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Fostering Teaching Skills and Collaboration in an Online Graduate Teaching Fellowship

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Abstract

Fellowships represent an important mechanism for graduate students to develop their teaching skills and reflect on their career goals, given the inconsistent nature of graduate instructor training in higher education. We developed an online fellowship program focused on digital teaching and learning that offered workshops, mentored cohort experiences, and collaborative development of participant deliverables on a teaching and learning topic. In the 2022 year of this fellowship, we used participant reflections and survey responses (n=17) to evaluate the impact of our fellowship on students' teaching skills and the impacts of the digital collaborative components of the fellowship on their professional development. We found that students reported improvement in their teaching self-efficacy and pedagogical skills. Regular interactions with interdisciplinary cohorts and teaching mentors through the Microsoft Teams platform were reported as helpful experiences by most participants. However, additional structure in their cohort meetings and guidance for use of the digital tools in the fellowship are needed for some participants. We report on changes we will make to the fellowship moving forward to impact students' teaching skills and collaborative experiences.

Key words: online fellowship, digital learning, collaborative components, interdisciplinary cohorts, graduate instructors

Introduction

Graduate student instructors play an important role in undergraduate course instruction (Fong et al., 2019); however, research indicates that graduate degree programs often do not adequately prepare students with skills for online teaching (Bishop-Monroe et al., 2021). To address this gap, graduate fellowships serve as essential resources for graduate students, offering opportunities to enhance their pedagogical expertise, expand their knowledge, and improve their career prospects (Bishop-Monroe et al., 2021; Baran, 2016; Hokanson et al., 2019). While varied, these fellowships share features with more general educator professional development such as learning communities, workshops, or peer groups, often including workshops or webinars to present content knowledge, interactions with others at similar career stages, and connection to mentors or facilitators with strong pedagogical content knowledge (Carroll & Mallon, 2021; Gilmore et al., 2014; Glowacki-Dudka & Brown, 2007). We describe in the introduction key features of graduate fellowships for teaching professional development, how a Community of Inquiry framework can guide these programs, and the background of our case study that contributes to this research through evaluation of an online graduate fellowship focused on digital teaching and learning.

While there is somewhat limited research on graduate students' professional development in regards to their teaching skills, and on graduate fellowships in particular, there is evidence to draw from in creating effective fellowship programs. One important feature of graduate fellowships is the active engagement of peers and mentors, which fosters professional growth through idea and strategy sharing (Baran, 2016; Bishop-Monroe et al., 2021; Hokanson et al., 2019; Saucier et al., 2021). Engaging in discussions that incorporate multiple disciplinary perspectives deepens graduate students' understanding of pedagogies (Beaumont, 2020; Bishop-Monroe et al., 2021). Thus, interaction with peers and receiving comments are particularly engaging for graduate students (Hokanson et al., 2019). In addition to feedback sharing, the small group size setting in fellowships promotes conversations, increasing participation and fostering a stronger sense of belonging among members (Carroll & Mallon, 2021). These benefits create an environment where graduate students feel safe and comfortable expressing themselves (Annon et al., 2018). Engaging with digital literacy pedagogies within the framework of graduate fellowships allows graduate students to develop a deeper sense of agency (Hobbs & Coiro, 2019) and gain confidence in teaching (Hobbs & Coiro, 2019; Jonnalagadda et al., 2022).

The convenience of access is another important feature of graduate fellowships. The combination of Zoom meetings for synchronous interactions and the availability of recorded sections for asynchronous access increases the effectiveness of graduate fellowships (Saucier et al., 2021). The use of online platforms provides flexibility for participation and learning, allowing graduate students to accommodate their schedules and preferences while enhancing the fellowship experience (Saucier et al., 2021). The COVID-19 pandemic has led to a rapid shift towards online education, making it crucial for graduate students to enhance their teaching skills and pedagogies in digital literacy (Bishop-Monroe et al., 2021; Saucier et al., 2021). While extensive research exists on online teaching professional development in a K-12 context (Bragg et al., 2021), fewer case studies or evaluations of online graduate professional development exist (e.g., Hokanson et al., 2019), particularly following the sustained rise in online experiences following the COVID-19 pandemic.

The Community of Inquiry (CoI) framework is designed to create optimal online course environments (Garrison et al., 1999), but can also be applied in guiding online professional development for graduate students. The elements of CoI are cognitive presence, social presence, and teaching presence (Garrison et al.,1999). Cognitive presence is a four-part process of inquiry through which students construct meaning. It requires fellowship participants to engage in discourse and reflection as they progress from a triggering event through exploration, integration, and resolution. A triggering event presents participants with information that sparks their curiosity to learn more or resolve a problem. Students then build their knowledge through exploring learning content, integrate that knowledge to develop a coherent idea or understanding of a concept, and resolve it through engaging in action that demonstrates that they can apply their understanding in a new situation (Garrison et al., 2000; Garrison & Arbaugh, 2007). Social presence refers to a student's opportunities to present their personal characteristics as "real people" in the course community. As a fellowship experience progresses, social presence should grow from identifying with the community (through a shared sense of purpose in their fellowship), to communicating purposefully in a trusting environment, and eventually developing interpersonal relationships (Garrison et al., 2010). Teaching presence is made up of three dimensions: design, facilitation, and direct instruction (Garrison et al., 2010). Design is inclusive of the selection, organization, and presentation of content, learning activities, and assessments. Facilitating discourse requires facilitators to manage questions, reflections, and discussion in a way that leads participants to construct meaning. Direct instruction refers to an facilitator's use of their content expertise to guide participants in developing and applying their understanding (Garrison & Arbaugh, 2007).

To address the gap in research on online graduate professional development experiences focused on teaching, we provide a case study description and evaluation of an online graduate teaching fellowship focused on digital teaching and learning, reflection, and professional development. We detail the structure of our fellowship and relate its components to the CoI framework. We present student pre- and post-survey results of teaching self-efficacy and written reflections to demonstrate key components of an online fellowship that contribute to participants' collaboration and achievement of their professional goals.

Collaborative Context: COLA Fellowship

The COLA fellowship was developed by faculty at Michigan State University's (MSU) Enhanced Digital Learning Initiative (EDLI) to promote students' pedagogical skills in digital instruction and professional development as scholarly instructors. EDLI works on research, evaluation, and implementation of digital pedagogies at MSU. The COLA fellowship is a twelve-week summer experience for students from the three colleges involved in EDLI: the College of Arts & Letters, College of Natural Science, and Broad College of Business. Participants receive a $1,000 stipend for their engagement in the program.

Data for this paper was derived from the 2022 COLA fellowship, which was the third year of the fellowship's existence. The fellowship took place fully online, with synchronous and asynchronous options for engagement. Students focused on a different task each month. In June, they gained pedagogical knowledge and skill practice via workshops. In July, students created two digital teaching and learning deliverables, such as course modules, syllabi, and teaching

philosophies. Participants completed peer review of others' deliverables and presentations of their own work in August. Students were given a "COLA Roadmap" that outlined their major tasks to complete each month (Supplement 1). Students were divided into interdisciplinary cohorts based on their scheduling availability and meeting preferences (including frequency and modality of meetings), with 3–5 students in each cohort. A similar process was used to assign a teaching mentor from the EDLI team to each cohort. EDLI teaching mentors were all academic staff who had in-class instruction experience and experience as education researchers or instructional designers.

Digital Collaborative Tools

Microsoft Teams was used as the primary point of information sharing, question and response forum, and file sharing. Participants were added to a Teams channel for all prior and current COLA fellows, and were then added to two private Teams channels: one for all 2022 fellows, and a second one with their cohort groups. Schedule information and workshop registration links were cross-posted in Teams and on the COLA website (https://cola.commons.msu.edu). We selected Teams based on feedback from prior participants that there were too many sources of information and content for fellowship materials; in prior years, the Desire2Learn learning management system, Teams, the COLA website, Google drive, and email were all points of contact and information sharing. Teams was chosen because of its free availability to MSU students, ability to create channels for the full fellowship team as well as each cohort group, custom notification settings for each user, file sharing capabilities, and ability to create threaded discussions for ease of information sharing and questions and responses.

Full fellowship meetings and workshops took place using the Zoom platform. While Teams offers the ability to meet, the university workshop registration system uses Zoom as a platform. To maintain availability for COLA workshops to non-fellows, we elected to use Zoom for our meeting platform. Each cohort team was responsible for deciding when to meet and what platform to use for cohort meetings. Many fellows also used Google Drive to compile their own portfolios and share their materials for peer review.

Workshops

Six workshops were offered to develop pedagogical knowledge and scholarly teaching identity: 1. cultivating a reflective practice; 2. multimodality overview and course design; 3. facilitating student motivation in learning; 4. student engagement and classroom management; 5. fostering accessibility, equity, and inclusion in online classrooms; and 6. crafting and managing digital portfolios. Five of the workshops were offered as synchronous online sessions. Accessibility, equity, and inclusion in online classrooms was designed as an asynchronous workshop. All of the synchronous workshops except for crafting and managing digital portfolios were also recorded and their content was developed into asynchronous modules. Workshops were 90 minutes long and designed to be interactive, with breakout rooms, group report-outs, worksheets, and examples in the context of online and digitally-enhanced instruction of undergraduates.

Cohorts

Student cohorts were encouraged to meet at least monthly and up to weekly. Assigned meeting discussion topics included ice breakers, reflection questions on participant's individual

experiences, reflection questions on workshop content, and goal setting. Teaching mentors were encouraged to attend cohort meetings or separate meetings with the fellows monthly. Mentors were tasked with answering questions, providing resources, and offering feedback on students' deliverables.

Materials and Portfolios
Students were tasked with developing two deliverables on a topic of their choice related to digital teaching and learning. They were provided with example deliverables from prior fellows, which included course modules, teaching philosophies, and professional digital portfolios. Students were also asked to write brief reflections on their experience in each workshop and their main takeaways for impacting their teaching practices.

Participants compiled these materials into a portfolio to be shared with the fellowship facilitators and at an end-of-fellowship "Gallery Walk." The Gallery Walk was an online meeting where students walked through their portfolio presentations in breakout rooms with a small group of participants. Students shared their portfolios in various formats, including Google Drive folders, slide presentations, and personal websites.

Methods

This case study utilized student pre- and post-surveys and reflection writings to explore features of an online, collaborative graduate teaching fellowship that relate to students' experience of a digital collaborative fellowship experience and improvement of their teaching skills. Teaching self-efficacy was analyzed using t-tests and we conducted thematic content analysis on qualitative survey responses and students' final reflections from the program.

Surveys
The pre-survey was distributed at the beginning of the COLA fellowship program. It contains questions regarding the participants' demographics, their prior college-level teaching experience categorized by different modalities, participation in other teaching-focused professional development programs at MSU, and the teaching self-efficacy measure, adapted from the Ohio State Teacher Efficacy Scale (Tschannen-Moran & Woolfolk Hoy, 2001) to reflect the participants' self-perceived teaching efficacy for teaching in each specific modality (face-to-face, online). The measure consists of ten to eleven items for teaching in each specific modality. Each item describes a teaching behavior or competency. Sample items include, "To what extent can you craft good questions for your students?" and "How much can you do to motivate students who show low interest in the coursework?". Participants were asked to respond to the prompt "How much can you do?" on a 9-point Likert scale with "1" representing "nothing" and 9 representing "a great deal."

The post-survey was distributed at the end of the COLA fellowship program. Besides the teaching self-efficacy measure, the post-survey also asked open-ended questions about how their mentored cohort experience was helpful or could be improved and general suggestions for future COLA fellowships. We conducted paired sample t-tests to analyze the results from the teaching self-efficacy measure from the pre- and post- surveys, with a separate t-test used for each of the following groups: students with prior face-to-face teaching experience and students with prior

online teaching experience. We used descriptive statistics to compare changes in self-efficacy from students with no prior teaching experience.

Reflections

Students were asked to submit reflection papers on their fellowship experience exploring at least four of eight prompts. The eight prompts related to: overall experience, changes in teaching, challenges in creating deliverables, remaining questions, experiences with cohorts, biggest takeaway, and future improvements.

Reflections and qualitative survey responses were analyzed as a group via thematic content analysis. Two authors read through the responses to develop themes (I.C.T. and M.Z.), then coded three responses to determine interrater reliability in identifying the same themes across respondents. Reliability was established using the kappa statistic in Stata version 17, with a value of 0.81 and 92% agreement (StataCorp, 2021). The initial coders met with a third author (C.K.K.) to reach consensus on differences and finalize the codebook. The initial two coders then each coded seven of the remaining responses.

Participants

Graduate students were recruited to COLA via emails from their department or college administrators. Twenty-five students applied and were accepted to the program. Here, we report on the 21 participants who provided their demographic information and prior teaching experiences through the self-reported pre-survey. Out of the 21 participants, three were master's students; seventeen were doctoral students, and one student did not specify their degree level. Fourteen out of the 21 participants reported having prior teaching experience in the face-to-face modality. Thirteen reported having prior teaching experience in the online modality. Seven reported having prior teaching experience in the hybrid or HyFlex modality. Two reported the question as not applicable or them not having any prior college-level teaching experience. Eight out of the 21 participants reported having taken part in other teaching-focused professional development programs at MSU, while the remaining thirteen reported without any prior engagement in such professional development programs. Participants' self-reported demographics are as follows (see Table 1.1):

Table 1.1

Descriptive Statistics of Participants' Demographics

	N = 21	
Variable	**Frequency (n)**	**Percent (%)**
Age Group		
21-25	4	19.0%

26-30	14	66.6%
31-35	1	4.8%
36-40	1	4.8%
41-45	1	4.8%
Gender		
Male	5	23.8%
Female	13	61.9%
Non-binary	3	14.3%
Ethnicity		
White/Caucasian	6	28.6%
Black/African American	3	14.3%
Hispanic/Latino origin	3	14.3%
Asian/Asian American	7	33.2%
Two or more ethnicities	1	4.8%
Other	1	4.8%

Limitations

Our small sample size should be considered when interpreting the results of this study, both qualitatively and quantitatively. While it presents challenge for generalizing our findings to other programs or to future cohorts in our fellowship, we the study size is sufficient for exploring the impacts on our participants from the studied year of the fellowship.

Results and Discussion

Analyzing participant surveys and reflections allowed us to reflect on the success of our online

teaching fellowship in its development of students' teaching self-efficacy and on their experience in a collaborative online program.

Impacts on Teaching Skills

We analyzed both students' pre- and post-survey teaching efficacy measures and their reflection writings (n=17) to determine the impact of the fellowship on their pedagogical skills. In analyzing teaching self-efficacy, paired sample t-tests were conducted on three groups: students who reported prior teaching experience in face-to-face contexts, those with prior online teaching experience, and those with no prior teaching experience. Here are the results from paired sample t-tests:

Teaching Self-Efficacy in the Face-to-Face Context. There was a significant increase in the teaching self-efficacy for the face-to-face context as reported by the 11 participants after the summer 2022 COLA program (mean = 7.07, Variance = 0.50) compared to the beginning of the program (mean = 6.22, Variance = 0.89), $t(10) = 3.55$, $p < .05$. Note that the eleven participants were those that reported having prior teaching experience in the face-to-face context and also filled out both pre- and post- surveys.

Teaching Self-Efficacy in the Online Context. There was a significant increase in the teaching self-efficacy for the online context as reported by the 14 participants after the summer 2022 COLA program (mean = 6.93, Variance = 0.82) compared to the beginning of the program (mean = 6.21, Variance = 1.36), $t(13) = 2.25$, $p < .05$. Note that the fourteen participants were those that reported having prior teaching experience in the online context and also filled out both pre- and post-surveys.

Teaching Self-Efficacy of Those Without Prior Teaching Experience. There were only two participants without any prior teaching experience at the college level who completed both surveys. Due to the small sample size, we deem it was not sufficient to run a paired sample t-test for this group. However, at the beginning of the COLA fellowship, their teaching self-efficacy was: mean = 6.8, Variance = 6.48; at the end of the COLA fellowship, their teaching self-efficacy was: mean = 8.35, Variance = 0.41.

Reflection Responses on Teaching Skills. Seventeen participants completed the post-program survey and consented for their reflections to be used for research analysis. The post-survey questions asked specifically about students' experiences with their cohorts and mentors, and reflections asked students to respond to at least four of eight prompts related to: overall experience, changes in teaching, challenges in creating deliverables, remaining questions, experiences with cohorts, biggest takeaways, and future improvements. Thematic coding demonstrated that 16 of the 17 respondents reflected on how the fellowship impacted their teaching professional development. Participants detailed: improvement in teaching skills and content knowledge (n=15), greater confidence in their teaching abilities (n=5), and greater enthusiasm for teaching (n=2).

Across all three of these subthemes, students most often linked their professional development to the five COLA workshops. When sharing about their improved teaching skills and

content knowledge, participants often listed specific ways that they would integrate the content into their teaching practice. For example, one student shares their new approach to accessibility in course design: "I bring a new belief to my teaching this fall: that designing for accessibility rather than retrofitting activities to be accessible yields a better outcome for my students and promises a more efficient teaching experience for me." Another student discusses their plan to operationalize their understanding of student motivation: "The student motivation workshop helped me think through some opportunities to engage them, specifically through providing student agency and allowing them to feel like they are actively learning." Some responses were less specific about the source of their skill improvement, enthusiasm, or confidence, attributing them to the fellowship in general, such as:

> I believe, one of my biggest takeaways from this experience with COLA is the realization how much I enjoy teaching, and how much I enjoy interacting with others. It made me excited for my position as a TA and I cannot wait to step into a classroom again; virtually or in-person.

By referring to interacting with others, this student is likely describing some of the collaborative components of the fellowship that influenced their enthusiasm.

Students who reported increased confidence in their teaching included those who had taught before and those without prior teaching experience. One respondent describes how they were able to integrate the knowledge in COLA with their past teaching experiences:

> I found my footing throughout my time teaching, but was always worried about if I was doing the right things in the eyes of my students and the professor I worked under. The COLA program helped me put words/phrases to concepts I picked up during my teaching experience and reassured me of aspects of my teaching that I hoped would be useful to students.

The pedagogical knowledge that this student gained through the COLA fellowship caused them to reflect on their teaching practices and reassured them that their approach to teaching was valid.

Participants' improvement on their teaching self-efficacy scale and their reflections on their teaching skill improvements are two indicators that our online collaborative program was effective in developing pedagogical skills. In a meta-analysis, teaching self-efficacy was shown to be strongly related to instructors' teaching effectiveness as determined by observational evaluations and student performance (Klassen & Tze, 2014). Many students listed specific pedagogical skills and takeaways that they would implement in their courses, suggesting that they successfully retained the information shared in the fellowship. A few students also indicated that their confidence in teaching improved. Providing pedagogical knowledge is a key component of graduate fellowships to impact teaching, especially given that teaching professional development is not a consistent component of graduate education in most programs (Agarwal et al., 2020; Gilmore, et al., 2014). Many teaching professional development programs provide content knowledge in a similar format, via webinars and workshops over a series of several weeks (Brancaccio-Taras et al., 2016; Carroll & Mallon, 2021). In a similar graduate professional development program, participants noted that their confidence was improved because the program included feedback from peers and faculty mentors (Jonnalagadda et al., 2022), highlighting the potential importance of professional development content that is not only pedagogical in nature. The combination of our workshops with students' creation of their own deliverables is intended to guide students through the full cycle of cognitive presence as described

in the CoI framework, with workshops providing triggering events that spark participants' curiosity and their creation of deliverables allowing them to integrate knowledge across workshops, outside sources, and their own experiences.

Impacts of Digital Collaboration on Fellows' Experiences

In addition to understanding fellows' skill improvement, we wanted to explore how well the digital collaborative components of the fellowship contributed to their overall experience and professional development. Participants reported this through their general reflections and direct open-ended questions on the post-survey about their interactions with their cohort and mentor.

Positive Aspects of Digital Collaboration. Twelve of the 17 respondents indicated that having a teaching mentor was a positive experience, indicating a measure of teaching presence in the fellowship. Specific positive aspects of mentorship included motivation for engagement, individualized guidance, and feedback on students' progress and deliverables. One student said of their mentor, "She was extremely motivational, and always made sure that I knew I was doing enough and allowed to work at my own pace." Another shared that "My mentor was very helpful regarding giving feedback, suggestions and encouragement!" Ten respondents indicated that their cohort was helpful. Nine respondents indicated in their reflections that they benefited from interactions with others in the fellowship, inclusive of their mentor and cohort. Specific benefits of interactions were similar to those that marked a strong mentor relationship, such as maintaining students' sense of engagement and receiving feedback: "Having cohorts aided in keep (*sic*) my attention and also being able to share what my thoughts were without being intimidated by a large audience."

The multidisciplinary nature of the fellowship was also a positive experience of collaboration for many fellows (n=10). One student said, "It was valuable to interact with students that come from different experiences and bring different perspectives to their educational styles so that we could share and steal different strategies and techniques from each other." These interactions with interdisciplinary fellows also represent a component of social presence.

Challenges of Digital Collaboration. Participants identified challenges in the COLA fellowship that impacted their experience and made recommendations for improvement to the fellowship. These fall into three broad categories: cohort structure and interaction, mentor support and interaction, and general COLA structure and recommendations.

Cohort Structure and Interaction. Four participants reported that their cohort members were less involved in meetings and interactions, such as: "In general, I don't think my cohort-mates were very engaged." Two participants reported their own lack of engagement with their cohorts: "I definitely engaged more asynchronously and lost out with a lot of opportunity for contact with my other cohort members...I could have been more helpful to me if I'd made more out of it." In all cases, lower interaction with cohorts was identified as having a negative impact on the value of the fellowship.

Ten participants offered suggestions on improving the cohort structure and interaction. Suggestions included ways to introduce more structure to the cohort meetings, such as "to have some prompts we could talk about and possibly report on," or "to maybe work on something

together rather than just our own deliverables." Participants also suggested ways to improve levels of engagement among the cohorts, such as having in-person sessions, sorting cohorts based on their expectations of involvement, or ensuring that more than one student from each discipline is in cohorts to provide some discipline-specific feedback. Eight of the 10 participants who suggested improvements for cohorts also indicated that their cohort was helpful, communicating the value of the cohort experience, and ability for the fellowship to build social presence, while recognizing opportunities for improvement.

Mentor Interaction and Support. Five participants reported inadequate interaction with their cohort mentors, and therefore inadequate teaching presence, and one reported no interaction with their mentor. Some participants detailed that their mentor was not communicating often enough, that they would have liked more meetings together, or that they had persistent scheduling conflicts. One participant indicated that the low interaction with their mentor was their own preference, stating: "I think I tend to take a more independent approach than what y'all envisioned."

General COLA Structure and Recommendations. Six participants mentioned other issues or suggestions for the fellowship. Most of these comments were related to the structure of the fellowship and requests for additional guidance, such as "I hope to see a more robust website or catch-all document that guides COLA Fellows through the program (and identifies places where workshops/reflections/artifacts might occur)." Building better structure into the informational components of the fellowship could improve students' experience of cognitive presence. A few participants described issues with technology, including issues with the Teams platform as the host of fellowship information, given that some students found "the Teams chat difficult to use and notifications were very finicky."

Based on student responses, the majority of participants experienced the mentored cohort structure as a positive aspect of the fellowship that contributed to their development of teaching skills. The smaller size of cohort groups allows participants to feel more comfortable raising questions and sharing their deliverables for peer review, as has been reported in other online fellowships (Carroll & Mallon, 2021). Social interaction with peers is a key component in similar professional development programs, linked to benefits that include greater understanding of pedagogical content knowledge, establishing a sense of community, increased student-centered teaching, and career exploration (Jonnalagadda et al., 2022; Saucier et al., 2021; Kern & Olimpo, 2022). It is also one of the three components of the CoI model and important to sense of belonging in online course experiences (Richardson et al., 2017). Having a mentor to explicitly discuss teaching-related skills with is also key in developing students' teaching skills and orientations (Gilmore et al., 2014). Given that graduate students' primary mentors are often supervising their research and content knowledge, direct discussions of teaching are not guaranteed in those relationships, and a mentored teaching model is important in fellowship and professional development programs for graduate instructors (Baran, 2016). The mentors' presence as facilitators in workshops and cohort meetings also contributes to a stronger teaching presence, providing both direct instruction and facilitation of participants' questions and learning experiences. However, the specific structure of the COLA cohort, mentor relationships, and overall fellowship were not productive for some students. This is related to many challenges also

experienced in online courses, where students can struggle without clearly defined structure and may struggle to feel connected with their peers (Jones-Roberts, 2018; Raes et al., 2020). Another professional development program reported on by Bishop-Monroe et al. (2021) had similar challenges in participants lacking a sense of community, though their program was only five weeks long compared to our 12-week fellowship. The additional length of our program offers more time for creating a sense of community among students. Our finding that some participants had difficulty navigating the online nature of the fellowship and the Teams platform also aligns with Bishop-Monroe et al. (2021)'s suggestions that some participants need additional skill-building at the beginning of the fellowship to navigate the basic tools used in an online course or professional development experience.

Future Iterations and Recommendations

Reflecting on participants' responses and literature on development of pedagogical skills in graduate fellowships, we have developed changes that we will make to future iterations of the fellowship. We have integrated these results and changes into recommendations for fostering a collaborative online fellowship experience that contributes to pedagogical skills and development of a professional scholarly identity for graduate students.

We are maintaining the fellowship's general structure, which integrates a series of online workshops (offered synchronously and asynchronously), regular meetings with multidisciplinary cohorts of 3–5 students with an assigned teaching mentor, and requirements for students to create two self-selected deliverables related to teaching and learning. This overall structure appears to be effective in improving students' teaching skills and creating opportunities for meaningful connections with others. The creation of deliverables and a subsequent portfolio with reflective pieces is important for students' professional development and provides content they can use in their courses or in a portfolio for job searches and a professional digital presence. When combined with regular contact from the facilitation team, this structure successfully attends to cognitive, social, and teaching presences as described in the CoI framework (Garrison et al, 1999). We recommend that any graduate teaching fellowship include similar components for pedagogical content knowledge, connection with others, and opportunity to create teaching-related materials.

To improve the nature of the digital collaboration in this fellowship, we are making a few changes to the mentored cohort interactions and structure. First, we will bookend the fellowship with an initial hybrid (in-person and online) kickoff meeting and a hybrid portfolio presentation session. This will allow students to meet the fellowship facilitators and members of their cohort in-person if they are able to, which we hope will create a greater sense of community among the fellows. In 2023, we offered this hybrid option and about half of the fellows opted to attend the in-person event. We otherwise plan to maintain the online modality of the fellowship, both to enhance students' own online teaching and learning skills and to recognize the need for flexibility for graduate students, who are often away from campus during the summer for personal, financial, or professional reasons. Despite some challenges with the Teams platform, we are opting to maintain that as our digital home for the fellowship. We will emphasize its importance and provide additional resources to students for navigating Teams to ensure they are receiving appropriate notifications and able to view and access all fellowship materials. We also began the 2023

fellowship with a post that asked participants to post a GIF representing something they were looking forward to for the summer as a mechanism to begin social connections and ensure that all students had access to the Teams. At the 2023 kickoff meeting, we also had student cohorts initiate a Teams chat with their group members, which offers a simple, informal space for quick communication. We recommend that online graduate fellowships have a platform for sharing of files, informal chat messages, and formal communications from the program facilitators. We also encourage fellowship facilitators to foster opportunities for social connections at the beginning of the fellowship, whether that is through personal introductions and sharing in an online or face to face setting.

We are implementing additional structure to the cohort meetings. Initially, we allowed students to select their meeting cadence and topics as cohorts, and mentors were to meet with their cohorts at least monthly. Our more structured version of the cohort experience will involve bi-weekly meetings during the workshop phase of the fellowship, followed by weekly meetings throughout the creation of students' deliverables and peer review process. We will provide discussion questions to engage cohorts in conversation around their prior teaching experiences and challenges, takeaways from workshops they have attended, goal-setting for their deliverables, and feedback on their progress. Teaching mentors will attend each meeting to check in and participate in the discussions. We recommend that graduate fellowships include similar opportunities for meaningful, structured connections with others to promote maximum engagement from fellows, and that those interactions include peers and mentors with teaching experience.

Finally, we will continue to seek funding so we can provide graduate students stipends for engaging in this work to recognize their efforts and support them during the summer. Funding is an important mechanism for supporting graduate fellowship opportunities. Given the importance of supporting teaching skills for graduate students and the varied experiences graduate students receive in terms of professional development for teaching (Bishop-Monroe et al., 2021; Fong et al., 2019), we suggest that investment in quality fellowship opportunities for graduate students is an important step for colleges and graduate schools to take.

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