

## Online faculty's use of technology when advising doctoral capstone writers

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Inadequate or ineffectively communicated feedback from faculty advisors may limit the development of cordial, collaborative relationships with doctoral capstone writers and may impede their successful outcomes. The purpose of this general qualitative study was to explore online faculty's use of technology when advising doctoral capstone writers. Yang and Carless's (2013) feedback triangle model, including cognitive, social-affective and structural dimensions, provided the framework for the study. Demographic survey data and Zoom interview data were collected from 10 doctoral faculty at a fully online university to explore how and why faculty use technology and what technology-related activities faculty conduct when advising doctoral capstone writers. Emergent codes were organized using a priori codes from the feedback triangle model, and themes were developed within these dimensions. Cognitive themes were ensuring accountability and providing instruction, which addressed how participants were using technology. Social-affective themes addressing why faculty use technology were enhancing communication, increasing motivation and promoting self-regulation. Structural themes indicating technology-related activities were modes, preferences, procedures and barriers.

### *Implications for practice or policy:*

- Online faculty advisors may use technology more effectively to support doctoral capstone writers.
- Administrators of online doctoral programs may provide more appropriate technology support for faculty who are advising doctoral capstone writers.
- Online doctoral capstone writers may experience improved relationships with faculty advisors, which may promote successful capstone outcomes.
- Faculty advisors and doctoral students working in face-to-face environments may benefit from enhanced application of technology in virtual communication resulting from the COVID-19 pandemic.

Keywords: technology, online, faculty, advising, doctoral, writing feedback, qualitative

## Introduction

Doctoral capstone advising in the online environment requires additional effort in promoting a trusting relationship that nurtures a sense of belonging and connection (Gray & Crosta, 2018). Factors that undermine students' engagement include workload, lack of relevance of course content or activities, faculty's controlling expectations, lack of choice, time constraints and technology barriers (Hartnett, 2015). Technology can be used to facilitate more intensive, participatory relationships and may be helpful in promoting students' initiative, accountability and emergence as peers in the research process (Maor & Currie, 2017). However, Boulton (2019) cautioned that technology can impede learning if cultural and pedagogical issues are not considered. The current study addressed the technology tools online faculty are using and the ways in which these tools support the advising process with fully online doctoral capstone writers. In this study, *doctoral capstone* referred to the dissertation, doctoral study, project study, consulting capstone or multiple-article capstone completed near the end of a doctoral program in the social sciences.

## Background

Negotiation empowers graduate students to become collaborators in the feedback process and promotes development of their scholarly identity and voice (Odo & Yi, 2014). Dialogic feedback occurs as doctoral students take an active role in negotiating meaning with their supervisors and peers (Adams, 2018; Gonzalez-Ocampo & Castello, 2017). Schalkwyk and Jacobs (2021) described doctoral capstone writing as a site of tension in which students attempt to cross borders while faculty attempt to maintain borders.

Students often do not know how to respond to feedback discussions instigated by faculty (Y. Xu & Carless, 2017), and prior experiences with feedback may influence doctoral students' level of agency in responding to supervisor feedback (Inouye & McAlpine, 2017). In addition, inadequate or ineffectively communicated feedback may limit the development of cordial, collaborative relationships between doctoral students and faculty advisors, which may impede successful outcomes (Basturkmen et al., 2014; Carter & Kumar, 2017; V. Kumar & Stracke, 2017). Technology challenges and language barriers can also affect doctoral e-mentoring communication (Byrnes et al., 2019).

One way to improve feedback practices at the doctoral level is to enhance communication. Researchers have encouraged faculty to discuss their feedback practices with students to prevent misunderstandings from impeding learning (Dermol & Trunk Sirca, 2018; Gredler, 2018; L. Xu, 2016; Yuan & Kim, 2015). Dippre and Hellman (2013) recommended one-on-one conferences as the most effective way to enhance communication, promote dialogue and prevent misunderstanding of feedback. Gray and Crosta (2018) encouraged supervisors to discuss cultural differences with their mentees to ensure expectations are understood. Naomi (2021) argued that doctoral advisors should support non-Western students' voices to increase diversity and transform the capstone writing process. Some faculty have used interactive coversheets to communicate to students the importance of engaging with questions related to their writing and thinking (Bloxham & Campbell, 2010).

High-quality feedback delivered in a timely manner is a best practice among online doctoral faculty (Deshpande, 2017). Baltés and Brown (2018) found that additional early feedback at the capstone proposal stage resulted in faster approval for fully online students. The primary way online graduate students receive instruction is by text-based feedback (Basturkmen et al., 2014). In addition, audio feedback has been shown to provide students with bigger-picture elements that are more difficult to address in written feedback (Yang & Carless, 2013). With the ubiquitous nature of voice over Internet protocol (VoIP), more faculty are using screencasting and screen sharing for connecting with students. Portolese Dias and Trumpy (2014) found that students who received screencast feedback were more likely to think the instructor was genuinely interested in their learning. Odo and Yi (2014) also noted the benefits of videoconferencing to clarify feedback but warned that time pressure and technology management can be barriers to this practice.

Institutional factors can also be barriers to effective feedback practices. When institutional constraints impede the feedback process, instructors can mitigate these barriers through non-disciplinary resources such as technology (Costello & Crane, 2013; Yang & Carless, 2013). Researchers noted that computer-mediated feedback might help instructors identify tools that can be useful in feedback practices (Bissell, 2017; Tuffley & Antonio, 2015). Yang and Carless (2013) called for studies on technology-enhanced feedback practices, specifically ways in which technology might enhance rather than impede student learning without burdening instructors with a heavier workload. Training in giving and receiving technology-based feedback may enhance its benefits (Dermol & Trunk Sirca, 2018).

Although technology might provide ways to help doctoral students feel connected in fully online programs, research has shown that faculty are reluctant to use technologies that might enhance feedback. One reason is the time it takes to learn new processes and technologies; another is the uncertainty that the technology (inside or outside the organisation's learning management system) will be supported by the institution (Maor & Currie, 2017). A third issue is the time it takes for faculty to learn and implement the technology with students (Valeri, 2015). Faculty have shared tips and anecdotes regarding technology use to improve quality and structural elements of feedback in online spaces (Mullen, 2020; Valeri, 2015; Yuan & Kim, 2015). However, most of this research has been conducted with undergraduate students or second language learners. Research on the use of technology in the iterative process of online doctoral capstone advising was limited.

## **Purpose and framework**

The purpose of this general qualitative study was to explore online faculty's use of technology when advising doctoral capstone writers. We investigated how faculty use technology, why they prefer certain technology and what technology-related activities they conduct when advising doctoral capstone writers. The conceptual framework was Yang and Carless's (2013) feedback triangle model containing three dimensions: cognitive, social-affective, and structural (see Figure 1). These dimensions interact within the feedback space (Yang & Carless, 2013), which in the current study constituted a virtual space.

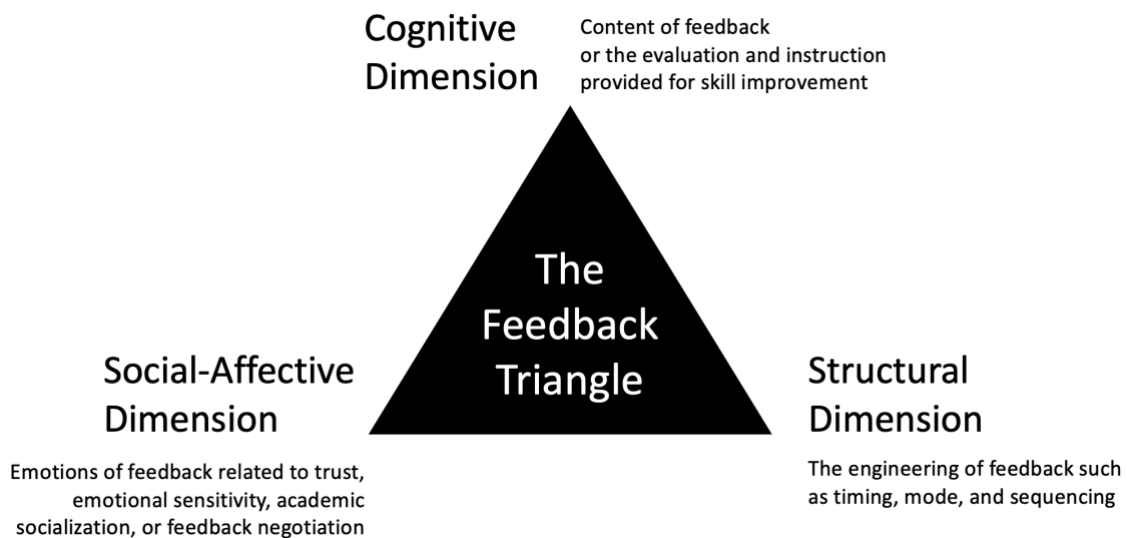


Figure 1. Three dimensions of the feedback triangle model. Adapted from “The Feedback Triangle and the Enhancement of Dialogic Feedback Processes” by M. Yang and D. Carless, 2013, *Teaching in Higher Education*, 18(3), 285–297. <https://doi.org/10.1080/13562517.2012.719154>

## Method

We chose a general qualitative approach to explore participants’ use of technology when advising doctoral capstone writers (see Percy et al., 2015). We used a questionnaire to collect demographic data and conducted audio-recorded individual interviews via Zoom. The scope was limited to faculty teaching in fully online programs at a private online university who had served as committee chairs or second committee members and had graduated at least one doctoral student. We recruited faculty from across the university with no preference for a college to promote a breadth of representation of the doctoral capstone advising process. Participants consisted of eight women and two men from five colleges in the university. The sample included administrators, full-time faculty, and part-time faculty from PhD and professional doctorate programs. Participants had between 5 and 25 years of experience and had graduated between two and 70 students. Because one of us had served on capstone committees, we mitigated researcher bias through reflexive journaling and bracketing of personal experience (see Moustakas, 1994). Although we had professional relationships with some of the participants, those relationships did not interfere with the objective collection and analysis of data. We were located in the United States of America at the time of the study, but we did not solicit participants’ locations. The study site is an international university with students and faculty members located around the world, so the study’s setting was not specific to one country. We obtained institutional review board approval from the study site university before collecting data. We also conducted member checking by asking each participant to review the results section of the manuscript to confirm their responses had been reported accurately. When describing findings, we used participant pseudonyms (e.g., P1, P2).

Data analysis was conducted in two steps. For Level 1 coding, we used Yang and Carless’s (2013) feedback triangle dimensions as a priori codes. Based on DeCuir-Gunby et al.’s (2011) recommendation, we predetermined how each dimension applied to the current study. The cognitive dimension aligned with how faculty are using technology, the social-affective dimension aligned with why faculty are using technology, and the structural dimension aligned with what technology-related activities faculty are conducting. During Level 2 analysis, we used Dedoose to identify emergent codes and assigned them to one of the a priori codes. Rather than conducting interrater reliability and coding separately, we chose to code collaboratively by analysing transcript data and discussing the application of existing codes or creation of emergent codes before moving to the next transcript item. Collaborative coding allowed us to defend our assessments and monitor interpretive gestures that may have introduced researcher bias. We also identified data beyond the scope of the study, such as those in which faculty discussed their roles outside the domain of committee chair or second member. Sometimes we used personal knowledge of the study site’s advising process to

understand what participants were reporting, but we made sure the application of institutional knowledge was appropriate and unbiased. We reached data saturation by the eighth interview; however, we chose to conduct two more interviews to confirm saturation (see Sim et al., 2018). Most of the interviews were conducted before the COVID-19 pandemic lockdown began in March 2020. However, data analysis and member checking occurred during the lockdown period. We were mindful not to allow the circumstances of the pandemic to influence data collection and analysis.

## **Findings**

We organised findings using Yang and Carless's (2013) feedback dimensions. Cognitive themes included ensuring accountability and providing instruction. Social-affective themes were enhancing communication, increasing motivation and promoting self-regulation. Structural themes were modes, preferences, procedures and barriers. During the coding process, we were able to situate each emergent code within one of the feedback dimensions. Except for data beyond the scope of the study, there were no outliers that were not reasonably coded within one of the dimensions. Table 1 presents the themes and categories found within each feedback dimension.

Table 1  
*Dimensions, themes and categories*

Dimension	Theme	Category
Cognitive	Ensuring accountability	Clarify expectations Ensure clarity Ensure quality Hold students accountable
	Providing instruction	Writing and APA Thinking Researcher skills Technology skills Use of resources
Social-affective	Enhancing communication	Boundary setting Dialogic conversations Peer interaction Overcoming challenges Trust or relationship building
	Increasing motivation	Celebration Humour Positive feedback Positive peer pressure Positive tone
	Promoting self-regulation	Envisioning the end Modelling scholarly professionalism Professional empowerment Promoting self-regulation Teaching life-management skills
Structural	Modes	Asynchronous low Asynchronous high One-to-many Synchronous low Synchronous high Visual aid
	Preferences	Equipment Member tech preference Perception of technology use Student preference
	Procedures	Committee procedures Document management Faculty workload management Focus on task Timing Tracking student progress
	Barriers	Organisation or program limitations Tech hinders Timing barriers

### Cognitive dimension

Yang and Carless (2013) described cognitive feedback as the content of feedback or that which addresses conceptual ideas, structural issues, task completion strategies or skills. In the current study, cognitive themes were ensuring accountability and providing instruction.

#### *Ensuring accountability*

When ensuring accountability, participants reported they use technology to clarify expectations, ensure clarity, ensure quality and hold students accountable. Participants use written communication via course announcements and emails to inform students they need to be receptive to feedback and willing to make frequent revisions to improve the manuscript. When necessary, participants escalate to phone calls or Zoom or Skype or Teams calls to clarify expectations regarding the writing and revising process, including term plans, due dates and turnaround times for feedback. Participants reported that when students know what kind of feedback to expect and when to expect it, they feel more confident in the relationship. Participants also encourage students to examine exemplary dissertations as a means of ensuring expectations are

understood.

Participants also reported using technology to ensure clarity of communication, especially regarding feedback. Most participants indicated they use Track Changes and Comments when providing feedback in Word documents. Participants also use email to obtain clarification from other committee members so students can understand the feedback that was given. When providing written feedback, participants emphasised the need to include sufficient detail to ensure comments are understood: “I try to give a lot more guidance knowing that I might not talk to them [students] about this on the phone for several weeks” (P2). Several participants schedule Zoom or Skype or Teams meetings so they can share screens and review feedback with their students.

Participants also use technology to ensure quality in students’ work. P3 noted: “I truly want the paper to be as good as it can be”. Some participants include a narrative summary of their feedback and return this with the document for revision. If there are several issues to address, participants schedule phone calls to motivate students to study and apply the feedback. Participants are also mindful of the need to reread comments to make sure the tone is not too harsh or blunt, which ensures accountability by increasing the likelihood of the feedback being received and implemented. In addition, participants encourage students to use software such as Grammarly and Recite to ensure quality. Some participants use the Compare Documents feature in Word to ensure feedback was addressed. If feedback is not addressed, participants often escalate to phone calls to discuss why.

#### *Providing instruction*

The most prominent area of instruction was writing, and the primary means of providing writing instruction was Word’s Track Changes and Comments. All participants reported using Word when providing feedback, and they expect students to understand how to read Track Changes and Comments. Several participants mentioned that they correct the first few errors and highlight others so students can fix them on their own: “I do not mark everything all the time because I tell them take what I’ve said and incorporate it into the rest of their paper” (P8). Some participants use only Comments while others include Track Changes to model clarity and concision. Participants also reported that although they try to identify items students are doing well, they focus primarily on areas of improvement because of limited time. Certain participants prefer to read a clean manuscript while others want Track Changes preserved. Participants are also mindful about dosing their feedback: “I don’t want to demoralise them [students]; sometimes they might overreact and get down when in fact its fixes aren’t that difficult” (P6). Some participants use tools such as TypeltIn to reduce typing time when inserting comments. Online group discussions are sometimes used to offer tips on proofreading and to encourage students to review each other’s work: “Sometimes peer learning and peer pressure is far more effective than a faculty member’s voice” (P1).

Another prominent area of instruction was thinking. Several participants noted that thinking instruction often occurs early in the process (i.e., prospectus) to ensure alignment among the problem, purpose, research questions and framework. P3 noted: “I tend to talk to them sort of higher level about understanding the structure, what’s the point of this document. ... You’re helping your committee understand why you should be allowed to go do this study”. When providing feedback on thinking, participants often prefer to focus on ideas rather than the document and conduct synchronous sessions on the phone or via Zoom or Skype or Teams. Whenever possible, participants accommodate students’ preferences to prevent technology from distracting from the discussion. Some participants use taxonomy models such as Bloom’s or Anderson-Krathwohl’s to help students understand levels of critical thinking. Participants also use examples to illustrate differences between levels of thinking, such as reporting versus analysing or synthesising. Participants sometimes use online group discussions to address critical thinking skills and often follow up with individual sessions. In contrast to primarily asynchronous writing instruction, participants emphasised the use of synchronous communication to promote critical thinking.

Participants also use technology to promote students’ researcher skills. Regarding data analysis software, some participants host synchronous group sessions and allow students to compare notes: “I’ll have a show-and-tell in a live group session where they talk to each other about what they’re using, but I don’t drive home a preferred choice or solution” (P6). Some participants host webinars on Delphi data analysis, and others create fake data to allow students to practise statistical analyses before collecting and analysing data for their study. Most participants reported using synchronous modalities such as phone calls or Skype or Zoom or Teams sessions when advising students on researcher skills: “A lot of times students don’t

understand what statistical tests to use, so before I share any external tools with them I talk through some of the basic logic” (P10).

Many participants use technology to recommend resources for students. Participants use course announcements, online group discussions, emails, and Word Comments to share articles, websites, videos and other resources. Some participants invite guest speakers to present to their doctoral capstone writing groups. Participants also cite page or section numbers of the APA style manual in their writing feedback. In addition, participants refer students to library resources, especially when students are working on literature reviews. When students are close to finishing their capstone, participants often recommend resources or staff in the research centre to support article publication and conference presentation. Participants also include career-related resources for individuals depending on their professional interests.

### **Social-affective dimension**

Yang and Carless (2013) described social-affective feedback as interpersonal negotiation of feedback or that which promotes dialogue, interaction and trust. Stracke and Kumar (2016) noted that social-affective feedback is given to prepare students to receive and accept cognitive feedback. Social-affective feedback also helps students begin seeing themselves as part of a larger academic discourse community (Basturkmen et al., 2014). In the current study, themes in the social-affective dimension were enhancing communication, increasing motivation and promoting self-regulation.

#### *Enhancing communication*

The first category in enhancing communication was dialogic conversations. Participants use different modes to promote dialogue, including Word Comments: “I always like to see a work in progress and then I like a conversation in the comments” (P2). P9 noted: “When I’m giving feedback on a document, even when it is a written comment, I ask them to envision it like it’s a conversation, like we’re sitting down at a coffee shop and we’re going over their document”. Participants use dialogic conversation to encourage students to take an active role in decision-making: “I tell them it’s okay to disagree with me. I’m not going to take it personally” (P5). P5 also noted that “recognising how human beings develop their emotional connection with their work ... and learning how to think critically while you’re honouring your own being ... requires communication and talking and listening, a lot of listening”.

Participants also use the online discussion forum to promote peer-to-peer engagement. P6 advises students using the Delphi design and encourages robust interaction in the discussion forum: “They are all interacting with each other within that community as they develop different sections of their proposal. And when the proposals are approved ... they’re showing the others what they’ve been doing”. P6 also noted: “I think they, as independent learners, autonomous learners, should be working with each other. I think the peer socialisation process is very powerful. They are a very tight knit group, and they cheer for each other”. P1 encourages students to post their milestone documents in the discussion forum as resources for colleagues in the group. Some participants encourage students to create their own discussion questions or discuss common APA or grammar errors. P5 uses peer interaction to help students prepare for the oral defence: “One of the things I require my students to do before they give a presentation to the committee is to present to the people in the class”.

Another communication category was overcoming challenges. Participants reported that problem-solving conversations usually take place in synchronous sessions. Some participants set aside a special time, often on the weekend, to meet with students and address their problems with the capstone. P3 noted: “If it seems like they’re struggling, then I might be a little more proactive like ‘ok, it seems like maybe there’s a breakdown here. Do we need to chat weekly? Do you need a video? What do you need?’” Participants also mentioned having phone conversations with students who were struggling with personal issues. During these conversations, participants remind students to keep moving forward.

An important communication category was trust or relationship building. P1 noted the importance of goal alignment with mentees: “Align yourself with the student ... that the student’s goals are yours. That’s where the respect and the relationship is built”. P6 reported that advising successful students in the group setting can bolster relationships with current mentees: “As far as a trusting relationship goes, I think they trust me in the sense that they see everybody’s getting done, so they know that I know what I’m doing”. P3 noted the importance of being available to mentees: “I think if they feel like they can call me anytime then they feel supported, even though they rarely do”. P3 also noted that video can be an asset: “I think videos great.

I think it's good that they can ... see your face, and I think that helps the relationship ... they can see you as a real person". P10 noted that meeting students' expectations is crucial to relationship building: "I provide very quick feedback. I give them the feedback when I say I'm going to give them the feedback. I show up when I say I'm going to show up. And I'm honest with them". P4 also noted the importance of honesty: "I will not hold back ... what I feel is an authentic response to what I'm hearing". P5 described clarifying the terms of the relationship: "I tell them 'I want you to be my colleague. Right now you're not. I'm not your friend. I am more than happy to listen ... and I do care about you as an individual'".

Participants also reported setting clear boundaries as part of the initial relationship-building process. Several participants described phone communication boundaries such as not after 10:00 p.m. or not on Sunday. P9 noted: "While I do encourage some familiarity in the classroom, I also try to make sure that it doesn't cross a line where there would not still be ... that type of respect for my role". P5 mentioned on occasion using blunt language to clarify boundaries with students.

#### *Increasing motivation*

Increasing motivation categories included celebration, humour, positive feedback, positive peer pressure and positive tone. P1 noted that celebration is often part of the process following a final oral defence. P4 said, "If somebody in the group makes an accomplishment, then I will brag about them to the group and let them tell people about it". P7 mentioned how group celebrations must be inclusive and encourage those who have not yet met milestones: "I'll try to say things like 'I can't wait to hood the rest of you as well.'"

Several participants reported using humour to motivate mentees. P5 said, "I think the most important thing in developing the collegial relationship is to have a sense of humour and to just be honest". P1 uses a funny monster emoji to flag anthropomorphism. P5 described wearing a costume during Zoom meetings at Halloween: "I'll make a fool of myself for the right reasons ... anything to get our students connected and interested". However, P7 mentioned that humour can be misinterpreted and may damage the relationship: "I've been very careful about joking or being facetious ... when I'm writing anything online ... because ... people can take those things wrong, and if I ever think there's an issue, I will follow up by phone call".

Several participants reported using positive feedback to motivate their mentees. P8 likes to praise distinguished comments in the Blackboard group discussion and include positive comments in grading feedback. After giving "tough" feedback, P7 includes a comment such as "hey, I believe that you can do it." P10 said, "I try to highlight the positive things while inserting some of the things that need to be worked on. I follow it up with encouraging feedback of some kind".

Many participants emphasised the importance of a positive tone when providing feedback. P3 avoids comments such as "awkward" or "this doesn't make sense" without providing a clear explanation. P10 said, "Sometimes we write stuff and it looks perfectly reasonable but looking at it later you're like 'oh my word.' I try to use very supportive language and provide actionable feedback". When providing feedback on a student's first draft, P9 sets a positive tone by providing general comments at the top, including "please know all of my feedback is meant to be constructive and positive and helpful to you".

#### *Promoting self-regulation*

Promoting students' self-regulation was the final theme in the social-affective dimension. P3 said, "I help them [students] understand things rather than changing things for them". P7 and P8 include selective edits and encourage students to apply the feedback to unedited portions of the manuscript. P3 recommends resources for students so they can learn how to fix things on their own and suggests strategies such as reading aloud or having a friend review the document. P10 uses balloon Comments in Word to point out issues but does not fix them for students.

Participants also promote students' self-regulation by encouraging them to envision the end. P7 said, "I talk a lot about hooding [doctoral graduation ceremony] ... so they can picture themselves doing that". P2 tells students to imagine the trajectory of their study to connect the parts: "Now let's look forward. You have written Chapter 5, and you have these findings. What do you expect to have and how would they match up with these pieces of the first three chapters?"

Several participants reported they model scholarly professionalism to promote students' self-regulation. P1 tell mentees: "I too am an active scholar and researcher, and I have to pay attention to finding leading-edge



credible validated sources ... so modelling that behaviour is the best way to establish the relationship". P3 described the importance of modelling scholarly professionalism during interactions with other committee members: "I want them [students] to see that it's ok when academics disagree ... this is how we work through it and this is how it makes the study better". P10 said, "I'm a peer reviewer ... so I share information about that with students, thinking ... these might be professional opportunities ... they might want to be involved in".

Several participants described professional empowerment as a means of promoting students' self-regulation. P1 nominates students for professional scholarships that cover expenses for professional development training. P10 uses discussion board announcements to highlight upcoming conferences and organisations mentees might be interested in. Many participants encourage their mentees to publish article adaptations of their studies in peer-reviewed journals. P5 said, "Part of the PhD process is growing a thick skin ... you have to put yourself out there".

Several participants encourage students' self-regulation by promoting life-management skills. P10 encourages mentees to use project management software to guide their work-life-capstone balance. P7 reminds mentees they need to commit at least 20 hours a week to their study, and P7 encourages mentees to establish office hours dedicated to their research.

### **Structural dimension**

Structural feedback addresses the engineering of feedback, such as timing (Carter & Kumar, 2017), sequencing, modes (i.e., how feedback is provided) and structural barriers (Yang & Carless, 2013). In the current study, structural themes were modes, preferences, procedures and barriers.

#### *Modes*

Categories in this theme included asynchronous low, asynchronous high, one-to-many, synchronous low, synchronous high and visual aid. Asynchronous low modes included Word attachments, email, Blackboard announcements and discussion posts and the special online document-sharing platform for committee members. The asynchronous low category had by far the highest number of coded items in the data set (see Tables 2 and 3). All participants use Word when providing feedback in students' capstone manuscripts. Most participants reported using Blackboard for document sharing, announcements and term plans. Blackboard is also used to promote interaction among capstone cohort members, to celebrate their achievements and to promote dissemination opportunities. Participants also use the class café in Blackboard or group email for informal discussions, especially when welcoming a new member to the group. Occasionally, participants use email when sharing Word documents, but most participants use Blackboard, per program policy.

Asynchronous high modes included embedded audio or video files in Word documents, Blackboard messages or emails. Participants rarely use this mode of communication. P5 and P10 occasionally insert audio messages in comment balloons to call attention to previous comments that may not have been read. P5 sometimes records informational videos in Zoom and Kaltura and forwards them to students via Blackboard announcements or email.

Participants also use one-to-many communication synchronously or asynchronously. The latter includes Blackboard announcements, Blackboard discussion posts and group emails. Some participants try to host synchronous group sessions via Skype or Zoom but often struggle to coordinate schedules with student cohort members living in different time zones.

Synchronous low modes included phone calls and face-to-face conversations. Most participants reported using synchronous low technology when communicating with mentees. P5 said 80% of her students do a biweekly phone conference. P8 mentioned: "Sometimes we have phone calls to go over the feedback ... if it is not clear to them or they want to understand how to do it". P3 noted that when students are struggling, a phone conversation is often the best strategy, especially to discuss "bigger ideas and concepts". P7 also uses phone communication with mentees: "I can tell when we've kind of hit that point where we need to do voice-to-voice".

Synchronous high modes included VoIP meetings via Zoom, Skype, Teams or GoToMeeting. P6 described how VoIP sessions can facilitate reception of feedback: “I don’t like to drop a document back with 60 comments. I like to walk them through it”. Screen sharing was described as helpful to some participants when teaching data analysis. P5 conducts regular Zoom meetings with students at all stages, including near the end when students are sharing raw data. P2 mentioned that Zoom sessions are crucial at the prospectus stage to ensure studies are properly designed and launched. P2 also mentioned that the camera is usually turned off when screen sharing to focus on the document. Several participants mentioned that most students are comfortable with one-on-one VoIP sessions, but students seem less likely to attend or participate in group VoIP sessions.

#### *Preferences*

Categories in this theme included equipment, member tech preference, perception of technology use and student preference. P3 prefers two large monitors when comparing drafts, P4 uses a Bluetooth device to enhance audio for hearing aids, and P8 uses a conventional clock that provides external pressure for meeting feedback deadlines. When discussing concepts or processes with students, P1 prefers not to screen-share because focusing on the document can be distracting. Some participants prefer feedback tools such as macros and TypeItIn, but others do not. Most participants prefer Zoom when conducting VoIP meetings with students.

Most participants reported that they accommodate students’ preferences to facilitate communication. P1 said, “I choose whatever is the lowest threshold to facilitate the work we need to do”. P8 said “we [students] talk on the phone ... depending on what their preference is”. P2 said the frequency and platform for the meeting “depends on what’s best for that student”. P3 mentioned adjusting the frequency of synchronous meetings based on students’ preferences and productivity: “Some students are ‘hey I’m good, we don’t need to talk that often, I’m just working away’ and we just give feedback via the document”.

#### *Procedures*

Categories in this theme included committee procedures, document management, faculty workload management, focus on task, timing and tracking student progress. When functioning as second committee member, P5 mentioned respecting the role of the chair by copying the chair in any communication with the student. Participants use email and the special online document-sharing platform for communicating with committee members. P4 and P10 reported helping the student incorporate feedback from other committee members without getting discouraged.

Regarding document management, participants use several technology tools including the BlackBoard classroom, email, and special online document-sharing platform for capstone writers. Most participants create folders on their computers to manage the flow of documents from students and committee members. P2 and P3 use an Excel spreadsheet to track students’ work. Several participants use paper calendars and notebooks to organise the workflow. Other participants use electronic calendars to organise meetings and due dates. Several participants use a naming system with dates to organise drafts as they come in. P2, P4, P6 and P9 use Compare Documents in Word to avoid duplicating their feedback and to ensure students are incorporating their feedback. Several participants use email to keep students on track, and all participants use the term plan to help students stay focused on their quarterly goals.

#### *Barriers*

Categories in this theme included organisation or program limitations, tech hinders and timing barriers. P10 explained that the special online document-sharing platform can sometimes cause confusion and delays regarding feedback provided. Other participants described timing barriers, especially with students living in different time zones. Some participants said they avoid synchronous group meetings because it is too difficult to coordinate students’ schedules and some students are not comfortable in live group sessions.

The most prominent barrier was technology. P1 said, “Technology is not always as reliable and as facile and user-friendly as we might want it to be”. P7 made a similar point that students “tend to freak out about the technology and we lose the content of what we’re doing”. P5 said, “Technology can be a blessing and a curse” because students do not always check their emails. Several participants reported that they work around technology barriers by keeping it simple and accommodating students’ preferences.

## Co-occurrence of dimension and mode

In the cognitive dimension, most mentions of ensuring accountability and providing instruction were in the asynchronous low mode, as shown in Table 2.

Table 2  
*Co-occurrence of cognitive dimension and mode*

Theme	Asynchronous low	Asynchronous high	Synchronous low	Synchronous high
Accountability	53	2	14	11
Instruction	78	1	16	36

A notable finding was screen sharing was used to address writing and APA issues, to clarify feedback comments and to teach qualitative coding or statistical analysis techniques. However, screen sharing was generally not preferred when discussing ideas or concepts. In the social-affective dimension, most mentions of enhancing communication, increasing motivation and promoting self-regulation were also in the asynchronous low mode, as shown in Table 3.

Table 3  
*Co-occurrence of social-affective dimension and mode*

Theme	Asynchronous low	Asynchronous high	Synchronous low	Synchronous high
Communication	91	1	33	39
Motivation	30	4	1	5
Self-regulation	61	0	16	13

## Discussion

Feedback is the primary means through which doctoral students are socialised to learn the expectations and discourse practices of academic communities (Gray & Crosta, 2018; V. Kumar & Stracke, 2007; Stracke & Kumar, 2016). Most participants in the current study reported using asynchronous low technology via Word's Track Changes and Comments as their primary feedback mode, which aligned with Basturkmen et al.'s (2014) findings regarding text-based feedback. Holser and Arend (2012) noted that direct, supportive, timely and detailed feedback enhances students' critical thinking, which was confirmed by the current findings. Thurlings et al. (2014) found that neutral, detailed, and goal-directed feedback was more effective than general, non-goal-directed and too positive or negative feedback, which was also consistent with the current findings.

A positive, supportive relationship with the chair is an important influence on doctoral students' motivation to complete their capstone study (Fiore et al., 2019; Jameson & Torres, 2019). Current participants use honesty, empathy and accommodation of students' technology preferences to nurture a trusting relationship. Lim et al. (2019) noted that online doctoral students can increase the likelihood of completing their study by learning and using technology that supports the capstone process, which was confirmed in the current study. Sekulich (2020) argued that online faculty need to take an active approach in instructing and supporting online students, but students must accept responsibility for their skill development. Current participants promote students' self-regulation by providing detailed feedback, encouraging students to envision the end and modelling scholarly professionalism.

Odo and Yi (2014) found that learning to negotiate empowers graduate students to become collaborators in the feedback process, which was consistent with current findings. Participants reported using dialogic feedback practices, often via Comments in Word, to encourage students to take an active role in negotiating meaning. Other researchers encouraged collaborative dialogue between faculty advisors and students (Adams, 2018; Maor & Currie, 2017; Persson et al., 2018). Current participants accommodate students' technology preferences to reduce the transactional distance and promote a community of research. Many participants describe their feedback practices to students early in the capstone advising process to prevent misunderstandings from impeding learning (see Dermol & Trunk Sirca, 2018; Gredler, 2018; L. Xu, 2016; Yuan & Kim, 2015). Although audio feedback had been shown to help students understand written feedback (Yang & Carless, 2013), most current participants do not use this type of asynchronous high technology.

Findings also indicated that participants generally accommodate students' lack of interest in synchronous group meetings to avoid scheduling and time zone challenges. Participants reported that group discussions tend to occur asynchronously in the Blackboard platform and via email. Martin et al. (2020) found that the learning management system was the highest-ranked factor in importance and competence among postsecondary faculty in online, hybrid and face-to-face environments. Participants in the current study use Blackboard to post announcements, encourage peer interaction and provide feedback in students' manuscripts. Participants did not report the use of social media in doctoral capstone advising, which may reflect either participants' or students' (or both) lack of interest in social media for doctoral capstone advising, or institutional barriers that require interactions to occur within Blackboard.

## **Conclusion**

Supervision is one of the most important elements in successful doctoral outcomes (Alexander & Davis, 2019). The need for responsive and personalised feedback is particularly important for doctoral students who may never meet their committee members face-to-face. We discovered that research on feedback practices in doctoral advising was limited (see S. Kumar & Coe; 2017; S. Kumar & Johnson, 2019; S. Kumar et al., 2019; Yu & Lee, 2013). Researchers had examined what doctoral students learn, but not how they learn (Adams, 2018) or the role technology plays in the capstone feedback process. Although the current findings were limited by the small, self-selected sample of fully online faculty serving on capstone committees at a private online university, findings may be transferable to faculty serving on capstone committees in other online or traditional programs.

The current findings may be used to improve communication between faculty and students and enhance alignment between faculty's practices and students' preferences in the doctoral capstone writing process (see Gredler, 2018). In the lingering context of the COVID-19 pandemic (see Mullen, 2020; Stevens et al., 2021) in which faculty and students from traditional universities have been required to communicate virtually rather than face-to-face, the findings may be used to promote better communication and to improve feedback practices in those settings as well. The findings may also be used to help faculty and students negotiate the purpose of doctoral research as both a knowledge-production and career-development activity (see Skov, 2021). Additionally, the findings related to how online faculty use technology in the social-affective dimension may be helpful in working with pandemic-stressed, online doctoral students. Future research could examine faculty's use of asynchronous and synchronous technology for feedback in hybrid or traditional settings, explore technology use from students' perspective or examine the predictive relationships between faculty's use of asynchronous and synchronous technology and students' outcomes or satisfaction in doctoral programs.

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