Technologies, Strategies, and Supports Helpful to Faculty in the E-mentoring of Doctoral Dissertations

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Abstract
Prior research has established the importance of the supervisor-doctoral candidate relationship and highlighted the importance of mentoring practices for the successful completion of doctoral theses/dissertations in the online environment. This article presents the findings of a survey with faculty members who work as supervisors in online and blended doctoral programs, and e-mentor students working on dissertations, or did so at a distance as a result of COVID-19. The survey was designed around the five sections of technology use in e-mentoring, strategies related to communications and expectations, strategies related to research processes, strategies related to emotional and social support for students, and institutional support, with a focus on which technologies and strategies faculty found most helpful. The results of the e-mentoring survey are presented and discussed in the context of prior literature and future research.

Keywords: E-mentoring, online supervision, online mentoring, virtual mentoring, faculty strategies

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Online and blended doctoral education has seen steady growth in the last two decades, driven by the spread of online education (Seaman et al., 2018) and the increasing need for terminal degrees in non-academic workplace environments. Doctoral programs are offered completely online or in a blended format (including face-to-face experiences), often enroll cohorts of students, and encompass different dissertation formats (Kumar & Dawson, 2018). Online dissertation supervision or the e-mentoring of students working on dissertations is thus increasingly being practiced and saw universal application during the COVID-19 pandemic when institutions of higher education pivoted to emergency remote or online teaching (Hodges et al., 2020; Kumar & Wisker, 2021). During the continuing COVID-19 pandemic, e-mentoring has, in many ways, eclipsed the traditional relationship held between faculty and graduate students. It has also proven beneficial for many graduate students by improving access to further learning and making graduate studies more manageable for working learners (Jameson & Torres, 2019).

Prior research has established the importance of the supervisor-doctoral candidate relationship and the practices of dissertation chairs to doctoral candidate progress and completion of doctoral theses/dissertations in the online environment (Kumar & Johnson, 2017). Individual studies have highlighted challenges and strategies that work in the e-mentoring of dissertations, as have recent literature reviews (Pollard & Kumar, 2021). This research endeavors to identify the technologies, strategies, and institutional support that faculty have found most helpful in their e-mentoring of doctoral dissertations. Knowledge of strategies that have been most helpful can be valuable to new faculty members embarking on doctoral e-mentoring in online and blended doctoral programs or those adopting e-mentoring due to the ongoing COVID-19 pandemic. The results about helpful institutional support can also better enable institutions to provide resources for faculty as they work remotely or in online and blended doctoral programs.

Literature Review

Although dissertation e-mentoring has been practiced for a while in online and blended doctoral programs, the 2020-21 global COVID19 pandemic brought the imperative for identifying helpful strategies for e-mentoring into much clearer focus. This review of prior research on the e-mentoring of dissertations is organized according to the technology use for dissertation e-mentoring, communication and expectations, e-mentoring and the research process, psychosocial support, and institutional support.

Technology Use for Dissertation e-Mentoring

Obviously, the ability to successfully utilize the technological tools and applications that make e-mentoring possible is a necessity. E-mentors and online doctoral students in prior research have emphasized the importance of "choosing and using appropriate technologies" and using "both synchronous and asynchronous online technologies for different purposes" during the dissertation process (Kumar & Coe, 2017, p. 132). Both doctoral students and mentors in the literature have valued online video conferencing technologies over the years that simulate face-to-face conversations and enable them to communicate with their mentors in real-time, such as Skype, Adobe Connect, Elluminate, Big Blue Button, Google Hangouts, Wimba, and Zoom (Andrew, 2012; Guerin & Aitchison, 2021; Kumar et al, 2013; Kumar et al., 2018; Roumell & Bolliger, 2017; Torka, 2021). Although phone calls have been mentioned in this literature as convenient, especially when technical issues occur, online video conferencing technologies have become increasingly common for one-on-one or group meetings, presentations, feedback and

clarification, screensharing, data analysis, and dissertation or proposal meetings. The usefulness of email for asynchronous communication, exchanging drafts, and feedback on those drafts, with track changes or comments in MS Word have also been detailed in the literature (Guerin & Aitchison, 2021; Gumbo, 2019; Kumar & Coe, 2017; Kumar et al., 2018; Roumell & Bolliger, 2017). Although Learning Management Systems (LMSs) have been traditionally used, more recently, students and faculty have utilized technologies such as MS Teams or Slack, and WhatsApp or other social media that integrate several asynchronous, synchronous, and collaborative features (Byrnes et al., 2019; Crosta et al., 2018; Guerin & Aitchison, 2021; Gumbo, 2019; Torka, 2021).

The use of online research databases and bibliographic software, as well as qualitative and quantitative research analysis tools are essential during research processes in dissertations. E-mentors' familiarity with these technologies and their ability to apply and, on occasion, teach them to doctoral students can greatly facilitate research skill development and research implementation (Kumar & Dawson, 2018; Kumar et al., 2020). Researchers have highlighted the value of software for collaborative resource sharing, storage, editing, and the development of research ideas and writing between e-mentors, doctoral students, and research groups in the online environment (Guerin & Aitchison, 2021; Kumar et al., 2018; Kumar et al., 2021). Notwithstanding the various technologies used in e-mentoring, technological anxiety, and unfamiliarity with the online environment can influence e-mentors' abilities to supervise in the online environment, as well as doctoral student satisfaction and success during dissertations completed at a distance (Bolliger & Halupa, 2012; Kumar & Dawson, 2018; Nasiri & Mafakheri, 2015). Distance and blended doctoral programs should therefore include generous amounts of support and tutorials for the use of technology as an essential component of the program to address limited familiarity with applications and tools (Erichsen et al., 2013). Such opportunities must be provided for both faculty and students to improve their digital capabilities in the doctoral learning environment (Zhang et al., 2020).

Communication and Expectations

A recurring theme in Pollard and Kumar's (2021) review of empirical studies in reference to e-mentoring doctoral students was the potential for miscommunication. Their review found that within the virtual e-mentoring relationship, information exchanged may be reduced or confused during online interactions, suffer the loss of non-verbal cues, get lost in the one-way-at-a-time nature of asynchronous communication, and lose clarity due to unknown cultural differences, ultimately leading to misunderstandings. These challenges with miscommunication increase the importance of making sure expectations are clearly articulated and communicated to mentees. Frequent communication and feedback remain the primary forms of support faculty can offer students in the e-mentoring relationship (Kumar & Coe, 2017), and are crucial in establishing trust and positive relationships, encouraging engagement, and offering the requisite guidance and support needed for success.

The foundation of all recommendations for the online environment is frequent and effective communication that build a sense of connection and a relationship between faculty mentor and doctoral mentee, especially because mentees might hesitate to initiate contact or communicate online (Black, 2017; Erichsen et al., 2014; Rademaker et al., 2016). Such communication, be it asynchronous or synchronous, has to be initiated by the e-mentor, and synchronous communications have to be scheduled and structured purposefully by the e-mentor, e.g., in the form of virtual office hours or regularly scheduled meetings (Kumar & Coe, 2017;

Kumar & Johnson, 2019; Nasiri & Mafakheri, 2015). E-mentor availability and flexibility for communications and meetings is also extremely important for doctoral student progress (Byrnes et al., 2019; Kumar et al., 2018). The frequency of meetings can also differ based on the mentee's dissertation stage (Jacobs et al., 2015). Timely, clear, and constructive feedback on writing and drafts are crucial for student progress and success (Byrnes et al., 2019; Erichsen et al., 2014; Kumar & Coe, 2017).

Given the absence of prior e-mentoring experiences and possibility for misunderstanding in the online environment, e-mentors should also make their expectations explicit verbally or in written form when embarking on the e-mentoring of dissertations (Andrew, 2012; Jacobs et al., 2015; Roumell & Bolliger, 2017). These expectations and initial discussions can relate to the e-mentoring process; the roles and responsibilities of the e-mentor and mentee; synchronous and asynchronous communications; modes, netiquette, and a strategy for communication; the availability of the mentor, deadlines and timelines; the types of technologies to be used during the e-mentoring process; and might need to recur and be renegotiated during various parts of the research process (Crawford et al., 2014; Kumar et al., 2018; Kumar & Johnson, 2019; Kumar et al., 2020; Pollard & Kumar, 2021). The discussion of goals and expectations of the e-mentor and mentee is crucial for all e-mentoring relationships, but especially when social and cultural differences are experienced (Berg, 2016; Deshpande, 2017; Nasiri & Mafakheri, 2015).

E-mentoring and Research Processes

The building of e-mentoring relationships has been found to hinge on making expectations explicit and providing clear guidance and structure for the dissertating process (Kumar & Johnson, 2019; Norcross et al., 2020). Faculty members in Kumar and Johnson's (2019) study and students in Kumar and Coe's (2017) study discussed the importance of structure in the online environment—not only to reduce isolation, keep students connected, and ensure productive interactions, but also in the form of research education. In the absence of research apprenticeships or the modeling and emulation of research processes and behaviors in an on-campus environment, structured guidance for research skill development and research implementation is crucial during e-mentoring processes (Kumar & Johnson, 2019; Kumar et al., 2018). Templates, structured writing aids, and exemplars of dissertations or other forms of scholarship can be very helpful to online doctoral students (Kumar & Johnson, 2019; Kumar et al., 2020). E-mentors should also be able to not only share relevant online resources, but also connect their mentees with experts who can help them with their research or provide research interactions in their geographical area (Kumar et al., 2020).

At the same time, students might need different types of structure or support at different points in their writing or research process, therefore resources as well as guidance regarding the dissertation process, research designs, ethical reviews, data analysis (e.g., use of research software), and writing can contribute to their success (Jameson & Torres, 2019; Kumar et al., 2018). Guerin and Aitchison (2021, p. 626) also emphasize "the need for explicit instruction to develop research writing skills" in the online environment. In addition to timely and constructive feedback, several researchers have also highlighted the usefulness of peer reviews and peer critiques of writing among candidates in the online environment (Byrnes et al., 2019; Guerin & Aitchison, 2021; Kumar & Coe, 2017; Nasiri & Mafakheri, 2015). Finally, opportunities to engage in collaborative research, publications, and presentations with their e-mentors can contribute to online doctoral student success (Roumell & Bolliger, 2017).

Psychosocial Support

In this paper, we employ the term *e-mentoring* as encompassing "the various roles played by faculty with respect to the academic, professional, psychosocial, and cognitive development of students" (Kumar & Johnson, 2019, p. 270). While the dissertation process can be a difficult and lonely endeavor even in on-campus programs, psychosocial support is especially important for doctoral students in the online environment where the absence of academic interactions, community, and embeddedness in a research-rich environment cause feelings of disconnect and isolation (Andrew, 2012; Erichsen et al., 2014; Pollard & Kumar, 2021; Roumell & Bolliger, 2017). Mentor responsiveness and feedback, the cultivation of trust, the expression of care and concern for the mentee, discussion of well-being, and awareness and consideration of cultural, social, and individual differences can be helpful to mentees (Berg, 2016; Deshpande, 2017; Jacobs et al., 2015; Kumar & Coe, 2017; Yob & Crawford, 2012). Interpersonal relationships between e-mentors and their mentees have assumed even more importance for mentee well-being and progress during the COVID-19 pandemic (Bendrups et al., 2021).

E-mentors' facilitation of relationships between mentees and connections with institutional resources have also been reported as beneficial to mitigate feelings of isolation and contribute to dissertation progress in the literature (Kumar et al., 2018; Kumar et al., 2021). Outcomes of peer e-mentoring, as reported by Norcross et al. (2020), comprised reports of improved levels of satisfaction, mutual assistance and collaboration, a greater sense of social support, reduced perceptions of stress, higher levels of perceived self-efficacy, and personal career growth resulting from interacting and co-peer-mentoring (Jacobs et al., 2015).

Institutional Support

Institutions must establish the necessary mechanisms and structures to ensure that all online or remote doctoral students, regardless of their location or part/full-time status, have access to the needed technologies and resources for research and their scholarly development (Roumell & Bolliger, 2017). The provision of these resources by institutions is helpful to faculty who e-mentor dissertations. Information literacy instruction and off-campus access to research databases as well as librarians are fundamental for doctoral student success (Kumar & Dawson, 2018). In addition to these resources, online or remote doctoral students need institutional support in the form of online tutorials and support for research-related processes (e.g., Institutional Review Board processes) and technologies used during research (e.g., SPSS) (Kumar & Coe, 2017; Kumar et al., 2018).

While institutional support is particularly important for student success, it is also important for faculty who e-mentor doctoral students (Deshpande, 2017; Kumar & Johnson, 2019; Roumell & Bolliger, 2017). Research has demonstrated that faculty positively respond to professional development opportunities related to the effective e-mentoring of remote doctoral students (Jameson & Torres, 2019; Steinert et al., 2016). Institutional acknowledgement of and support for the development of effective online pedagogies and practices are also important in cultivating an environment that systematically supports remote and hybrid student success (Roumell & Bolliger, 2017).

Research Purpose and Questions

The purpose of this study was to explore the technologies, strategies, and institutional resources that faculty who e-mentor doctoral students find helpful during the dissertation process. E-mentoring in our research refers to online, virtual, or distance supervision, advising, or mentoring in doctoral programs but focuses primarily on the dissertation stage. The following research questions informed this study:

1. What technologies do faculty who e-mentor doctoral students use during the dissertation process?

2. What strategies do faculty who e-mentor doctoral students find helpful during the dissertation process?

3. How helpful are institutional resources that are available to faculty who e-mentor doctoral students during the dissertation process?

Methodology

A survey-based approach was used to study the research questions. This section details the survey instrument, participants, and the procedures used for data collection and analysis.

Instrument

Based on the literature review, a previous survey (Roumell & Bolliger, 2017) and an e-mentoring framework resulting from prior research (Kumar et al., 2018), we created a survey about e-mentoring strategies in four sections (communications, research process, student support, and institutional support). We also included demographic questions and a fifth section on technology use. The survey underwent review by a panel of six experts from four different institutions who provided feedback on content validity, construct validity, and face validity. These faculty members were considered experts because they had several years of experience mentoring doctoral students online and/or had conducted research on doctoral student supervision. Their feedback resulted in the addition and deletion of items, and some minor edits. The final survey comprised of five sections: Technologies, Communication and Expectations, Research Process, Student Support, and Institutional Support. Faculty use or non-use of technologies was surveyed and a five-point Likert scale (1 = *Not Very Helpful*, 2 = *Not Helpful*, 3 = *Neutral*, 4 = *Helpful*, 5 = *Very Helpful*) was used for the other four sections. The definition of e-mentoring was provided in the survey introduction and participants were asked how helpful they found these technologies, strategies, or types of support when e-mentoring students through the dissertation process. After the data collection, a reliability analysis was performed on the questionnaire. The internal reliability coefficient was sufficient ($\alpha = .78$). Additionally, the survey included items for demographic information (e.g., gender, discipline, faculty rank).

Data Collection and Analysis

Convenience sampling was used for this study. In the last week of April 2021, faculty members who supervise doctoral students in the dissertation phase online were invited to complete an online questionnaire housed in Qualtrics after permissions from all relevant Institutional Review Boards were obtained. The invitation was distributed via email and listservs at two large public universities where two of the authors worked at the time and which offered online and blended doctoral programs. To reach and survey faculty who supervise dissertations

online, the survey was also sent through professional organizations of which the authors are members (the Association of Educational Communications and Technology, the Online Teaching and Learning SIG of the American Educational Research Association, the Carnegie Project on the Education Doctorate, the Commission of Professors of Adult Education), and through social media. The invitation included a description of the study, definitions, and an embedded link to the survey site. The participants gave informed consent before completing the survey. Participation was voluntary and anonymous, and no incentives were offered to individuals who participated in the study. The survey was open for four weeks.

Twenty-seven individuals accessed the online survey without entering responses. A total of 65 individuals completed the survey between end-April and May 2021. Two cases were deleted because one case had more than one-third of the data missing, and one individual did not meet all selection requirements. Replacing missing data with the series means was not necessary because none of the remaining 63 cases had missing data. Descriptive statistics and frequencies were generated.

Participants

The majority of participants was female (69.8%), and diverse faculty ranks and four disciplines were represented in the sample (see Table 1). Faculty members' doctoral student mentoring experience ranged from 1 to 25 years (M = 6.82; SD = 5.44). Most participating mentors worked in the United States (93.7%); however, one respondent each was from Canada, Pakistan, and the Netherlands. The number of doctoral advisees who were at the dissertation/thesis phase that participants were advising at the time of the survey ranged from 0 to 75 (M = 7.48; SD = 11.52). Most respondents supervised between 0 to 23 doctoral students; only one person advised 45 and another supported 75 students.

Most doctoral programs in which participants worked were delivered either online (48.3%) or in a blended format (25.0%). Five percent of respondents had both online and on-campus doctoral programs, and 1.7% indicated their programs were delivered online, blended, and on-campus. Twenty percent had on-campus doctoral programs but had shifted to online or remote delivery due to COVID-19. Of those who taught in primarily online programs, 50.9% had required on-campus sessions. Most programs utilized a cohort-based model (59.0%), whereas 31.1% did not have cohorts. Some individuals were unsure about cohorts (9.8%).

When asked about the culminating product doctoral students had to deliver in their programs, 85.0% of participants indicated students completed a traditional 5-chapter dissertation. Other products included a 3-chapter dissertation (1.7%), 6 to 10-chapter dissertation with 4 to 6 published studies (1.7%), dissertation in practice (1.7%), and capstone project (1.7%). In some programs students had options regarding the dissertation format: a 5-chapter dissertation or three published studies/papers (6.7%) or a 5-chapter dissertation or two articles (1.7%).

Table 1
Demographics of Participants

Demographics	***n***	**%**
Gender		
Female	44	71.0
Male	16	25.8
Transition or fluid	1	1.6
Not disclosed	1	1.6
Faculty rank		
Assistant professor	7	11.3
Clinical assistant professor	5	8.1
Associate professor	20	32.3
Clinical associate professor	3	4.8
Full professor	14	22.6
Clinical full professor	1	1.6
Instructor/lecturer	3	4.8
Senior lecturer	1	1.6
Adjunct faculty	8	12.9
Discipline		
Education	52	83.9
Health sciences	6	9.7
Humanities & social sciences	2	3.2
Psychology	2	3.2

Results

The results of the survey are presented here according to the research questions.

Research Question 1: Technologies

Participants were asked to select technologies they used to e-mentor doctoral students during the dissertation/thesis process from a provided list of tools. The five most often used resources in the mentoring process were: email (98.4%), videoconferencing (95.2%), Word processing software (84.1%), phones (73.0%), and collaborative documents (61.9%). In contrast, social media was used by the fewest respondents (Table 2).

Table 2
Technologies Utilized by Doctoral Mentors

Tools	Use	
	n	*%*
email	62	98.4
Videoconferencing (e.g., Zoom, WebEx, Skype)	60	95.2
Word processing software (e.g., Word)	53	84.1
Phones	46	73.0
Collaborative documents (e.g., Google Docs, Office 365	39	61.9
Shared storage (e.g., Dropbox, Google Drive)	34	54.0
Learning management systems (e.g., Moodle, Canvas)	30	47.6
Qualitative research software (e.g., Nvivo, Atlas)	21	33.3
Quantitative research software (e.g., SPSS)	19	30.2
Instant messaging	17	27.0
Bibliographic software (e.g., RefWorks, Mendeley)	13	20.6
Social media	6	9.5

Additional technology resources respondents provided in a write-in option included Google Scholar (a search engine for scholarly literature), Grammarly (a writing-assist program), OneNote (a note-taking program), Reciteworks (a reference check program), Slack (a communication platform), TextNow (a phone calling and texting application), and a platform for dissertation services. The number of provided resources that were used ranged from three to 11 (M = 6.35; SD = 1.89) indicating that mentors use a variety of resources in the e-mentoring process.

Research Question 2: Strategies

Communication and expectations. In this category 12 of the 13 strategies had a mean score above 4.00 (Table 3). The three items with the highest means scores and which were also either *helpful* or *very helpful* for over 90% of participating mentors addressed giving constructive feedback to students (M = 4.90; SD = 0.35), speaking to students about the mentor's expectations (M = 4.83; SD = 0.49), and meeting regularly synchronously with mentees (M = 4.81; SD = 0.54). Over 90% of participants also reported that asynchronous communication, adequate response times, and collaborative goal setting are helpful or very helpful strategies. Item 7, *Complete a formal mentoring contract or mentoring agreement*, was not applicable to 46% of respondents; this item had the lowest mean (M = 3.12; SD = 1.09).

Table 3

Frequencies and Descriptives for Communication and Expectations Items (*N* = 63)

Item	*NVH/NH*	*N*	*H/VH*	*N/A*	*M*	*SD*
		%				
1. Meet regularly (e.g., bi-weekly, or monthly) with mentees in real time (e.g., phone, videoconference)	1.6	1.6	96.8	0	4.81	0.54
2. Communicate asynchronously with mentees regularly (e.g., email)	0	4.8	95.2	0	4.67	0.57
3. Specify your availability and nonavailability to mentees	9.5	7.9	79.4	3.2	4.38	1.05
4. Discuss use of available technologies with mentees	1.6	19.0	73.0	6.3	4.29	0.85
5. Make online communication strategies explicit to mentees (e.g. frequency, initiating contact)	3.2	7.9	87.3	1.6	4.52	0.78
6. Discuss your expectations with mentees	0	4.8	95.2	0	4.83	0.49
7. Complete a formal mentoring contract or mentoring agreement	14.3	19.0	20.7	46.0	3.12	1.09
8. Respond to mentees in a timely manner (e.g., within 48 hours)	0	1.6	93.6	4.8	4.73	0.48
9. Outline milestones for mentees	3.2	3.2	87.3	6.3	4.61	0.72
10. Collaboratively decide on a timeline for mentee milestones	1.6	1.6	90.5	6.3	4.64	0.61
11. Specify time frame for feedback on student work	4.8	7.9	84.1	3.2	4.43	0.85
12. Provide constructive feedback	0	1.6	93.6	4.8	4.90	0.35
13. Discuss students' responsibilities	1.6	6.3	88.9	3.2	4.61	0.69

Note. Scale ranging from 1 = *not very helpful* to 5 = *very helpful. NVH* = not very helpful, *NH* = not helpful, *N* = Neutral, *H* = Helpful, *VH* = Very Helpful, *N/A* = Not applicable.

Research processes. All items in this category except for item 19 were considered either *very helpful* or *helpful* by the majority of participants as evident by mean scores above 4.00 (Table 4). These items included providing resources and an overview of the dissertation process, assisting students with the institutional review board review and data analysis, conducting collaborative research, and connecting students with other knowledgeable students or experts. Encouraging students to utilize a peer review process had the lowest mean (*M* = 3.60; *SD* = 1.05) and was not applicable to 9.5% of respondents.

Table 4
Frequencies and Descriptives for Research Process Items (*N* = 63)

Item	*NVH/NH*	*N*	*H/VH*	*N/A*	*M*	*SD*
		%				
14. Provide resources (e.g., example dissertations/thesis)	0	4.8	95.3	0	4.60	0.58
15. Provide an overview of all steps early in the process	3.2	4.8	90.5	1.6	4.52	0.74
16. Assist mentees with the IRB (institutional review board) or ethics review process	1.6	11.1	84.1	3.2	4.36	0.75
17. Assist mentees with data analysis	1.6	11.1	80.9	6.3	4.22	0.72
18. Connect mentees with peers or experts with research-related expertise	3.2	20.6	68.3	7.9	4.12	0.88
19. Encourage peer review of mentee work	14.3	22.2	54.0	9.5	3.60	1.05
20. Engage in collaborative research (e.g., publications, presentations)	4.8	14.3	68.2	12.7	4.13	0.94

Note. Scale ranging from 1 = *not very helpful* to 5 = *very helpful. NVH* = not very helpful, *NH* = not helpful, *N* = Neutral, *H* = Helpful, *VH* = Very Helpful, *N/A* = Not applicable.

Student support. Of the nine items in this category, five strategies had a mean score above 4.00 (Table 5). These items pertained to adapting mentoring strategies based on individuals (*M* = 4.56; *SD* = 0.67), providing emotional and social support (*M* = 4.40; *SD* = 0.87), making institutional resources available (*M* = 4.33; *SD* = 0.70), talking about time management (*M* = 4.13; *SD* = 0.89), and helping students to develop an online community (*M* = 4.07; *SD* = 1.00). Group mentoring was considered the least helpful strategy (*M* = 3.42; *SD* = 1.08) in the student support category, although this item did not apply to 12.7% of participating faculty mentors.

Table 5
Frequencies and Descriptives for Student Support Items (*N* = 63)

Item	*NVH/NH*	*N*	*H/VH*	*N/A*	*M*	*SD*
		%				
21. Provide psychosocial support (e.g., emotional support, social support)	4.8	6.3	88.8	0	4.40	0.87
22. Discuss mentees' time management (e.g., strategies, challenges)	6.4	9.5	84.1	0	4.13	0.89
23. Discuss work-life balance	6.4	9.5	84.1	1.6	3.98	0.93
24. Provide opportunities for mentees to form relationships with peers	6.4	14.3	73.0	6.3	4.07	1.00
25. Connect mentees with institutional resources	0	12.7	87.3	0	4.33	0.70
26. Discuss the mentoring experience with the mentee	4.8	30.2	61.9	3.2	3.90	0.96
27. Mentor students in groups	17.5	23.8	46.0	12.7	3.42	1.08
28. Adapt mentoring strategies based on mentee	1.6	4.8	92.1	1.6	4.56	0.67
29. Provide career guidance	6.4	19.0	61.9	12.7	3.91	0.95

Note. Scale ranging from 1 = *not very helpful* to 5 = *very helpful. NVH* = not very helpful, *NH* = not helpful, *N* = Neutral, *H* = Helpful, *VH* = Very Helpful, *N/A* = Not applicable.

Research Question 3: Institutional Support

The two institutional support resources that were considered most helpful by participants included statistical software for online or remote students (*M* = 4.30; *SD* = 0.82) and incentives provided by institutions for faculty who mentored doctoral students (*M* = 4.20; *SD* = 1.08) (Table 6). Items with a mean score at or above 4.00 included a dedicated librarian for online learners, and information literacy instruction and resources for students. Professional development for faculty who supervise doctoral student research was the least helpful resource (*M* = 3.35; *SD* = 1.36). Interestingly, neither incentives nor professional development were applicable for a large percentage of respondents, 44.4% and 41.3% respectively.

Table 6

Frequencies and Descriptives for Institutional Support Items (*N* = 63)

Item	*NVH/NH*	*N*	*H/VH*	*N/A*	*M*	*SD*
		%				
30. Just-in-time information literacy resources (e.g., tutorials, LibGuides) for online/remote doctoral students	4.8	22.2	63.4	9.6	4.00	0.91
31. Information literacy instruction (e.g., searching databases) for online/remote doctoral students	6.3	17.5	66.6	9.5	4.02	0.92
32. Dedicated librarian for online/remote students (e.g., e-librarian, embedded librarian)	4.8	19.0	63.5	12.7	4.09	0.99
33. Online support for IRB processes (e.g., tutorials)	9.5	23.8	54.0	12.7	3.85	1.03
34. Online support for formatting dissertations/theses (e.g., dissertation office support)	12.7	14.3	58.8	14.3	3.83	1.13
35. Statistical software programs for online/remote students (e.g., NVivo, SPSS)	4.8	4.8	76.2	14.3	4.30	0.82
36. Incentives for faculty e-mentoring of dissertations/theses (e.g., course release)	4.8	7.9	42.9	44.4	4.20	1.08
37. Professional development for e-mentoring of student research	17.4	12.7	28.6	41.3	3.35	1.36

Note. Scale ranging from 1 = *not very helpful* to 5 = *very helpful. NVH* = not very helpful, *NH* = not helpful, *N* = Neutral, *H* = Helpful, *VH* = Very Helpful, *N/A* = Not applicable.

Table 7 shows the statistics for all subscales of the questionnaire. The communication and expectations subscale had the highest mean score, whereas the institutional support subscale had the lowest mean. The standard deviations are relatively minor with the exception of the institutional support subscale.

Table 7

Summary Statistics

Subscale	No. of items	*M*	*SD*	Variance
Communication and expectations	13	4.25	0.57	0.329
Research process	7	3.98	0.64	0.410
Student support	9	3.92	0.60	0.355
Institutional support	8	3.18	1.09	1.182

Note: Scale ranging from 1 = *not very helpful* to 5 = *very helpful*.

Limitations

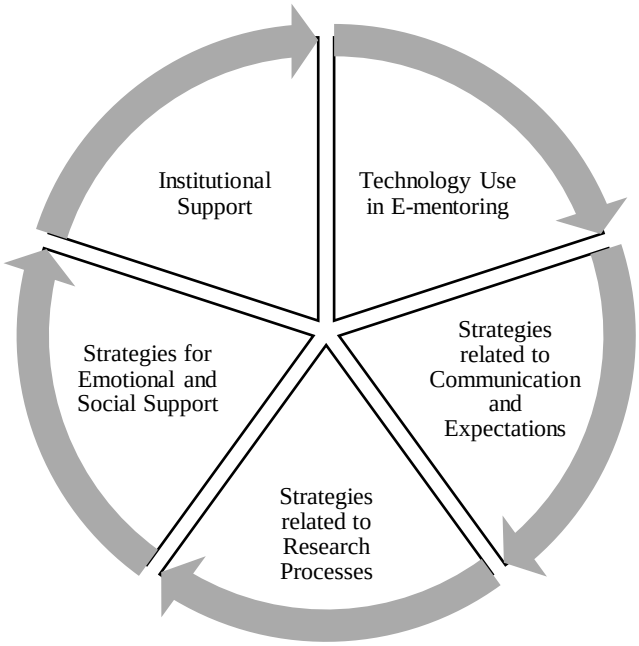
This study had several limitations. The sample size was small; 94% of participants worked in the United States, and 84% identified their discipline as education. The survey was disseminated between April and May 2021, during the ongoing COVID-19 pandemic, which impacted the response rate and might have impacted the data. Although 73% of the participants worked in online and blended doctoral programs, 20% had engaged in e-mentoring only because of the pandemic and might have therefore had different e-mentoring experiences from those working in online/blended doctoral programs. Additionally, over 61% of the participants held ranks at the (clinical) associate or full professor level, and their experiences might be different from junior or adjunct faculty. The response bias due to the self-reported nature of survey data also cannot be ignored, as the faculty who participated might have been different from those who were not able to do so due to other commitments during the pandemic or did not want to participate.

Discussion and Implications

The strategies that faculty found most helpful and least helpful during their e-mentoring of dissertations are discussed here in the context of prior literature and organized according to the sections in the survey: technology use in e-mentoring, strategies related to communications and expectations, strategies related to research processes, strategies related to emotional and social support for students, and institutional support (Figure 1). It is important to acknowledge that strategies in some sections could be related, for instance, communication and expectations are most likely focused on research process mentoring, and that all these areas together contribute to successful e-mentoring. Suggestions for future research are made within each section.

Figure 1

Helpful Technologies, Strategies, and Support for the e-Mentoring of Dissertations



Technology Use in e-Mentoring

Faculty in this study used email, videoconferencing, word processing, and phones most often when e-mentoring students doing dissertations, which is consistent with prior research that documented faculty use of Skype, Adobe Connect, Google Hangout, and phones (Andrew, 2012; Guerin & Aitchison, 2021; Kumar et al., 2018; Kumar & Johnson, 2019; Roumell & Bolliger, 2017). Given that this survey was conducted during the COVID-19 pandemic when many academic institutions had moved to a remote environment, faculty would not have had access to their offices and would have had to use personal phones with their students, which raises questions about the blurring of boundaries between personal communication tools and those provided by their institutions. This trend is, also, not reflected in their use of social media, which only 9.5% of faculty in this study used with their mentees, but which is highlighted in the literature as increasingly prevalent (Byrnes et al., 2019; Crosta et al., 2018, Gumbo, 2019).

Sixty-two percent of participants used collaborative document sharing (e.g., Google Docs, Office 365) and 54% used shared storage technologies (e.g., Dropbox) with their mentees. The value of these collaborative resources for both faculty and students has been highlighted in prior research by Guerin and Aitchison (2021), Kumar et al. (2018), and Kumar et al. (2021). An interesting finding was also the use of LMSs for e-mentoring by 47% of faculty, because dissertation e-mentoring often does not take place within online courses or seminars, but as individual dissertation credits and individual meetings at U.S.-based universities. These results suggest that faculty use LMSs, which are closed and protected spaces, with resources for e-mentoring usually provided by their institutions, whereas prior research has mainly described the use of videoconferencing software and shared storage. Future research could explore the different virtual spaces that are used for e-mentoring during dissertations, and how they are used. Furthermore, the provision of technologies and virtual spaces by institutions relates to convenient access for both faculty and students and also to the security of data and communications.

The mean number of technologies used by faculty for e-mentoring was 6.35, making it clear that faculty need to be familiar with a variety of technologies to e-mentor students effectively at a distance, and need to be able to choose, use, and manage appropriate technologies (Kumar et al., 2013). These results emphasize the need for faculty technology competencies for e-mentoring that not only encompass technical skills, but also online communication skills, online teaching skills, and online managerial skills (Schichtel, 2010). The results also highlight the importance of institutional resources and learning opportunities for faculty to develop those competencies both before they begin supervising students remotely and during the e-mentoring process (Bender et al., 2018; Deshpande, 2017; Erichsen et al., 2013; Zhang et al., 2020).

Communication and Expectations Strategies

The section about strategies related to communication and expectations had the largest number of items in the survey, the highest mean score, and the lowest standard deviation, indicating that these strategies are extremely helpful to faculty who e-mentor dissertation students. The most helpful strategies to faculty were giving constructive feedback, discussing expectations, meeting regularly synchronously with mentees, and responding to mentees in a timely manner. These strategies appear to be best practices for e-mentors because they are also reflected in several prior studies about faculty e-mentoring strategies (Kumar & Johnson, 2019;

Nasiri & Mafakheri, 2015; Roumell & Bolliger, 2017), and are also supported by students' perspectives in the literature when being e-mentored through the dissertation process (Kumar & Coe, 2017). For instance, Erichsen et al.'s (2014) survey found that effective communication on the part of the supervisor, outlining a timeline, the clarification of the process and roles in the relationships, and timely feedback were the strategies found most effective by students who were e-mentored during dissertations. These strategies play an important role in helping online students who are not immersed in academic culture understand the expectations of their doctoral programs and universities, and also in increasing e-mentors' understanding of their mentees and their individual situations. These findings reinforce the proactive role faculty supervisors have to take when e-mentoring students working on dissertations in the online environment, driving the process and communications, and providing structure.

The only item in this section with a mean rating below 4.29 was "Complete a formal mentoring contract or mentoring agreement" (M = 3.12), which was also rated as not applicable by 46% of the respondents. Although a suggested strategy in the literature (Andrew, 2012; Jacobs et al., 2015; Kumar et al., 2020) that is helpful to ensure common expectations and progress, the results indicate that institutions in the U.S. where most of the participants worked do not suggest or require the use of a formal mentoring agreement during the dissertation process.

Research Processes Strategies

While research is often the focus of communications and feedback during the e-mentoring of dissertation students, this section contained strategies related to research processes. The four strategies faculty found most helpful during e-mentoring were providing resources and an overview of the dissertation process and assisting their mentees with the IRB review and data analysis. These strategies have also been reported as useful by students and faculty in prior research on online and remote supervision (Jameson & Torres, 2019; Kumar et al., 2018; Kumar & Johnson, 2019; Norcross et al., 2020). In the absence of opportunities to observe and learn from peers and faculty engaged in research and dissertations in an on-campus environment, these strategies model and demystify the research process and contribute to online doctoral student success. However, the item with the lowest mean in this section was "encouraging students to utilize a peer review process," which contradicts previous research findings by Kumar et al. (2021) and Kumar and Coe (2017) where both faculty and students found peer review and feedback to be helpful. Almost 13% of faculty rated engaging in collaborative research as not applicable, which is understandable in online or blended programs where students are often full-time professionals and conduct research in their professional environments.

Sixty-eight percent of participants also rated the item "connect mentees with peers or experts with research-related expertise" as helpful or very helpful, further emphasizing the importance of helping online students connect with others engaged in similar research beyond one institution. The ways in which online doctoral students or those conducting research remotely network and learn from the expertise of other researchers in the field, not only in their program, is an area that merits further research. Eighty-four percent of participants in this study identified their discipline as education. Future research can focus on specific e-mentoring strategies related to research processes in various disciplines, the types of research conducted, expectations within the research, and the research guidance needed might differ across disciplines and necessitate different strategies in the online environment.

Emotional and Social Support Strategies

The importance of providing psychosocial support in addition to academic support and professional development has been well-documented in previous literature on supervision and e-mentoring of doctoral dissertations (Andrew, 2012; Erichsen et al., 2014). Student well-being and strategies for reducing isolation, increasing social support, and staying connected during the dissertation process gained renewed attention during the COVID-19 pandemic (Bendrups et al., 2021; Kumar & Wisker, 2021). The results of this study reinforce these developments, with faculty rating "adapting mentoring strategies based on mentees" and "providing emotional and social support" as the most helpful e-mentoring strategies in this section. While this is true of all dissertation supervision, an understanding of the unique contexts in which students live and work at a distance from the university, and their cultural backgrounds can greatly help e-mentors succeed in their e-mentoring. Individualized e-mentoring can also contribute to students feeling more connected to their e-mentors and the research process.

Other items in this category that were found helpful were discussing time management strategies and helping students to develop an online community. Unlike previous literature that has discussed the benefits of group and peer mentoring (Kumar et al., 2021; Norcross et al., 2020), only 17.5% of faculty in this survey found mentoring students in groups to be very helpful or helpful, with this being considered the least helpful strategy in this section. The item, however, did not apply to 12.7% of participants, indicating that they probably did not engage in group mentoring or did not have experience with it. Given that individualized student e-mentoring was most helpful to the participants in this study, it is understandable that group e-mentoring was not perceived as helpful. However, group e-mentoring has been documented as a form of social support and online community-building for students at a distance or in online doctoral programs (Bendrups et al., 2021; Kumar et al., 2021). Further research could help us understand how individualized and group e-mentoring could best be combined to achieve the benefits of both forms of mentoring, and what kinds of strategies could make group mentoring effective.

Institutional Support

Institutional support has been highlighted in the literature as essential to the success of both e-mentors and students who are being e-mentored (Deshpande, 2017; Kumar et al., 2018; Roumell & Bolliger, 2017). However, in this survey, the institutional support subscale had the lowest mean rating of all subscales. At the same time, several items in the section contained high percentages for the "not applicable" option. The question asked of faculty was "How helpful have you found the following institutional resources when e-mentoring students during the dissertation phase?" The high percentage of "not applicable" responses suggests that faculty did not rate items in this section because they were not available or applicable to the institutions in which they worked, or that they had had no experience with these forms of support.

The most helpful form of institutional support was data analysis software for online or remote students, which is understandably crucial for research, but can be very expensive for both faculty and students to buy. Institutional provision of software for quantitative and qualitative data analysis can provide them with common tools and reduce challenges for both faculty and students. For instance, faculty might have access to such software at their institution, but if the students are located in other parts of a country or overseas, they might adopt other free software with which faculty are unfamiliar. Providing institutional access through VPN or other means can help students and faculty. Dedicated librarians and information literacy instruction that are

extremely important for students at a distance to access literature and appropriately situate their research (Kumar & Dawson, 2018) were also rated highly. Incentives for faculty who e-mentor dissertations/theses had the second highest mean but was also rated as not applicable by 44.4% of the participants. The findings indicate that institutions do not provide enough incentives to support faculty who work with online or blended doctoral students on dissertations, although they work with many mentees (the mean number of mentees in this study was 7.48), but that when provided, these are valued greatly by the faculty.

The item rated as least helpful in this category was professional development for the e-mentoring of student research, which was also rated as not applicable by 41.3% of participants. This might indicate that these participants do not have access to professional development in this area or are unaware that it exists. This is an interesting finding that needs further research because supervisor development has long been documented in the literature as effective and valuable for dissertation supervision (Jameson & Torres, 2019; Roumell, & Bolliger, 2017; Steinert et al., 2016). If faculty are to successfully e-mentor students through the dissertation process and guide their research while using multiple technologies effectively, providing psychosocial support, and driving and managing communications and expectations in the online environment, formal professional development should be provided by institutions.

Professional development can also include resources, tutorials, faculty communities or sharing sessions. It is also possible that such programs and resources exist at institutions, but that these resources are focused on face-to-face supervision and not on the e-mentoring of doctoral students' dissertations. Given the move to remote supervision during the pandemic, and the continued e-mentoring of students for various reasons, professional development for faculty that is specifically targeted at dissertation e-mentoring is needed (Huet & Casanova, 2021).

Conclusion

This article highlighted the various strategies that faculty find most helpful during the e-mentoring of students doing dissertations. In the context of the increased adoption of e-mentoring during and following the COVID-19 pandemic, identifying strategies that are more or less helpful for e-mentoring can be valuable to faculty members embarking on or engaged in the e-mentoring of dissertation students, especially if they were mentored in on-campus environments, where opportunities for communication, learning, and research abound within research apprenticeships and campus communities. The results of our survey can be useful to faculty and doctoral programs engaged in e-mentoring, as well as academic developers focused on online supervision as various forms of online supervision and e-mentoring continue to play a role in the continuing pandemic/post-pandemic world.

Declarations

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

The authors assert that approval was obtained from an ethics review board at the University of Florida and Texas A&M University, USA.

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