hearing about alumni presenters' experiences also resonated for some ("Did you feel like any of the alum presenters had experienced challenges or situations as a student similar to what you have experienced?" Very much so: $n = 2$; perhaps: $n = 3$). One student wrote:

There was one alum speaker who said he worked retail (as a manager) and his schedule allowed him little time to see his family due to working nights. He used his experience in retail and business to help him land a career in technical writing using these skills. His past job is similar

to my job right now, since I am a retail manager who works mostly nights. Hearing that I could use my experience in retail like he did in technical writing was very interesting.

Another commented: “I enjoyed the chance to hear from people using my degree in the real world after college.” One student indicated they “live out of state,” which may indicate they were a respondent who answered that it did not make them feel as if they belonged on campus (“Did watching the English Majors Career Panel affect whether you feel like you belong on this campus?” Yes: $n = 2$; maybe: $n = 1$; no: $n = 2$).

The event was recorded and uploaded to the Senior Seminar Canvas site, so that students unable to attend in person could watch the event later. This kind of flexibility in access is part of adjusting teaching (and other) interactions with distance and working students' needs in mind (Thomas et al., 2014, p.78), which echoes the senior exit survey comment mentioned above. The two students who granted us permission to use their reflections about the panel in our research both attended the live version of the Career Panel, which might indicate a stronger desire to connect with the speakers and campus community. Other students could not attend owing to their schedules or perhaps a lack of desire to engage with the speakers; those students watched the recording.

The idea of matched pairs was also part of what we wanted to accomplish with this event, as we hoped to foster identification among current students and alums, such as that of the student quoted above who identified with the night-work manager. Beyond the survey data, this identification also appeared in the reflection excerpts from two students, both of whom were fully online, nontraditional, and worked full-time. Student A responded:

The English Majors Career Panel was very informative and insightful as to what I can do with my degree in the future. The panelists were from all types of careers and different backgrounds, giving us students a variety of perspectives and demonstrating that my degree can fit wherever I need it within the English realm.... Listening in on the part of this career panel felt in some ways like *I am not alone* [emphasis added], rethinking my future career path along with *giving me the ability to see that there are a plethora of paths that I can take with the degree I am earning* [emphasis added].

Student B commented: “One common theme that stood out to me from the alumni panelists is they all seemed happy with their current work positions. *Seeing their satisfaction helped me to feel that I will find a job that I enjoy* [emphasis added].”

These comments indicate that the panel may broaden students' thinking about the possibilities for them when they graduate with a technical writing degree. As all students create a LinkedIn profile, which provides faculty with a way to keep in touch with our alumni (and find panelists), it would also be an ideal way to pair former students with current students in a mentoring relationship. Ideally this would occur long before the Senior Seminar class, perhaps during the gateway course. Students could be matched based on career interests or other demographics. Being in contact with former students also opens possible avenues for internships. An interesting example of this resulted from the Career Panel. The panelist who was a grant writer/business owner approached one of us (M.T.E.) after the panel to ask for help in finding a remote intern, specifically someone to focus on marketing/social media, to help grow her already successful business. This may potentially lead to further work, perhaps full-time employment, and subsequent internships. Similar future opportunities/partnerships would provide excellent experiences for our students.

Event 3: Celebration of Student Writing

The Event and Associated Publications

Celebration of Student Writing is “a term which generally refers to events hosted at colleges or universities with the express purpose of displaying first-year writing (FYW) students’ classroom work for live audiences via art installations, posters, and presentations” (Carter & Gallegos, 2017, p. 74). The IU East Writing Program had been hosting Celebration events since 2018 but during the first 2 years, the focus was almost exclusively on in-person students. Teachers signed up their classes, and they all arrived on the appointed day, with posters and talks and PowerPoints, to present their work in an event similar to a science fair. Then, in 2020, in the throes of the pandemic, Celebration moved online. Rather than students synchronously presenting their work, five students (a mix of online and on-campus students) made short videos about their writing, which were presented during a Facebook live-streaming event, along with a keynote address on composing during times of disruption. The event was later archived on our campus YouTube channel. Reimagining the event had a fortuitous byproduct: Online students could participate and attend.

To strengthen the participation of students in the online event, and again echoing the idea of matched pairs, starting in 2021, we asked faculty across the curriculum to individually nominate students for the event via a Qualtrics survey. Nominated students, whether from an in-person or an online class, were then notified of the professor’s nomination and invited to participate in the event, which involved the publication of their work in an IU Pressbook, accompanied by an individualized introduction that included quotes from their faculty nomination.

Pressbooks is an online e-book platform that is an ideal tool for publishing student work of all kinds. The layout is clean, the entries are easy to navigate, and the format creates space for multiple voices: nominators (faculty), writers (students), keynote speakers, and event organizers. This technology—a digital space for multiple voices—fostered a sense of belonging in student writers in a visually powerful way, because it let us bring together, on the same digital book page, a faculty voice (the nomination) with a corresponding student voice (the nominated work), as a matched pair. The pages were designed so that the text of the faculty nomination was at the top, followed by the title of the work, the student's name, and the work itself. The faculty nomination was specific to the student and their original work; the nomination form asked the faculty to elaborate on why they were nominating the work and let them know that their words would be included as part of the student's page.

Our goal in using this technology, among other reasons, was for the student to be able to read their professor's rationale in a public space, and for them to (hopefully) see that they are “an important part of the life and activity” of the campus, a key ingredient to feeling like one belongs (Goodenow, 1993a, p. 25, as cited in Strayhorn, 2019, p. 11). As Blewett wrote in the introduction to the first IU Celebration Pressbook in 2021: “These pages make visible the appreciation and affirmation that is often communicated in private educational spaces, such as the margins of papers or an electronic gradebook” (Blewett et al., 2021).

The platform supports images, text, video, and audio within the Pressbook, which in turn allows publication of diverse genres of student work, such as essays, magazine articles, website pages, videos, and infographics. The publication of the Pressbook creates an important context for the synchronous, live-streamed keynote, and it is publicly accessible to everyone, not just the IU community. It is easy to create a Pressbook, with just a modest learning curve. Finally, the product of the Pressbook, as a URL, is durable, stable, and easily shareable.

About 50% of nominated students opted to participate. Ultimately 25 students participated in the Pressbook project that year, and each received a signed copy of the 2021 keynote’s latest book.

The keynote itself was live streamed using Facebook Live and subsequently archived in the Pressbook, enabling students to access the address asynchronously if preferred, an important option for inclusive online programming (Liasidou, 2022, p. 12).

Celebration of Student Writing has continued to evolve over the last 2 years. In 2022, the in-person student showcase was reinstated, and the Pressbook project was retained. That year, 45 students were published in the Pressbook, and, again, all participating students received a signed copy of the keynote speaker's most recent book. In 2023, the event again included both the in-person showcase and the IU Pressbook, but this time Pressbook students were invited to present their work synchronously on campus. At the on-campus event, the Pressbook was pulled up on a big screen, and students from three participating on-campus classes gathered in small groups to watch the Pressbook students present their pieces (occasionally with faculty nominators standing nearby and beaming). Again, all participating students (in-person and online) received a signed copy of the book of our 2023 keynote speaker, who also attended the in-person student showcase and whose address was archived in the Pressbook. Of the 49 students whose work was published in the 2023 Pressbook, 12 participated in the in-person showcase. All 2023 Pressbook students were subsequently asked to complete a feedback survey that asked specifically about their feelings of belonging as related to the event.

Survey Results

The survey was completed by 16 students (just over a third of all 2023 Pressbook participants). Several respondents were at the on-campus event. Of the 16 students, eight took classes only online, and eight took classes both online and in-person. Results overwhelmingly demonstrate that the Celebration event effectively impacts several dimensions of belonging for both online and on-campus students.

The first striking thing about the survey results is that all 16 students were “extremely happy” (i.e., 5 on a 5-point Likert scale) to receive the nomination, and nearly the same number of students indicated that they felt the nomination was evidence that they mattered to their professor (definitely yes: $n = 15$; probably: $n = 1$). To better understand these numbers, qualitative comments from the survey were analyzed. The comments, 40 in all, were written in response to the following open-ended survey questions:

- Question 6: Can you say more about why you answered the way you did? [This question appeared after four Likert-scale questions regarding feelings regarding the faculty nomination]
- Question 9: Can you say more about why you answered the way you did? [This question appeared after two Likert-scale questions regarding the publication]
- Question 12: Can you say more about why you answered the way you did? [This question appeared after two Likert-scale questions regarding awareness of peers]
- Question 13: What did you like best about being included in the Pressbook? What suggestions can you make for how we can make the experience better for next time?

To complete the analysis, one author (Blewett) individually numbered the comments and pasted them into an Excel grid, whereupon she read through them looking for patterns and keywords. This process yielded five general themes, four of which we report on in this article (we discarded data regarding improvements that could be made to the event next time). The first theme, which underscores why receiving a nomination felt significant, is about feeling acknowledged and seen as an online student. See representative student comments below (emphasis added):

- It is easy to feel sort of disconnected and invisible when attending school online, especially if one lives so far from the actual campus. It is encouraging to know that even though I do not get the opportunity to meet my fellow students and my professors in person, *I am not just another enrollment number.*
- In the online environment, it's easy to feel as if your assignments are simply checked off of a list—a good student can feel like the good kid in a family, the one that no one worries about and therefore gets less attention than the unruly kid. *This program helps students feel seen and recognized* for the hard work they put into their writing.
- A lot of times as an online student I have little to no interaction with my professors. It often feels that all my effort I put in, though I'm receiving good grades does not matter, *so to be acknowledged is really nice.*
- I often wonder how much impact online students have in the overall course of classes taught during any given semester. The fact that [my professor] not only remembered my work from the previous semester, but thought enough of it to nominate me has *changed my perspective of how an online student can make an impact.*

The nominations represent an opportunity to provide a moment of personalized recognition for students, including online students who are particularly at risk of feeling disconnected (Brodie & Osawska, 2021; Thomas et al., 2014). “Not just another enrollment number” is a slogan worthy of a Celebration t-shirt! A deeper dive into the affective dimensions of this theme underscored the positive emotions that came from feeling acknowledged (emphasis added):

- My professor's nomination message was *uplifting* to me.
- When I heard [my professor] nominated me, *I was touched.*
- I feel that *my instructors are interested in my work.*
- This acknowledgement lets the student know that faculty is not just reading for accuracy and application of instruction. I feel as if they are also looking for ways to *elevate and cultivate* talent.

These comments get at the emotional dimension of the nomination (uplifting, touching), while also describing the excitement of being “cultivated” versus simply assessed. A second theme that came through very strongly via the qualitative comments was validation and accomplishment:

- [The nomination] helped me feel like I chose the right program and am succeeding towards my graduating and future career goals.
- The nomination showed me my work is good.
- I am proud to have my work on display.
- It was great seeing my name in a publication.
- Being published was an honor.

The accomplishment, though, seemed for some students more an individual achievement versus evidence of belonging to a community. In fact, three students went out of their way to make exactly that distinction, which Blewett tracked as the third theme, ambivalence about campus belonging:

- I'm [an] online student who lives out of state, so “belonging on-campus” is difficult. But it did make me feel more confident in my writing.
- I don't go to IUE [IU East]. I attend IUS [IU Southeast] and the class that I wrote this paper for was online through IUE. That being said, I did feel a large sense of accomplishment to have my work recognized by a professor who had only ever known me through Zoom.
- Being nominated for the Pressbook didn't really give me a sense of belonging as much as it gave me a sense of pride in my work.

These students did not feel more of a sense of belonging at IU East as a campus as a result of their participation in this event, but that was not necessarily what they were looking for. These examples underscore the need to attend to the diversity of student experiences and desires (Gravett & Ajjawi, 2022). For our Celebration events, it is up to faculty organizers to “avoid generalized assumptions” (Gravett & Ajjawi, 2022, p. 1392) and to provide multiple options for students, such as the option in 2023 for students to interact with peers at the synchronous event. For students who accepted this option, as well as students who took the time to read their peers' entries in the Pressbook, feelings of belonging to the campus increased, as evidenced by these remarks, which are drawn from the fourth theme: the significance of peers in fostering feelings of belonging:

- Actually, it was standing with the other nominated students at the Celebration, discussing as a group and individually what inspired us to write our papers, how they connected to our majors or interests, and our joint nervousness in presenting our works [that] really helped me to feel connected to them.
- I am always amazed at the quality of work students at IUE [IU East] are producing. Having the opportunity to view their work helps encourages me to do the same. This, to me, is one of the benefits of such a community.
- Reading the other entries and nomination notes from the instructors has increased my sense of belonging.... I value sharing the same alma mater with my fellow writers.

One student took the day off work to be at the event. They wrote: “I'm an older student. But I was on campus for the first time for IU East last night. I realized I miss the campus experience.” This is an important insight for us as event organizers, but it is also important to realize that for some students, coming to an on-campus event is not feasible or desirable. They may feel affiliations to other communities, such as the student who identified as attending IU Southeast, or the students who report living out of state. What we need to do now, perhaps more than at other stages of our institution's existence, is to think about the multiple dimensions of belonging and to design occasions that will connect to them, in different ways for different students, so that students have options for participation that reflect their interests and can take from the events what they need.

Reflections and Cautions

It would be naïve to assume that single events, such as described here, are a silver bullet. Rather, they should be viewed as just a few examples of numerous interventions, as part of a sustained program of fostering belonging and sense of mattering (Flett et al., 2019). Another caution is that these events take time. Just as online courses require careful planning and preparation, so too do these events. Online students are often pressed for time, and notions that “online learning can happen anywhere, anytime” have been found to place additional “stress and burden on students” (Gravett & Ajjawi,

2022, p. 1391). Setting up events such as these in inclusive and purposeful ways will require increased planning and time from organizers—thinking through synchronous versus asynchronous options, marketing the event ahead of time, keeping the burden on students appropriately light so that participation in the event feels doable, not penalizing students for their inability to participate as fully as the organizers (or they) might like. Event organizers should offer “multiple and varied opportunities to interact” to allow “a diverse range of students to select opportunities to engage that best fit within their own unique learning needs” (Thomas et al., 2014, p.79). With these cautions in mind, we do think the events we have described here offer insights for faculty interested in using technology to enhance feelings of belonging and mattering for distance students.

Most importantly, they collectively suggest that the idea of matched pairs provides a framework for student connections to be forged or enhanced in online spaces in highly personalized ways. In terms of events that pair students and teachers, such as the Faculty+Student Reading and the Celebration of Student Writing, these online spaces may present an opportunity for the domains of academic belonging and social belonging to converge (Ahn & Davis, 2020, broadening the potential takeaways for students (e.g., feelings of camaraderie and/or feelings of individual accomplishment). In reflecting on the events featured here, we noticed that the Faculty+Student Reading offered a closer and more equalizing tie between the three participating faculty/student pairs, whereas the Celebration of Student Writing took advantage of a polyvocal online publication to feature many matched pairs simultaneously, while keeping the faculty/student hierarchy more or less intact. They thus offer useful models for how technology can be used to enhance faculty–student connections. The English Alum Career Panel also successfully fostered identification for a different type of matched pair—current and former students—and was open-ended enough to create space for students to see themselves in the presenters in multiple ways.

Moving beyond these events, there may be other pairings that would be helpful for students, such as community leader/student, internship opportunity/student, and student/student. For example, in an online writing course this spring, one of us (Blewett) realized that two students were mothers of children of a similar age and working in similar fields. She pointed out this commonality on a discussion forum, sharing details about her own children and noting that over half the class were working parents. In light of the idea of matched pairs, this everyday encounter on an online discussion board, which Blewett had previously framed as a self-introduction activity along the lines described by Thomas et al. (2014, p. 76), gleams with new potential. What would it look like to create a space for students who are working parents to connect with each other, foregrounding the similarities in the intersections of their identities? Such an opportunity would certainly be logistically tricky to facilitate, but the potential payoffs in terms of belonging are high.

University educators are accustomed to thinking about belonging as representing the fit between a student and an on-campus culture, often connected to “the privileged identities of the ‘typical’ or ‘authentic’ student: young, full-time and residential” (Thomas, 2015, as cited in Gravett & Ajjawi, 2022, p. 1388), yet in reality, campuses are bigger and more diffuse than the physical spaces in which they reside, and students are more complex and diverse than the privileged identities previously assumed. In the midst of these changes, the case study presented here suggests something hopeful: that technology can be purposefully used to foster belonging in small spaces, celebrating individual connections and prompting greater attention not only to student retention but also to the “constellation of relations, intimately entangled with identities, becoming and learning” (Gravett & Ajjawi, 2022, p. 1393) that students want and need.

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Online Collaboration Tools and International Students' Sense of Belonging in Group Work

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Abstract: Group work has been widely used as a pedagogical practice in higher education institutions in the United States. Nevertheless, few studies have looked into the processes of collaboration for group work involving international students who speak English as a second language. This population of students, which is increasing at my university, is usually at a disadvantage linguistically and culturally compared to their American peers in group work, which might pose challenges in their communication and interactions with group mates and lead to a lack of a sense of belonging in the group and also in the class. Part of a larger research project on international students' learning experience with group work, this study focuses on three international students' experiences using online collaboration tools for group work. Pedagogical implications for using online collaboration tools in group work to enhance international students' learning and sense of belonging are discussed.

Keywords: international students, group work, online collaboration tools, sense of belonging

Group work has been widely used as a pedagogical practice in higher education institutions in the United States. Especially in business schools, group work has become an important component of curricula and instruction to “help students learn through interaction with others as well as to become accustomed to working in a group environment that emulates the work place” (Yang, 2014, p. 74). Research has also shown that employers value the ability to contribute and manage group projects in new graduates (Storch, 2017). Yet using group work as a pedagogical tool also has potential problems. For instance, a lack of sense of belonging among students can pose significant challenges in group work. When students do not feel a strong connection or identification with their group, it can hinder effective collaboration and the overall success of the project (Trujillo & Tanner, 2014). For institutions with increasing numbers of international students who speak English as a second language (L2 students), the possibility that group work may cause friction among different linguistic and cultural groups is an additional cause for concern. As Ledwith and Lee (1998) emphasized, “the issues of mixing different cultures and of English language ability” is prominent in the tensions caused by group work (p. 103).

One of the greatest challenges that international students face when studying in higher education institutions is the lack of linguistic and cultural knowledge for meaningful interaction with faculty and peer students (Zou, 1998). Many of them are uncomfortable about participating in class discussion and are afraid of exposing their lack of familiarity with both social conventions and the necessary linguistics skills. Nonetheless, a survey of over 2,000 students from eight Asian countries revealed that international students:

Do not, in fact, wish to be spoon-fed with facts from an all-knowing “fount of knowledge.” They want to explore knowledge themselves and find their own answers. Most of all, they want to do this together with their fellow students in an atmosphere which is friendly and supportive. (Littlewood, 2000, p. 34)

Various online collaboration tools (e.g., Google Docs, Microsoft Teams, Canvas Group, etc.) have been proved to increase collaborators' productivity and efficiency (e.g., Chu et al., 2009; J. Li & Mak, 2022; Orellana, 2017). The asynchronous and text-based features of such tools can also make

communication easier and more comfortable for international students who are not confident in their language skills. Still, insufficient attention has been given to how technology use supports international students in navigating linguistic and cultural differences, facilitates effective communication with their group mates, and ultimately enables them to gain a strong sense of belonging in group work and learn from the collaboration experience. This study fills this research gap by examining the ways that international students use online collaboration tools to interact with group mates and develop a sense of connectedness as well as community, which positively impacts their overall learning experience in the class.

Literature Review

Group work, on the face of it, will facilitate greater interaction and collaboration between students regardless of linguistic and cultural differences, but this is not always the case. International students are likely to be excluded from groups if their language abilities are judged insufficient (Ledwith & Lee, 1998). Most of the time, it is not easy for them to be accepted by other students who speak English as their first language (L1 students) regardless of whether the groups are formed by instructors or self-selected (Verbitsky, 1998). Even if the international students are capable and motivated, a lack of mastery of academic English may interfere with their ability to contribute to the group, which forces them to become unwilling free riders and “puts in question the legitimacy of the use of group work” to assess students’ learning (Morris & Hayes, 1996, p. 231).

For group work involving international students, there are more issues that deserve instructors’ attention. For instance, language proficiency might hold these students back from participating in group discussions, and their contributions are sometimes not valued by the L1 group members, both of which will be detrimental to international students’ self-esteem. This increasing population of students is usually at a disadvantage linguistically and culturally compared to their American peers in group work, which might affect their communication and interaction with group mates and lead to a lack of a sense of belonging in the group as well as in the class. Leki (2007) and Yang (2014) found that group work requiring L2 students to collaborate with L1 students might pose challenges to the L2 students because they often defer to their L1 group members and contribute much less to group tasks. Patterns of authoritative/responsive and dominant/passive peer interaction may also discourage international students from voicing their thinking (Storch, 2002; M. Li & Zhu, 2013).

In particular, international students might have negative experiences of working in multilingual and multicultural groups if the L1 group members focus on completing the task with efficiency, positioning them as incompetents and ignoring their suggestions on the group project (Leki, 2001). Oftentimes, face-to-face communication can pose more challenges to international students for various reasons. They might be unconfident about their oral English competency or feel reluctant to speak up because of cultural differences. More importantly, international students usually need more time to process language—both the input (what they hear) and the output (what they want to say)—in discussions because they are switching between two languages (their L1 and L2) during the thinking process. Nevertheless, most L1 English-speaking students are not aware of the special needs (e.g., patience) that their international group mates might have and unconsciously exclude them from discussions.

That being said, asynchronous and text-based features of online collaboration tools (e.g., Google Docs, Microsoft Teams, Canvas Collaborations, etc.) can help international student process the language input and output more easily and alleviate the embarrassment they may feel when unable to produce immediate responses to group mates because of linguistic barriers. For low- or intermediate-proficiency international students, group tasks can also be good opportunities for language learning, but only if there is support in the process of putting their ideas in the target language

(Swain, 2010). Research has indicated that online collaboration tools provide a range of benefits. First, they enable asynchronous collaboration, allowing students to work together effectively without the need for simultaneous communication. This inclusivity is crucial for international students who may need more time to respond (Poupore, 2016). Second, online platforms offer a shared workspace, permitting students to collectively edit and contribute to documents in real time. This not only encourages active participation but also cultivates a sense of shared responsibility, fostering a collaborative learning environment (M. Li, 2018). Additionally, these tools maintain a transparent record of contributions, which proves valuable for assessing individual participation in group projects (McKenna et al., 2022). Overall, leveraging these online collaboration tools aligns with best practices in promoting inclusivity and effective group work, especially for diverse student groups (Meeuwisse et al., 2010).

This study examined the ways that international students interact with group mates using online collaboration tools, aiming to address the following research questions: (1) To what extent does the implementation of online collaboration tools enhance international students' participation, interaction, and collaboration in group work? (2) How does this influence their overall sense of belonging in the learning community?

Method

To draw a clear picture of how international students use online collaboration tools in group work and how it impacts their sense of belonging, I relied on a qualitative design and conducted a study in a real setting of learning. Part of a larger research project on international students' learning experience with group work, this study focused on three international students' experiences using online collaboration tools for group work. Creswell (2007) claimed that qualitative research can be a powerful tool to study "research problems inquiring into the meaning individuals or groups ascribe to social or human problems" (p. 37); it thus is a suitable methodology for this study with the objective to better understand the educational practices and experiences of international students in group work.

Several features characterize qualitative research, including an emergent design, researchers' role as a key instrument, multiple sources of data, and a focus on participants' meanings, which all contribute to a holistic account of a complex problem (Merriam, 2009). Specifically, I conducted case studies of individual international students' learning from group work in a business writing course. Since the research questions are contextually specific and address contemporary issues, they comply with the conditions of choosing a case study method (Yin, 2009). In addition, case study research can also be used to understand a larger population of similar units (Gerring, 2007), which enables this study to generate insights for more classes involving international students.

This research was conducted in a business writing course at a research university of approximately 40,000 students in the Midwest region of the United States, 12% of whom are international students. The university has a long tradition of enrolling international students, with many classes including members of this linguistically and culturally diverse student population. The course includes a case project in which students form groups to discuss the business problems they identify in the case and collaboratively write a proposal and final recommendation report to address those problems. Typically, the group proposal is the first collaborative writing task in this course, so more instructions are provided throughout the process to ensure the success of students' collaboration.

For this study, I designed a series of scaffolding activities and tasks guiding students to use online tools for collaboration and to prepare them to transition from individual work to group work (see Figure 1). The process started with students writing a case analysis individually. They then participated in group work including collaborative peer review and group discussions (both synchronously in class and asynchronously online) to create a group proposal before working on the

recommendation report. Primarily, the collaboration tools the instructor chose for the class were the collaborative document platform and discussion board embedded in Canvas (a learning management system used by the university), as they are accessible to all the students. More specifically, the scaffolding activities and tasks included (1) assigning an individual case analysis in which each student documented their individual research based on the case prompt and wrote down their initial thoughts on the business problems they identified in the case; (2) using the collaborative document platform embedded in Canvas for group peer review of the individual case analysis and then having students meet in person to debrief the peer review; (3) creating group discussion boards on Canvas for each student to post their reflections on the individual case analysis as well as their ideas/thoughts for the group proposal before the groups met in person to plan for the proposal; and (4) asking each group to submit an outline for their group proposal based on their online and in-person discussions. (5) Then every student was assigned by their group to write 1 or 2 paragraphs for the group proposal and review each other's paragraph(s), again using the collaborative document platform embedded in Canvas. (6) After completing the collaborative peer review of group proposal, each group was required to submit a plan for revision before they submitted the final product of their group proposal for a grade.

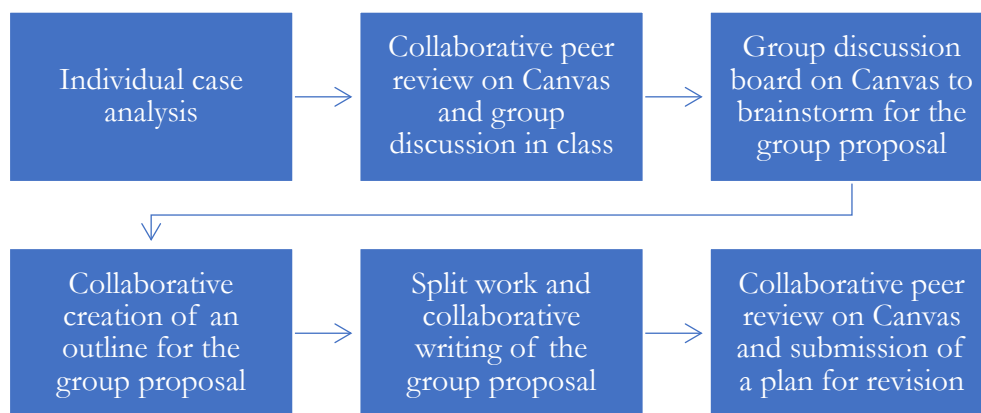


Figure 1. A series of scaffolding activities and tasks guiding students to use online tools for collaboration.

Students' posts on the group discussion board and all their written work on the collaborative documents (including their comments on peers' writing) were collected and analyzed. Upon completion of the case project, every student was asked to write a reflective essay on their group work experience and what they learned from the experience. One of the questions they needed to address in the essay was about the use of online collaboration tools and how it affected their group work. When the semester ended and final grades were posted, all the international students in the course were invited to a focus group interview to discuss their experience with the online collaboration tools used in the class and the factors that impacted their sense of belonging and learning in group work. The interview questions used in the focus group can be found in Appendix 1. Among all those who voluntarily participated in the interview, three international students—John, Cathy, and Sam (pseudonyms picked by themselves and used for privacy purposes)—were selected as the focal participants of this research and subjects of the case study. They are from different countries and

learned English as a second language in their home country. Although the participants were all business majors, their previous educational background before college and English proficiency varied. Table 1 provides a profile of each participant.

Table 1. Profiles of the three participants.

Participant	Nationality and transnational experience	First language	Major and minor studies at college	Educational background before college
John	South Korean; arrived in the U.S. at the age of 18 for college	Korean	Major in accounting and minor in technology management	Graduated from a private high school in South Korea
Cathy	Chinese; arrived in the U.S. at the age of 19 for college	Chinese	Major in finance and minor in business analytics	Graduated from a public high school in China and had studied in a Chinese University for 1 year before transferring to the university in the U.S.
Sam	Vietnamese; arrived in the U.S. at the age of 18 for college	Vietnamese	Major in finance and minor in entrepreneurship	Graduated from an international high school in Vietnam

Note. John, Cathy, and Sam are pseudonyms.

The primary analytical approach involved constant comparison of distinct data sources and types across cases. This analytical process can be divided into three distinct stages. First, the process commenced with open coding, wherein concepts from the text—interview transcripts and written reflections—were categorized and labeled as codes or subcodes. This inductive and iterative process involved extracting, interpreting, and defining codes and subcodes from the participants' own expressions. Subsequently, I systematically contrasted and compared these codes, leading to the identification of thematic patterns. The coding process culminated in selective coding—where codes were refined into a provisional framework for findings. Appendix 2 provides a sample of categorized themes and codes across cases.

Findings and Discussion

Sense of belonging is a fundamental aspect of learning, particularly for international students who might encounter linguistic or cultural barriers in group work or in class (Meeuwisse et al., 2010). When students feel connected to their learning community and valued as participants, it can significantly enhance their motivation, engagement, and overall learning outcomes. This study found that online collaboration tools can foster a sense of belonging through group discussion boards and collaborative peer review. The benefits of using a group discussion board on Canvas and doing peer review on collaborative document platforms are the two most salient themes that emerged from students' reflective essays regarding their group work experience and use of online collaboration tools. Data obtained from the focus group interviews with the international students substantiated the positive effects that the utilization of these tools can have on students' learning. Additionally, the data revealed how the online discussion board and peer review facilitated through collaborative documents can

augment international students' sense of belonging by fostering inclusivity and a shared learning experience. The asynchronous functionality of these online collaboration tools gave international students ample time to prepare their contributions, thereby enhancing their confidence in actively engaging in group work.

Group Discussion Board—Build a Learning Community

Online discussion boards provide a virtual space for students to collaborate with their peers in group work activities. This tool enables students to engage in discussions, share ideas, and work collectively toward common goals. Collaborative activities on discussion boards can also foster a sense of belonging as students realize they are part of a collaborative community, working together to achieve academic success (Zengilowski et al., 2023).

Particularly, online discussion boards offer international students an inclusive environment that ensures equal participation in group work. Unlike face-to-face discussions where certain students may dominate the conversation, online discussion boards provide an opportunity for all students to contribute their ideas and perspectives. This inclusivity is especially important for international students as they feel valued, respected, and recognized for their contributions. When every student has a voice and the opportunity to actively engage with their peers, a sense of community and belonging is fostered. As John said in the interview:

I know I have an accent, so I am reluctant speaking up in the group discussion. The discussion board on Canvas was helpful when we were planning for the group proposal. I feel more comfortable writing down my ideas first and sharing with my teammates without being embarrassed about my accent. The online discussion board also helped me better prepare for the later face-to-face discussions, because I was given time to read through my teammates posts and think about my response.... If we jump to face-to-face discussion immediately, I might not fully understand their ideas when they speak fast and thus not be able to respond to or discuss with them.

John's sentiment also indicated that online discussion boards facilitate rich and meaningful interactions among all students in group work (Woo & Reeves, 2007). Through written communication, international students have more time to reflect on their thoughts and articulate their ideas more effectively. This medium allows them to provide more thoughtful responses, ask questions, and engage in in-depth discussions. John also said:

After reading my posts, my teammates also seemed interested in my ideas and they asked me questions in the face-to-face discussion, which made me feel good about myself because I was contributing, and their questions prompted me to refine my ideas.... In my other classes, my ideas do not seem to matter because I don't talk a lot and no one really asks what I think.

By actively engaging in ongoing discussions and reflecting on their own growth, international students develop a stronger sense of belonging as they witness their progress and contributions within the group dynamic. Furthermore, online discussion boards provide international students with a platform for continuous learning and reflection within the context of group work (McKenna et al., 2022). Students can review and reflect on previous discussions, revisit their own contributions, and learn from the ideas shared by their peers. This reflective process encourages metacognitive awareness and enhances the learning experience, which can be seen from Sam's case:

We used the discussion boards outside of classroom as well. After posting our initial thoughts and individual ideas on the case, my group mates also shared resources on the discussion board and we had some informal discussions afterwards (to review or update our ideas and plan for the case project). This helped us develop bonds and trust as I felt a genuine investment in each other success.

Sam was a quiet student in the class. Similar to John, he did not seem confident in his oral English and often sat by himself to avoid interacting with classmates. However, the online discussion board contributed to the development of a robust learning community and created opportunities for him to offer and receive support during group work activities. Moreover, the asynchronous nature of online discussions provides flexibility, allowing students to participate at their own pace (Zha et al., 2006). These interactions promote intellectual exchange, critical thinking, and collaboration, contributing to a sense of belonging as international students engage in meaningful academic discourse with their peers.

Collaborative Peer Review—Shared Responsibility and Learning Experience

Peer review is another effective method for fostering a sense of belonging in group work, especially if it is facilitated by online collaboration tools. For international students, collaborative peer review on digital platforms creates opportunities for them to engage in meaningful conversations with their peers regarding their jointly owned written work. The online collaboration tool embedded in Canvas or other collaborative document platforms such as Google Docs or Microsoft Teams allows students to work together synchronously or asynchronously, contributing to a shared product. This collaborative process also encourages cooperation and a sense of shared responsibility (Marshall et al., 2012). As Sam shared in the interview:

I like the way we did peer review in this class because all group members' work was on the collaborative document. I could see how my peers wrote and how they commented on my as well as others' work. Because it was a collaborative document and we all knew that whatever we did on the document was for the whole group, everyone took it seriously as no one wants to look like a slacker. I can say that most of the comments I received were helpful and I learned a lot from my peers.

Participating in peer review through collaborative documents creates a shared learning experience for international students. As they engage in reviewing and being reviewed, they develop a sense of camaraderie and mutual learning. The shared experience of working toward a common goal and collectively improving their work also makes them feel more connected with peers. International students may realize that they are not alone in their learning journey but are part of a supportive community where everyone is committed to each other's success.

In addition, this approach harnesses the power of collaboration and technology to enhance the overall learning experience of international students and strengthen their commitment to English language learning. The collaborative document platform allows for specific, targeted comments and suggestions that can be directly incorporated into the document. This not only benefits the recipient of the feedback but also helps the students providing the feedback deepen their understanding of the subject matter and enhance their own language skills as they analyze, evaluate, and offer suggestions for improvement. This kind of interaction promotes both language development and intercultural understanding, as international students gain exposure to different writing styles, perspectives, and cultural nuances, enhancing their linguistic competence and at the same time expanding their rhetorical

toolkit (Marshall et al., 2012). Through the collaborative nature of peer review, all students establish connections, build relationships, and develop a sense of belonging within a culturally and linguistically diverse learning community.

As a case in point, Cathy is a transfer student from a university in China. She was a top student back in China and is proficient in both oral and written English. However, she still faced challenges when studying in the United States:

The way that people speak and write English here is different from what I learned in China. I often struggle with picking the most accurate word for my communication and sometimes my American peers cannot understand me because my thoughts are in Chinese and my expression might be an awkward translation of them.... In the collaborative peer review, I told my teammates that I would like them to point out the language issues (e.g., grammar errors, incorrect word choice, and unclear expressions) in my writing and I appreciated it that they were willing to do that. If I don't understand their comments, I would also ask for clarification. By fixing the language problems with their help, I improved my writing.... Reading all my teammates' writing on the collaborative document also enabled me to see different writing styles, and I felt happy when my teammates made changes to their writing according to my comments because it means that they care about my comments and I am able to help them as well.

Cathy's case suggests that peer review through collaborative documents empowers international students by providing them with an active role in their learning process. They become active contributors to their own learning and the growth of their peers. Collaborative document platforms also allow students to take ownership of their work, make revisions, and incorporate feedback, which enhances their sense of agency and autonomy. By actively participating in the peer review process, international students feel a greater sense of belonging, knowing that their contributions are valued and that they play a crucial role in the success of their group.

Nevertheless, it is worth noting that even though peer review through collaborative documents offers numerous benefits, it is essential to address potential challenges for international students and ensure inclusivity. Teachers should provide clear guidelines and expectations for the review process, establish a supportive and respectful environment, and promote peer-to-peer interactions in class (Aly et al., 2022). Otherwise, students, especially international students, may face negative experiences during peer review, which can include receiving feedback that is unconstructive or lacks usefulness, as well as feeling that their comments are undervalued by others. Additionally, teachers need to offer scaffolding and support for students to navigate the review process effectively and provide opportunities for reflection and discussion to address any concerns or difficulties that arise (Gueldenzoph & May, 2002). For example, John stated in the interview that it was beneficial to have a face-to-face group discussion after completing peer review on the collaborative document so that everyone got an opportunity to ask questions for clarifications or improvement. The course requirement of submitting a group plan for revision based on the peer review was also considered an important step to better prepare the group for their next collaborative writing task.

Summary

In today's digital age, technology has transformed the way people communicate, collaborate, and learn. Although group work plays a crucial role in learning, allowing students to interact, exchange ideas, and engage in collaborative tasks, it might pose challenges for international students because of linguistic barriers and cultural differences. However, the integration of online collaboration tools such as

discussion boards and collaborative document platforms has shown immense potential for enhancing students'—especially international students'—sense of belonging in group work and their overall learning experience.

Online discussion boards provide a virtual space where students can actively participate in group discussions, express their opinions, and establish connections with peers. This tool enables international students to overcome communication obstacles that may arise in face-to-face interactions. The asynchronous nature of online discussion boards offers opportunities for thoughtful reflection, as students can compose their responses and contributions at their own pace, allowing for more considered and comprehensive responses. Such inclusivity enhances collaboration and ensures that all students have equal opportunities to engage and contribute. This sense of participation and involvement also contributes to international students' sense of belonging and creates a supportive learning community.

Collaborative document platforms have also proven to be advantageous in facilitating students' ability to provide and receive constructive feedback in group work, bolstering the quality and impact of their collaborative projects. They also help foster a sense of community and shared responsibility for learning outcomes. Through collaborative peer review, students can collectively refine their ideas, exchange perspectives, and develop critical thinking skills. For international students in particular, this interactive learning experience offers significant benefits in terms of language and rhetorical development. Through the process of reviewing and providing feedback on their peers' work, international students are exposed to different writing styles, language structures, and rhetorical strategies. This exposure allows them to observe and internalize various language and rhetorical conventions used by proficient writers. Actively analyzing and discussing language choices, organization, and argumentation also contributes to those students' understanding and application of language and rhetorical principles. Overall, peer review on collaborative document platforms acts as a valuable tool for international students to improve language skills in an interactive and supportive environment. It also promotes the development of a sense of belonging, which is vital for academic success.

Above all, the findings of this study reveal that engaging in online discussions and collaborative peer review empowers international students to take ownership of their learning process. Thus, this study joins the call for educators to harness the potential of these technologies to create inclusive and effective learning environments where students feel connected and supported. The online collaboration tools such as discussion boards and collaborative document platforms remove obstacles for international students and encourage active participation in group work. They also allow them more time to prepare for effective communication with peers and help them develop a greater sense of responsibility for their contributions and their role within the group. Consequently, international students become more engaged, motivated, and invested in their learning journey.

Pedagogical Implications and Recommendations

This research offers valuable pedagogical insights for instructors aiming to enhance the learning experiences and sense of belonging of international students engaged in group work, particularly those for whom English is a second language. The challenges these students face in communication and interaction within groups can be mitigated by integrating online collaboration tools effectively.

First, instructors should purposefully structure groups, considering the linguistic diversity and cultural backgrounds of the students. Balancing teams in terms of language proficiency can promote equitable participation and encourage the sharing of diverse perspectives (Poupore, 2016). Emphasizing the value of diverse perspectives can help international students feel that their experiences and viewpoints are valued.

Second, it is essential to set clear expectations for participation in online discussions and collaborative peer reviews. Explain the purpose, criteria, and expected frequency of engagement. It is also crucial for instructors to provide guidelines on respectful communication and constructive feedback (M. Li, 2018). Integrating regular reflection assignments where students share their learning experiences, challenges, and successes within the online forum can foster a sense of shared journey.

Furthermore, fostering a supportive environment where open discussions about challenges and concerns are encouraged can substantially contribute to the sense of belonging among international students. Regular check-ins, both individual and group-wide, can provide opportunities for students to voice their apprehensions and receive guidance (Zengilowski et al., 2023). Such dialogue can lead to the development of strategies to overcome barriers, thereby promoting a collaborative atmosphere founded on trust and mutual respect.

By strategically utilizing online collaboration tools such as discussion boards and collaborative document platforms, instructors can cultivate a sense of belonging for international students, empower them to engage actively, and enhance their language proficiency and overall learning experience. Incorporating these pedagogical recommendations can not only enhance the learning outcomes of international students within the group work context but also contribute to a more inclusive and enriching educational environment for all students involved.

Limitation of the Research and Future Directions

Although this study has contributed valuable insights into the experiences of international students using online collaboration tools for group work, it is important to acknowledge its limitations. First, the sample was relatively small, consisting of only three international students. This limits the generalizability of the findings to a larger population. Additionally, the study focused solely on the experiences of international students, without comparative analysis with the experiences of L1 English-speaking students. Such a comparative approach could have provided a more comprehensive understanding of the dynamics involved.

Another limitation pertains to the study's duration, which was relatively short and might not have captured long-term effects or fluctuations in students' experiences over time. Moreover, this research predominantly relied on self-reported experiences, potentially introducing bias or recall inaccuracies in the participants' narratives. Objective measures, such as tracking the actual use of online tools or assessing the quality of group outputs, could have provided a more comprehensive perspective.

Building on the insights gained from this study, future research endeavors can address these limitations and offer a more holistic understanding of fostering a sense of belonging for international students with online collaboration tools. As a start, researchers are encouraged to incorporate a larger and more diverse sample of international students, including individuals with different linguistic and cultural backgrounds. In addition, longitudinal studies hold potential for capturing the evolving nature of students' experiences over time. By tracking these experiences over an extended period, researchers can capture potential changes and fluctuations in their sense of belonging within collaborative contexts.

Furthermore, a mixed-methods approach could enrich future investigations by combining qualitative insights from student narratives with quantitative data. This could involve tracking usage patterns of online tools, as well as assessing the quality of group outcomes, to offer a more comprehensive perspective on the impact of online collaboration on both learning outcomes and a sense of belonging. Last, as technology continues to evolve, future research could explore emerging technologies such as virtual reality or mixed-reality platforms. These innovative tools could offer a new context for examining international students' engagement and sense of belonging within collaborative activities. Following these directions in future research can contribute to a

comprehensive understanding of the intricate interplay between online collaboration tools and the creation of a sense of belonging for international students in higher education settings.

Appendix

Appendix 1: Interview Questions for the Focus Group.

For Research Question 1—To what extent does the implementation of online collaboration tools enhance international students' participation, interaction, and collaboration in group work?

1. Can you share your experiences with using online collaboration tools in group work?
2. How have these tools affected your ability to participate actively in group discussions and tasks?
3. In what ways have online collaboration tools influenced your interactions with your group members?
4. Have you noticed any changes in the level of collaboration within your group since the implementation of these tools?
5. Can you provide examples of instances where the use of online tools led to increased engagement and better collaboration?
6. Are there any challenges you've encountered while using these tools for group work?
7. How do you perceive the impact of these tools on the overall quality of your group's work?

For Research Question 2—How does this influence their overall sense of belonging to the learning community?

1. How connected do you feel to the learning community while using online collaboration tools in group work?
2. Have you noticed any changes in your sense of belonging to your academic community since the implementation of these tools?
3. Can you share examples of moments when the use of online tools positively or negatively influenced your sense of belonging?
4. Do you think that online collaboration tools enhance your connection to your peers and instructors? Why or why not?
5. Are there specific features or aspects of these tools that contribute to your feeling of being part of a learning community?
6. Are there any ways you believe the tools could be improved to further enhance your sense of belonging?

Other General Questions

1. How do you compare your experiences with online collaboration tools to traditional face-to-face group-work methods?
2. What recommendations do you have for optimizing the use of online collaboration tools for group work?
3. How important do you think it is for international students to feel connected to their peers and learning community? How does technology play a role in this?
4. Is there anything else you'd like to share about your experiences with online collaboration tools and their impact on your group work and sense of belonging?

Appendix 2: A Sample of Categorized Themes and Codes.

Theme	Code (subcode)	Example
Challenges for international students in group work	Language barriers	“I sometimes struggle with expressing my ideas effectively due to language limitations. Communicating complex business concepts and ideas in a group setting can be especially challenging.” (Sam, interview, 2022)
	Cultural differences	“Group work often involves collaboration with peers from diverse cultural backgrounds. I find it somewhat difficult to navigate cultural nuances in communication styles, teamwork expectations, and decision-making processes.” (Cathy, interview, 2022)
	Unequal participation	“I feel hesitant to contribute actively in discussions due to a fear of making mistakes or a lack of confidence in my language skills.” (John, interview, 2022)
	Time constraints	“I need more time to process information and think about my responses. This may lead to time-related challenges during group discussions and collaborative activities.” (Cathy, interview, 2022)
	Meeting expectations	“Business writing classes require a high level of professionalism in communication. I sometimes find it difficult to meet these expectations, leading to frustration.” (John, interview, 2022)
	Group dynamics	“Building rapport and establishing effective group dynamics can be difficult when I am communicating with native speakers or others with higher language proficiency. I don’t know when I should speak up, and sometimes there are feelings of isolation or marginalization.” (Sam, interview, 2022)
Benefits of using online discussion boards	Written communication	“Group discussion boards mainly involve written communication, which allows me to carefully construct and edit my contributions. This can alleviate the pressure of spontaneous oral communication and enable me to express my thoughts more clearly.” (John, interview, 2022)
	Time flexibility	“Online discussion boards provide flexibility for me to participate at my own pace. I can take the time I need to compose thoughtful responses without the pressure of face-to-face interactions.” (Sam, interview, 2022)
	Reduced anxiety	“I often experience anxiety when speaking up in group discussions. Using a discussion board reduces the anxiety associated with speaking and allows me to focus on conveying my ideas effectively.” (Cathy, interview, 2022)
	Equal participation	“In face-to-face discussions, I might hesitate to participate due to language barriers. In a discussion board, contributions are given equal weight, allowing me to engage more actively without the fear of being overshadowed.” (Sam, interview, 2022)

Theme	Code (subcode)	Example
	Collaborative learning	“Written discussions on a board create a record that I can refer back to. I can learn from my peers’ responses, share insights, and benefit from different perspectives.” (John, reflective essay, 2022)
Benefits of doing peer review on collaborative document platforms	Clearer and more structured feedback	“Collaborative platforms make the peer review process more organized and systematic. I can provide and receive feedback directly on the document, making it easier to understand and address specific areas for improvement.” (Sam, reflective essay, 2022)
	Reduced language anxiety	“I feel more comfortable offering feedback in writing rather than speaking. Collaborative document platforms reduce my language anxiety and allow me to express myself clearly and thoughtfully.” (John, interview, 2022)
	Language modeling and peer learning	“Working on the collaborative document, I can learn from my peers’ writing styles and language usage, and improve my own language skills.” (Cathy, reflective essay, 2022)
	Revision tracking	“Collaborative platforms track changes and revisions, allowing me to see how my work evolves over time and learn from the editing process.” (John, reflective essay, 2022)
	Higher engagement	“Collaborative platforms have interactive features, making the peer review process more engaging and enjoyable for me.” (Sam, interview, 2022)
Sense of belonging	Community building (feel valued)	“The questions they (the peers) asked make me think deeper, refine my ideas. I feel that I become an active participant in the discussion. In other classes, I might hide myself in the corner, but on the discussion board I sometimes can stand out.” (Cathy, interview, 2022)
	Community building (bonding and trust)	“The discussion board wasn’t just a class thing for us. After throwing our thoughts on the case up there, my group and I turned it into a spot for sharing stuff and clarifying doubts. It’s almost like a study group and we can rely on each other.” (John, interview, 2022)
	Shared responsibility	“The peer review setup in this class was something new to me. With our work laid out on a shared document, it felt like we were all in the same boat.... This collective effort made the peer reviews more than just evaluations; we all played a part in shaping the quality of our work.” (Sam, interview, 2022)
	Shared learning experience	“I actually asked my peers to polish my writing because I was not very confident about my language. However, it is not just about fixing errors. I especially appreciate the conversations that we had about why certain things worked or didn’t.” (John, interview, 2022)

Note. Cathy, John, and Sam are pseudonyms.

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Creating a Sense of Global Community and Belonging Through Collaborative Online International Learning

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Abstract: A sense of belonging has been shown to enhance retention and degree completion among undergraduate students. Helping students feel a sense of belonging in a community should be a focus of today's educators. In professions, such as public health, that seek to address global issues that affect people around the world, feeling connected to a global community is becoming increasingly important. A technology-focused educational intervention was developed to enhance a sense of global belonging/ community among two groups of undergraduate public health students from the United States and the United Kingdom using a 7-week collaborative online international learning (COIL) unit. Guided by the intercultural knowledge and competence rubric, one of several rubrics developed by the American Association of Colleges and Universities to assess the achievement of essential skills on college campuses in the United States and abroad, instructors sought to determine if public health students experienced a change in their intercultural competence. A significant change in students' knowledge of cultural worldview frameworks was noted (pretest $M = 2.50$, $SD = 0.68$ vs. posttest $M = 2.93$, $SD = 0.52$, $p < .001$, $d = 0.560$). After the unit was completed, 83% of participants reported an adequate or sophisticated level of understanding people from other cultures, an increase of 39% from prior to the COIL unit. COIL can increase students' knowledge of cultural worldview frameworks, which enhances their intercultural competence and sense of belonging in a global community. Effective learning approaches with technology should be used to enhance student belonging, retention, and degree completion in higher education. Future research should further assess COIL and technology-based learning interventions for positive impacts on belonging.

Keywords: collaborative online international learning, COIL, intercultural competence, belonging, higher education

Helping undergraduate students feel a sense of belonging in a community should be a focus of today's educators. Belonging refers to the extent to which a student feels accepted, valued, and supported in their academic community. When students have a strong sense of belonging, they are more likely to be engaged in their studies, feel motivated to learn, and have a greater sense of satisfaction with their overall experience (Pedler et al., 2021). When students from diverse backgrounds feel they belong, they are more likely to contribute their unique perspectives and experiences to the academic community (Pedler et al., 2021). The quality of relationships with peers, faculty, and staff can help undergraduate students develop social connections and support systems, which are important for overall learning experiences and well-being (Dost & Mazzoli Smith, 2023).

As undergraduate education increasingly transitions onto online platforms, educators are actively seeking ways to engage learners and foster a sense of social identity and belonging in digital learning contexts, as emphasized by Lowenthal and Dennen (2017). The theory of social presence, established through the pioneering work of Short et al. (1976) in the 1970s, remains a subject of continual investigation. Scholars contend that one's identity is intricately linked to the multifaceted versions of self one presents in diverse online settings. A substantial portion of the literature (around 20%) concentrates on defining social presence in terms of connections, belonging, and community—a triad of essential components vital to effective online learning experiences.

Richardson and Swan (2003) conducted an inquiry into the role of social presence in the context of online learning and its influence on student perceptions of learning outcomes. They suggested that although some learners may feel disconnected in the absence of face-to-face interactions and facial expressions, interactions can be effectively fostered in virtual environments through the cultivation of a sense of community and social presence. Hughes (2010) delved into collaborative online learning and the pivotal role of building a sense of belonging or "congruence" within groups based on factors such as gender, age, ethnicity, and socioeconomic status. Hughes highlighted the significance of recognizing the diversity of learners' preparation and opportunities to negotiate identity congruence. Students who lack a sense of belonging are susceptible to disengagement, which emphasizes the importance of pedagogical approaches that facilitate transformative identity shifts to enhance academic success. Hughes further advocated for collaborative online international learning (COIL) as a means of fostering congruence by bringing together diverse groups and novel ideas, underscoring the value of diversity in group learning dynamics.

As a form of virtual exchange and learning methodology, COIL harnesses the power of digital technology and communication (synchronous or asynchronous), making it a positive and practical way to instill a sense of global citizenship among students stepping into an increasingly multicultural world (Evolve, 2022; Strickland et al., 2013). COIL allows students from different countries and cultural backgrounds to work together on academic projects, discussions, and other learning activities. The interactive flow of communication leads to deepened knowledge through dialogue between students from different geographical locations (The SUNY Center for Collaborative Online International Learning, 2020). This form of online learning allows for increased proficiency in intercultural communication and the use of technology to connect with people in different locations, even if there are significant time differences (SUNY COIL Center, n.d.).

In COIL, interaction between institutions is highly beneficial to students' development in intercultural competence through virtual collaboration (Appiah-Kubi & Nichwitz, 2020; Hackett et al., 2023). COIL offers students the opportunity to examine multicultural perspectives and diverse information sources through shared learning spaces and group tasks. These differences in perspectives are highlighted as a way to learn about a topic (de Castro et al., 2019). Students learn to cooperate with peers who have a range of global perspectives on a subject, develop international relationships, and develop effective communication skills with little or no bias (Esche, 2018). Students also expand their awareness of how different cultural perspectives, worldviews, value systems, and contributions benefit interactive learning (Kim, 2015). Therefore, COIL can serve as a mechanism through which students are able to recognize and understand their own way of thinking and effectively interact with students from another country (Foronda et al., 2016).

In professions, such as public health, that seek to address global issues that affect people around the world, understanding other cultures and feeling connected to a global community is becoming increasingly important. According to the American Association of Colleges and Universities (AACU; 2009a, p. 1), "the call to integrate intercultural knowledge and competence into the heart of education is an imperative born of seeing ourselves as members of a world community." In the mid-

2000s, the AACU (2009b) developed 16 valid assessments of learning in undergraduate education (VALUE) rubrics to assess the achievement of essential skills on college campuses in the United States and abroad. Among them, the intercultural knowledge and competence VALUE rubric (IKCVR), purports that intercultural competence is crucial for seeing oneself as part of a global community (AACU, 2009b). Taking into consideration the developmental model of intercultural sensitivity (Bennet, 1993) and the intercultural framework (Deardorff, 2006), higher education experts identified six cognitive, affective, and behavioral skills of intercultural knowledge and competence (cultural self-awareness, knowledge of cultural worldview frameworks, empathy, verbal and nonverbal communication, curiosity, and openness) (AACU, 2009a; Bennett, 2008). The IKCVR has been adapted and used to assess intercultural knowledge across a range of classroom settings, including an undergraduate course in microbiology (Vemu et al., 2020), a first-year technology course for undergraduate students in the sciences, technology, engineering, and mathematics (Akdere et al., 2021), an undergraduate engineering course (Render et al., 2018), and an undergraduate health professions course in a short-term study abroad program (Richards & Doorenbos, 2016).

Guided by the IKCVR, public health instructors in two universities, one in the United States and one in the United Kingdom, sought to determine if their undergraduate students would experience a change in their intercultural competence and sense of belonging in a global community after exposure to a technology-based educational intervention: a 7-week COIL unit. The purpose of the COIL unit was to help students explore and critically analyze global health issues relating to the provision of healthcare and other challenges with healthcare systems. The COIL unit utilized introductions through Google MyMaps, a cultural geography assignment on Padlet, peer interviews to understand perspectives on healthcare systems in another country, written reflections, proposed plans for enhancing their own healthcare systems, and individual presentations (details about the COIL unit are under review in a separate publication).

Method

Study Design and Procedures

This study used a quasi-experimental pretest/posttest design with online surveys. The pretest survey was administered during Week 1 of the 7-week COIL unit and the posttest survey after completion of the unit. Students were provided a link to the survey via an online course management system (U.S.) or via email (U.K.).

Participants

The two schools collaborating on the COIL unit were a midsize regional comprehensive university in the midwestern U.S. and a large university in the central United Kingdom. The COIL unit was focused on comparison of international healthcare systems in two undergraduate courses, a consumer health education course (U.S.) and a global health course (U.K.). At the U.S. institution (where an undergraduate degree is completed in 4 years), students enrolled in the course are typically 3rd- and 4th-year students, though 2nd-year students can enroll. At the U.K. institution (where an undergraduate degree is completed in 3 years), students are typically 1st- and 2nd-year students. The combined enrollment for the two courses during the fall term was 50 students. The response rate was 76% ($n = 38$) for the pretest and 60% ($n = 30$) for the posttest.

Measures

The pretest and posttest online surveys (10 and 22 items, respectively) consisted of a mix of quantitative and qualitative self-report questions. Both surveys were administered as assignments in the course; no demographic questions were included. For the pretest, questions were designed to assess students' existing knowledge of COIL and cultural geography, including six questions aligned with the concepts of the IKCVR. For the posttest, students were asked the same 10 questions included on the pretest plus additional questions about what they learned and their overall learning experience.

Specific to the concept of "belonging" addressed in this study, the instructors used the IKCVR (AACU, 2009a) to develop a question to assess knowledge of cultural worldview frameworks as a variable. Central to such knowledge is an understanding of things important to another culture (AACU, 2009a). By understanding another culture and comparing similarities to and differences from their own cultures, students have a foundation for connecting to that culture and developing a sense of belonging in a global community. To assess changes in knowledge of cultural worldview frameworks, students were asked both before and after the COIL unit, "How would you describe your level of knowledge about what is important to people from other cultures (e.g., their history, values, politics, communication styles, economy, or beliefs)?" and were provided with four response options (*don't understand*, *somewhat understand*, *adequate understanding*, *sophisticated understanding*) that gauged their self-perceptions of the variable. In addition, students were asked to rate how strongly they agreed or disagreed that various technology-based learning approaches contributed positively to their overall experience with the COIL unit.

Statistical Analyses

Descriptive statistics were used to summarize perceptions of study participants. Pre- and posttest scores on the knowledge of cultural worldview frameworks (possible range of 1–4; theoretical mean of 2.5) were calculated. A *t* test was used to identify significant changes in the variable from before to after participation in the COIL unit. Cohen's *d* was used to determine whether the changes in magnitude were small ($d = 0.2$), medium ($d = 0.5$), or large ($d = 0.8$) in effect.

Results

Thirty students completed both the pre- and posttest surveys. After completing the COIL unit, all participants reported at least some understanding of other people's cultures, with 83% of participants reporting an adequate or sophisticated understanding of others' cultures, an increase of 39% from prior to the COIL unit (Figure 1). This change in students' knowledge of cultural worldview frameworks was significant between the two timepoints (pretest $M = 2.50$, $SD = 0.68$ vs. posttest $M = 2.93$, $SD = 0.52$, $p < .001$) with a moderate effect size ($d = 0.560$). Of the technology-based learning activities, students indicated the following had the most impact on their COIL experience (Figure 2): learning about healthcare in a different country (83.3%); getting to know someone from another country (80%); cultural geography Padlet assignment (70%); and cultural tour MyMaps assignment (47%).

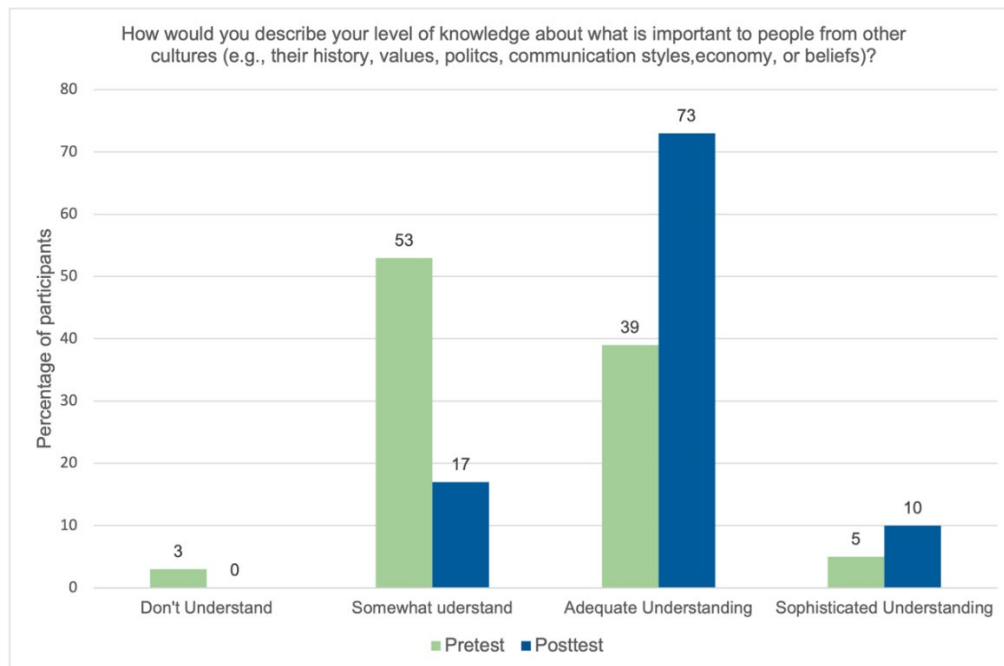


Figure 1. Change in students' knowledge of cultural worldview frameworks.

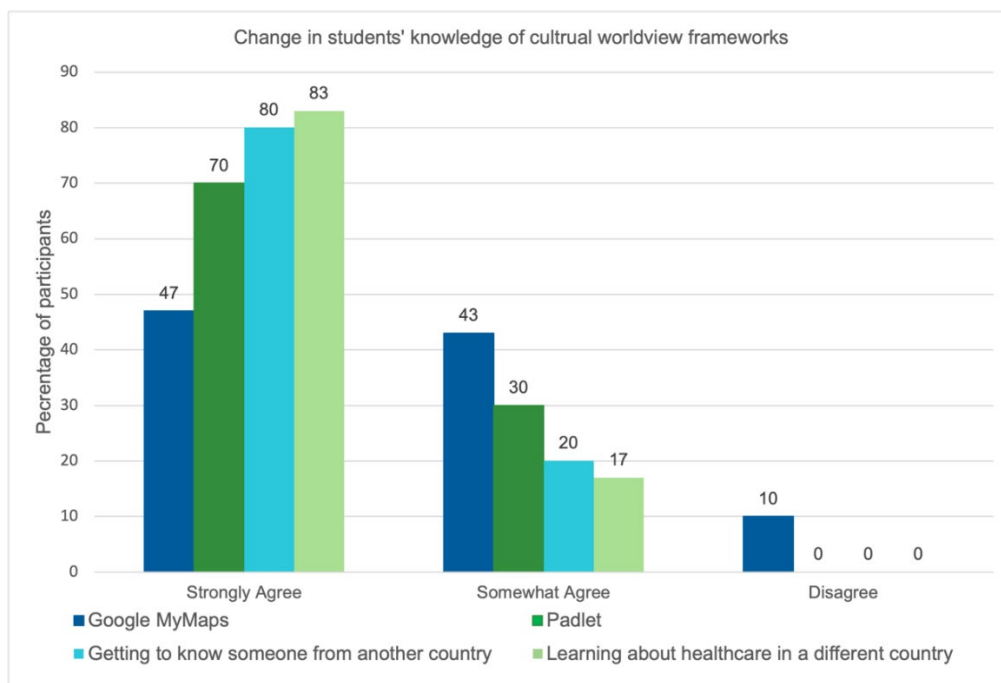


Figure 2. Percentage of students agreeing that various technological components of the Collaborative Online International Learning unit contributed positively to their learning experience.

Discussion

Internationalization is important for building intercultural competence (Deardorff, 2006), and COIL provides short-term (or longer) cross-cultural learning experiences that can be useful in all types of

higher education settings. As the global population becomes more diverse, interpersonal and intercultural competency development is an essential skill that can aid in areas of teamwork, cooperation, effective communication, navigating cultural differences, resolving conflicts, and negotiating shared goals. Using COIL as a bridge to develop intercultural competence is highly valued in today's interconnected world and prepares students for future professional and personal endeavors (Leung et al., 2014).

Richardson and Swan (2003) purported that online learning, and specifically COIL, can enhance belonging and congruence among diverse groups of students. The results of our educational intervention support their position. Furthermore, a COIL intervention can help participating universities meet accreditation standards and support their educational goals. Researchers have advocated for the use of COIL and the IKCVR to integrate intercultural knowledge and competence into public health and other degree programs to promote a sense of connection and belonging in a global community among undergraduate students (AACU, 2009a, 2009b).

The aim of the current study was to assess whether participation in a COIL unit could enhance a sense of global belonging/community for undergraduate public health students via changes in their intercultural competence. From before the COIL unit to after it, undergraduate public health students from the two collaborating universities in the United States and United Kingdom experienced significant changes in their knowledge of cultural worldview frameworks, with 100% of participants reporting at least some understanding of other people's cultures and most reporting more depth of knowledge. This aligns with findings that COIL is highly beneficial to undergraduate students' development in intercultural competence through virtual collaboration (Appiah-Kubi & Nichwitz, 2020; Hackett et al., 2023). As intercultural knowledge and competence is an imperative for people seeing themselves as members of a world community (AACU, n.d.), it makes sense that student knowledge of cultural worldview frameworks, or understanding others' cultures, can influence their intercultural competence and, ultimately, their sense of global belonging.

The use of the IKCVR was integral to the students' learning outcomes. It informed the design of the COIL unit, guided the selection of the variable being measured (knowledge of cultural worldview frameworks), and provided a conceptual framework for interpreting the results in the context of intercultural competence and belonging. This approach ensured that the study was grounded in established principles of intercultural competence, making the results meaningful and relevant within the context of the rubric's goals. The study measured students' knowledge of cultural worldview frameworks before and after the COIL unit, and the findings show a significant improvement in this aspect of intercultural competence. Taking part in the COIL unit provided students opportunities to build a sense of belonging through community networking, culture, acquiring knowledge, and collaborating with peers.

Previous research has shown that participation in technology-based learning is positively associated with a higher sense of belonging among college students (Long, 2016). One central aspect to creating a sense of belonging is the ability to engage and develop connections (Berry, 2019). COIL environments can be used to promote student engagement and connections by providing a safe environment for students to communicate and share experiences. In this study, use of technology for collaborative assignments was effective in helping undergraduate students learn about healthcare in a different country and getting to know someone from another country. Participants reported that the use of web-based tools (i.e., Padlet and MyMaps) contributed positively to their COIL experience. The assignments using these tools were designed to help students initiate and establish collaborative relationships with their peers at home and in the partnering international university by providing a virtual space to learn from others while also sharing details about their own cultural geography via images and maps. Faculty should strive to integrate technology, including high-impact practices such

as COIL and web-based tools, for the purpose of developing intercultural competence and promoting a sense of belonging in a global community among today's undergraduate students.

This study has limitations that may limit the generalizability of its finding to other populations or settings. The design was quasi-experimental as there was not a control group for comparison. The time between the surveys was relatively short (7 weeks) and long-term impacts were not assessed. The data were self-reported and consisted of students' perceptions, which may not accurately reflect the students' actual level of intercultural competence. All students were majors or minors in public health, and similar findings may or may not be found in students from other degree programs. With a small sample size and demographic information not part of the evaluation, researchers were not able to determine if there were any differences based on demographic factors. As such, the findings of this study may not be generalizable to other classes, students from other degree programs, or students from diverse backgrounds. Future researchers should consider long-term impacts on students, the use of a control group, and the collection of demographic data to improve the study design.

There are several potential research innovations that could be explored to further assess the impacts of COIL and technology-based learning interventions on the sense of belonging in the global community and higher education. Allen et al. (2021) suggested that conducting multilevel research is essential for understanding the social, neural, immunologic, and behavioral processes associated with belonging. To gain a deeper understanding of the long-term effects of COIL and technology-based learning interventions on students' sense of belonging, researchers could conduct longitudinal studies (Hackett et al., 2023). By collecting data from undergraduate students at multiple points throughout their academic careers, researchers could determine whether their sense of belonging changes as a result of participating in COIL interventions.

Comparing COIL outcomes to outcomes from other learning experiences could provide a rich vein of research. When it comes to cross-cultural learning, some researchers have stated that COIL cannot replace the experience of full immersion in a different country (Liu & Thomas, 2021). Other researchers have suggested that new technologies, such as virtual reality and augmented reality, provide authentic and engaging learning environments while fostering connection and presence among participants (Buchner et al., 2022). Comparing how participation in COIL versus participation in other learning experiences (e.g., short-term study abroad, long-term exchange, and new technologies) affects the sense of belonging is recommended. Modifying and adapting COIL to further enhance a sense of belonging among participants should be explored.

As technology and educational practices evolve, new approaches and methodologies may emerge to further assess the impacts of COIL and technology-based learning interventions on a sense of belonging among undergraduate students. Exploring COIL in different cultural contexts could help identify any cultural variations in the outcomes and inform the development of more inclusive approaches (Asojo et al., 2019). Considering socioecological perspectives and the intersectionality of students' identities and experiences can provide insights into how different factors affect the learning experience and sense of belonging (Johnson, 2022). Social network analysis techniques can be applied to examine the influence of COIL interventions on the formation of social connections and networks (Saqr et al., 2018). Overall, future research could help shed light on the potential of COIL and technology-based learning interventions to promote a sense of belonging among undergraduate students in the global community and higher education.

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