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Best Practices for EdD Comprehensive Exams and Capstone Projects

Students' Attitudes and Perspectives of Outcomes in an Online Program

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ABSTRACT

This research was guided by a problem of practice experienced by an EdD program, which transitioned to a fully online modality during the pandemic and rapidly grew in enrollment. The problem evaluated was ensuring the redesigned program milestones – capstone and comprehensive exam – are feasible given the size of the program. The current study utilized descriptive research design to provide a comprehensive description of educational phenomena. The study was conducted at a large, public research university in the South. A total of 316 students enrolled in the program and were invited to complete the survey, of which 131 responses were analyzed. Results revealed differences in students' attitudes toward capstone projects and comprehensive exams, with a strong correlation between students' experiences with capstone projects and comprehensive exams and their overall academic self-efficacy while in the program.

KEYWORDS

higher education, online, graduate education, EdD, outcomes

INTRODUCTION

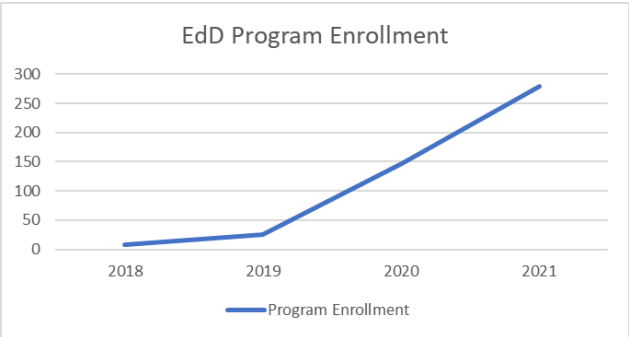
With the global expansion of terminal degree programs, the experiences of doctoral students have been studied extensively in recent years. However, the same argument cannot be made for students in fully online doctoral programs, especially with respect to factors fostering their progress and persistence (Rockinson-Szapkiw et al., 2016). The available research, however, does not portray a favorable picture. While the attrition rate for doctoral students in traditional programs averages 50%, the attrition rate for their peers in limited-residency and online programs was estimated to be 10% to 20% higher (Terrell et al., 2016).

The mentorship of students in online doctoral programs warrants increased scholarly focus as students opt for this instructional modality to accommodate a range of professional and personal responsibilities. Therefore, carefully developed program design and strategically implemented mentorship practices, sensitive to individual circumstances, are of critical importance for this student group. To date, the research on online doctoral programs has been limited to several studies of student and faculty experiences (Deshpande, 2016, 2017; Templeton et al., 2015, Thompson et al., 2018), faculty supervision practices (Roumell & Bolliger, 2017), and online dissertation supervision (Kumar & Johnson, 2019; Rademaker et al., 2016). Despite the popularity and rapid expansion of professional doctoral programs, mainly the Education Doctorate (EdD), very little attention has been devoted to the online mentorship of doctoral students in these tracks.

This research was guided by a problem of practice experienced by an EdD program, which transitioned to a fully online modality during the pandemic and rapidly grew in enrollment. As illustrated in Figure 1, over the past three years, the EdD program has recorded a drastic increase in enrollment reflected through the following numbers – 8 students in 2018, 26 in 2019, 147 in 2020, and 279 in 2021.

This growth was largely a result of shifting to an online synchronous format as well as restructuring the degree requirements

Figure 1. Enrollment Growth



by adding a capstone project in place of a traditional dissertation. The growth caused several challenges for the program faculty tasked with mentoring students and ensuring their progress and retention. The main problem experienced was ensuring that the redesigned program milestones – comprehensive exams and capstone projects were feasible to implement given the size of the program and a small number of faculty. Second, we needed to ensure that these milestones maintain the intended rigor but are attainable by students of all abilities, academic backgrounds, and professional experiences. Thirdly, we sought to develop evidence-based practices for faculty mentorship and support initiatives designed to prepare students for these milestones. To accomplish these objectives, we investigated the following research questions:

1. What are students' attitudes and perspectives regarding the purpose, design, and outcomes of EdD comprehensive exams and capstone projects?
2. Are there differences in students' attitudes toward comprehensive exams and capstones based on their demographic and professional backgrounds?
3. What is the relationship between students' attitudes toward comprehensive exams and capstone projects and other areas of their doctoral experience?

Positioning this research in a way that would allow for gathering student perceptions about their program experience was critical as the program growth naturally led to increased student diversity by welcoming learners of varied demographics, professional experience, and prior knowledge. The four-year program growth from 8 to 279 students created a need for implementing an approach that would allow us to understand program experiences and expectations of our students so that we could build on their academic strengths and positive program experiences or address their unfulfilled needs. As all our students are higher education professionals, we saw the value in not only soliciting their feedback as students, but also their perceptions as higher education professionals.

LITERATURE REVIEW

Online Doctoral Programs

Factors associated with performance and retention in online courses have received considerable attention in past research, but very few studies have focused solely on doctoral-level classes. Online doctoral students identified many barriers to their academic progress. Some scholars noted these as the frustration with a lack of face-to-face dialogue with faculty and peers, technological challenges, and the need for more support (Deshpande, 2016). Others attributed it to unfamiliarity with library resources, especially those resources needed for completing assignments (Kumar & Dawson, 2012). While some scholars discovered that students in fully online doctoral programs have been, on average, less satisfied with their academic experiences than their peers due to difficulties in establishing a work-life-school balance, limited interactions with chairs and peers, lack of clarity and structure in their studies, procrastination, and lack of motivation (Erichsen et al. 2014).

At the same time, students in online doctoral programs reported several factors which, they believed, promoted their progress and retention. For example, a clear program structure, its relevance to professional practice, and faculty support and expertise in online teaching were all identified as critical components of students' experiences (Kumar & Dawson, 2012). Additionally, students shared that being provided with clear grading criteria, course expectations, and a description of academic terminologies was advantageous for their success (Deshpande, 2016). Other scholarly evidence identified best practices in this domain as students receiving frequent and timely feedback, having clear communication about expectations and deadlines, participating in small group mentoring, and forming positive relationships with their mentors (Erichsen et al*.,* 2014).

From a faculty perspective, facilitating weekly meetings and regular communication among the instructional staff emerged as instrumental in providing consistent information to students (Kumar & Dawson, 2012). Other positive factors identified by faculty included providing timely and good-quality feedback, continuous mentoring and support, promoting peer-to-peer interactions, and pairing new and experienced faculty members (Deshpande, 2017). The importance of careful deliberation about the program and instructional design was further reflected in the finding that personal factors played an equally important role in student integration in online doctoral programs, as did the program variables (Rockinson-Szapkiw et al., 2016). Additional evidence-based practices that emerged from the research include faculty establishing trust with their students (Rademaker et al*.,* 2016), positioning themselves as guides instead of supervisors (Fedock, 2017), and acknowledging students' academic strengths by providing resources for advancing them (Rademaker et al*.,* 2016).

EdD Programs and Dissertation Models

Contemporary literature illustrates a wide and ongoing scholarly interest in the best practices for online supervision of traditional dissertation projects. Yet very few studies to date have examined the mentorship of doctoral students in EdD programs, especially with respect to completing alternative dissertation projects. According to the Carnegie Project on the Education Doctorate [CPED] (n.d.), the objective of EdD programs should be to enable educators to create new knowledge and serve as stewards of the profession by applying evidence-based practices. Accordingly, EdD programs should be designed to produce scholarly practitioners equipped to solve problems of practice (CPED, n.d.). Similarly, Perry (2016) defined the academic and career path of EdD scholars as becoming transformative leaders in educational practice.

The most common examples of final deliverables in EdD programs include traditional dissertations, applied dissertations and dissertations in practice, or program-specific capstone projects. Since EdD programs have rapidly expanded, both in the United States and globally, many scholars have attempted to identify the most appropriate and effective final deliverable. According to Murphy (2007), many universities, especially research-intensive ones, neglect the needs of practice by prioritizing research culture and relying solely on dissertations as the final milestone in doctoral student work. On the other hand, Murphy (2007) argues, a central goal of a professional program such as an EdD is to gain answers and solutions to real problems (i.e., problems of practice), many of which cannot be solved with a traditional dissertation format. Hence, alternative modalities must be considered. Perry (2016) supported this stance by pointing out that most practitioners struggle to apply the research preparation and traditional dissertation from a PhD program into their professional contexts. Ryan et al. (2012) further noted that, although the objectives of EdD and PhD programs may overlap, they must function as separate programs with substantially

different mission, content, format, and learning goals, including their final deliverables.

Proposing a model for differentiating between MEd, EdD, and PhD programs, Young (2006) advocated for the use of capstone projects in MEd programs and dissertations in EdD tracks. Still, her definition of an EdD dissertation is quite comparable to that of Murphy (2007) defining it as an applied research project aimed to inform educational practice. In their faculty guide to supervising action research dissertations, Herr and Anderson (2015) offer a similar definition. Unlike the traditional dissertation format, which aims to make generalizable knowledge, action research dissertations combine scholarship with an inquiry, reflection, and one's practical work to produce knowledge that can be applied in the setting under study. Belzer and Ryan (2016) defined dissertation in practice as a dissertation that matters, with mattering being described as impact on one's practice, roles, relationships, professional positions, and a stance as a scholarly practitioner. CPED (n.d.) defines a dissertation in practice as scholarship investigating a complex problem of practice, with a problem of practice being defined as "persistent, contextualized, and specific issue embedded in the work of a professional practitioner" (para. 15).

The perceptions of the EdD program faculty regarding this issue portray a similar narrative. Even though faculty agree that EdD and PhD dissertations must demonstrate the same research rigor, EdD capstone projects must not be seen as deliverables that will collect dust on the shelf and must have immediate use at their local institutions (Auerbach, 2011). For this goal to be accomplished, the EdD's final project must address timely and relevant problems of educational practice and lead to a change or transformation in educational practice.

Even though the debate still persists as to whether EdD scholar-practitioners should be required to complete a traditional dissertation, the analysis of EdD coursework reveals a stance in favor of alternative capstone projects. A recent analysis of educational leadership doctoral programs at 103 institutions revealed that PhD programs required an average of 8 more credits for completion compared to EdD tracks, a differential most likely to be reflected in the research methods and dissertation credits. On the other hand, EdD tracks included more required or core courses, thus reflecting their structured, community-of-practice focus, different from the independent research model embraced by most PhD programs (Topolka-Jorissen & Wang, 2015). Still, scholars acknowledge the fact that the selection of appropriate research courses remains of the main challenges in defining and transforming EdD programs (Bengtson et al. 2016; Marsh et al., 2010). Some of the recommendations offered for overcoming this challenge include making EdD research courses more practical, restructuring them as inquiry courses, and combining research-oriented and content-oriented courses into a single course (Bengtson et al., 2016).

EdD Programs and Comprehensive Exams

Comprehensive exams date to 13th-century French monasteries but are still used today in most doctoral programs. Much of the research on comprehensive exams are focused on the PhD and the role of the exam as a gatekeeper before the dissertation. Further, much of the literature is outdated and comes from non-education disciplines (Bentley, 2013; Ehrenberg et al., 2007; Estrem & Lucas, 2003; Furstenberg & Nichols-Casebolt, 2001; Grover, 2007). There is very little research that focuses on the role of the comprehensive exam in online EdD programs (Capello, 2022).

Capello (2022) described comprehensive exams as a bridge between students' coursework and dissertation. This bridge, as noted, should serve multiple purposes, the main of which should be reinforcing content knowledge. However, not all EdD programs require a dissertation, so the comprehensive exam does not serve as a gatekeeper, rather it can be an opportunity for summative assessment focused on how well students can integrate what they have learned in disparate courses, including content mastery, critical thinking, and knowledge synthesis (Capello, 2022).

Capello (2022) indicates that not only are students unclear about the purpose of comprehensive exams, but faculty often disagree as to the purposes of the exams. Comprehensive exams, while they may be valuable in acting as a gatekeeper for some programs, are often a stumbling block for students. Sverdlik and Hall (2020) found that the comprehensive exam caused the most anxiety for students, and out of all phases of doctoral study, it was at the comprehensive exam that students reported lower motivation, lower levels of well-being, and lower self-efficacy. Capello (2022) further noted that, in addition to causing stress for students, comprehensive exams also negatively impact students' confidence in the program and affect their scholarly identity development.

Community of Inquiry (CoI) Framework

This study was theoretically guided by the community of inquiry (CoI) framework developed by Garrison et al. (2000). CoI framework, commonly used in the research on teaching and learning in an online environment, identifies three foundational elements critical for successful implementation of online programs – social presence, cognitive presence, and teaching presence. Kumar et al. (2011) advocated a unique use of CoI in cohort-based online EdD programs, which are characterized by stronger teaching and cognitive presence than social presence. The applicability of the CoI framework in EdD programs is further supported by the mentoring guidelines of the CPED (n.d.) that prioritize community of learners, peer support, and relationship building.

According to Garrison et al. (2000), social presence refers to the learner's ability to connect with others not only socially, but also emotionally through group cohesiveness and bonding. Cognitive presence implies a learner's willingness to construct knowledge through inquiry, exploration, reflection, and application. Teaching presence, on the other hand, includes instructional support provided to learners for fostering social and cognitive presence.

Given the purpose of this study, our primary goal in applying the CoI framework was to investigate how teaching presence can be best designed and implemented to promote social and cognitive presence in an online EdD cohort. Additionally, we dedicated a particular focus on understanding the factors underlying students' social and cognitive presence in the critical program milestones – comprehensive exams and capstone projects. Overall, our goal was to analyze our program design and mentorship practices and identify the strategies that can most effectively promote CoI components.

METHODS

The setting for this study was a Carnegie R1 institution with very high research activity. The Higher Education Administration

EdD program is a 54-hour, fully online, synchronous program designed to meet the needs of working professionals. In line with the CPED framework, the program outcomes focus on the development of emerging leaders in the field of higher education and creating scholar-practitioners that demonstrate competence in applied research that results in the improvement of professional practice.

Prior to its redevelopment, the EdD program was modeled after traditional PhD program structures. It was a 66-credit hour, face-to-face program that required a dissertation as the culminating experience. Under the new model, the face-to-face delivery was replaced with a fully online, synchronous modality, and the dissertation requirement was substituted with a capstone project. The program requirements include 54 credits, of which 21 are core hours, nine research hours, 12 elective hours, and 12 capstone hours.

Comprehensive Exams

All students take comprehensive exams in their second-to-last or last semester (as per the student's choice). The exams are offered each semester (fall, spring, and summer) and are completed online via the Learning Management System. Exams consist of three essay questions, with each assessing the student's knowledge from multiple core courses taken as a part of their required coursework. Students must pass all three exams to be eligible to graduate. All three exams must be completed within one week, but each exam is timed separately to 120 minutes, so students can space out the exams over the week as they prefer. Each exam is scored (Pass with Distinction, Pass, or Rewrite) by two faculty with a third faculty member scoring only if the first two disagree. Students have one opportunity to rewrite any exam questions that are scored as Rewrite.

Capstone

The 12 capstone hours are embedded in students' coursework and taken as four courses in their second and third years. Following the CPED (n.d.) framework, students plan and implement an applied research project that addresses a problem of professional practice. The Capstone is the keystone EdD research project that enables students to put into practice what they learn throughout the program and demonstrate their abilities to be higher education scholar-practitioners. Over the four semesters, students complete Chapter 1: Introduction (Capstone I), Chapter 2: Literature Review (Capstone II), Chapter 3: Methods and Data Collection (Capstone III), and Chapter 4: Results and Discussion (Capstone IV). Capstone projects do not have a proposal or final defense, but in their last capstone course, all students deliver a formal presentation of their research projects. These presentations are open to all students and faculty in the program to attend.

Unlike dissertations, capstone projects do not require a student to secure a committee. Instead, the capstone instructor serves as the student's capstone advisor. When the program was first redesigned, the students took the entire capstone sequence with the same instructor, one of the full-time program faculty. However, due to the rapidly growing number of students and the small number of full-time faculty, there was a necessity for some capstone sections to be taught by adjunct faculty. To ensure equity in students' experiences, students can now change their capstone instructor each semester when they enroll in the next capstone section. This accommodation was implemented so that students would have an opportunity to work with different instructors or change an instructor throughout the process if they wished to do so. Unfortunately, this accommodation also meant that students might not be able to work with the same instructor throughout their entire capstone sequence (e.g., if the instructor's section reaches a full enrollment capacity for the semester, if they are not assigned a particular capstone course that semester, etc.).

Research Design

This study was designed as cross-sectional survey research as we sought to investigate and assess a set of educational practices at one point in time. Survey research design is particularly suitable for investigating educational practices that are not easily observable, such as participants' attitudes, perspective, and opinions (Gall et al., 2003), all of which were the objectives of this study. Guided by our research questions, we utilized a survey questionnaire to investigate students' perspectives about two critical aspects of their program experience and to compare their reported attitudes.

Participants and Data Collection

The findings presented in this study were obtained from the data collected as a part of a large-scale program evaluation that took place in the fall of 2022. A total of 316 students enrolled in the EdD program at the time of data collection were invited to complete an online questionnaire regarding their program experience. We utilized a convenience sampling due to access to the study population we had as faculty in the EdD program. We recruited participants by posting an announcement into a Learning Management System to which all students in the program have access. In the announcement, we invited all students to complete our program evaluation survey and explained the voluntary nature of participation. As student participation was anonymous, they could choose to opt out and not participate without fear of any adverse action from researchers and program faculty. Similarly, due to anonymous participation, students did not feel coerced or forced to take part, meaning that all students who completed the questionnaire did so voluntarily and with the intent to provide honest and actionable feedback about their program experience. From 316 students who were invited to participate in the program evaluation, 153 responded to the invitation. Of this number, 22 responses were incomplete, resulting in the final sample of 131 responses or a 41.5% response rate.

Instrument

The questionnaire used for the program evaluation consisted of several sections, not all of which are reported in this study. For this research, we utilized only those sections that investigated students' attitudes, perceptions, and experiences related to comprehensive exams and capstone projects. Given that students start capstone projects in their second year, all survey respondents had an option to skip the questions pertaining to capstone if they had not yet started the process. Similarly, as students take comprehensive exams in their third year, they have an option to skip the questions pertaining to comprehensive exams if they have not yet taken them. The questionnaire also included demographic questions related to student's academic level, master's degree focus, years employed in

higher education, type of educational institution employed at, and their role.

We were, however, limited with respect to the demographic variables we sought to collect for this study so as not to breach participants' anonymity. To ensure their anonymity, we chose not to ask for students' gender or race as we realized that reporting these data would make them less likely to participate in our program evaluation for the concern of being identified. Still, having the data on students' race and gender could have provided additional comparisons and insights, especially with respect to assessing the extent to which our pedagogical and programmatic practices are inclusive of all students represented in the program. The following section explains the statistical procedures used to answer our research questions and presents the results obtained.

RESULTS

To describe the demographics of our sample, we conducted descriptive statistical analyses using SPSS statistical software. According to the results, most students who responded to the survey were in their third year (n=58, 44.3%) or in their second year of the program (n=52, 39.7%). The least represented were first-year students (n=21, 16%). A greater proportion of students had a master's degree in education-related fields (n=86, 65.7%) compared to the students with non-education degrees (n=45, 34.3%). Most respondents had between five and 15 years of higher education experience (n=63, 48.1%), with fewer students having less than five years (n=36, 27.4%) or more than 20 years of professional experience in higher education (n=32, 24.5%). With respect to their employment, most students worked in public, four-year universities and held administrative roles with aspirations to transition into leadership positions upon obtaining their EdD degrees.

Our first research question aimed to investigate students' attitudes and perspectives regarding the purpose, design, and outcomes of EdD comprehensive exams and capstone projects. To accomplish this objective, we conducted descriptive statistical analyses. Table 1 presents means, arranged in descending values, for students' responses using the five-point Likert-scale (with 1 indicating least agreement and 5 indicating most agreement with presented statements). As illustrated, students agreed most with the statement that comprehensive exams should assess students' abilities to apply their knowledge in real-life scenarios, while they least agreed with the statement that exams should be a required component of EdD programs. Regarding capstone projects, students most strongly concurred with the statement that capstones should be used as professional portfolios in future job searches but displayed the least belief that their coursework adequately prepared them for this milestone.

Our second research question investigated if there are differences in students' attitudes toward comprehensive exams and capstones based on their demographic and professional backgrounds. First, we conducted independent samples t-tests to test for the differences between students with master's degrees in education-related fields and those with degrees in non-education-related fields. The results revealed that students with education-related master's degrees had significantly higher perceptions that their EdD coursework adequately prepared them for comprehensive exams compared to their peers with non-education-related degrees ($p < 0.05$, $t = 1.15$, MD = .22). Additionally, students with education-related master's degrees had a significantly stronger belief that the capstone project should be related to their professional practice ($p < 0.05$, $t = 1.85$, MD = .35). Next, we conducted a one-way ANOVA to test for the differences based on the number of years employed in higher education, type of educational institution employed at, and professional role. No statistically significant differences were found based on these variables.

Table 1. Student Attitudes Toward Comprehensive Exams and Capstone Projects

Area	M	SD
Comprehensive Exams (Comps)		
Comps should assess students' abilities to apply course content in real-life settings	3.66	1.35
Comps should assess students' knowledge of the course content	3.35	1.35
Your coursework has adequately prepared you for comps	3.31	1.05
Current requirements for comps are appropriate in terms of the associated workload and rigor	3.10	1.31
Comps should be a required part of the program curriculum	2.52	1.44
Capstone Projects		
Students should be able to use the capstone as a part of their professional portfolio in job search processes	4.79	.55
Current capstone requirements are appropriate in terms of the associated workload and rigor	4.56	.85
The capstone project should provide students with an opportunity to engage in publication and/or conference presentation	4.55	.8
The capstone project should be related to the student's professional practice	4.46	1.02
Your coursework has adequately prepared you for capstone	4.34	1.1

Our third research question sought to answer if there is a relationship between students' attitudes toward comprehensive exams and capstone projects and other areas of their doctoral experience – motivation to enroll in the program, self-efficacy, perceived program outcomes, and professional development aspirations. To answer this question, we conducted a Pearson correlation analysis. As illustrated in Table 2, we discovered that students' attitudes toward both comprehensive exams and capstone are significantly correlated with their self-efficacy and perceived program outcomes but not correlated with their motivation to enroll in the program or professional development aspirations. In other words, the higher their self-efficacy, the more favorable a student's perspective will be toward their comprehensive exams and capstones. Similarly, the more impact they believed the program had on them, the more likely they will be to have positive attitudes toward these two milestones.

Our last objective was to solicit students' personal and professional insights regarding the most effective design and implementation of comprehensive exams and capstone projects in rapidly growing online programs. Specifically, we used open-ended survey questions to ask students to share their concerns and recommendations regarding their experience with comprehensive exams and capstone. We analyzed their responses using qualitative NVivo software and thematic data analysis and identified several overarching themes for each construct.

Regarding students' experiences with comprehensive exams, three major themes emerged – resistance, preparation, and redesign. In their open-ended responses, most students expressed strong resistance toward the fact that comprehensive exams are an EdD program requirement and suggested it be waived. Most justified their stance, arguing that their content knowledge has already been assessed in core courses and the capstone should be a sufficient milestone assessing their abilities to apply that knowledge. In discussing comprehensive exams, students referred to them as antiquated, outdated, redundant, and unnecessary, with some even describing this requirement as insulting. Another justification for such perspectives was arguing that comprehensive exams cause stress and anxiety, thus negatively affecting students' well-being and mental health. Additionally, students postulated that the time spent preparing for comps would be better invested in producing a well-rounded and well-written capstone project that can lead to a publication. Some students raised the question of equitable teaching, preparation, and mentorship received in their core courses depending on the instructor they had (e.g., a full-time faculty versus an adjunct), while others noted that comps are not relevant to everyone's pathway. A few arguments were made that, by design, comps imply a professor's inadequacy to definitively assess students' course knowledge. However, these perspectives were challenged by other students who, even though less represented, strongly argued for keeping this program requirement, describing it as appropriate as it improves the quality of their degree.

The theme of preparation comprised students' perspectives regarding the most effective practices they believed would best prepare them for the comprehensive examination. Unsurprisingly, most students believed that major preparation should be provided in their core courses and, again, raised the question of equity due to their differing experiences with instruction, assessment, and feedback received in these courses. As one student simply put it: "I feel that some courses have been better at preparing me for comps than others." Students who agreed with this perspective shared that they would have appreciated more lecture-based and structured instruction in their core courses instead of discussion-based approaches, while others emphasized the need for faculty teaching core courses to make explicit connections between their content and comprehensive exams. Given that students take comps in their third year, several recommendations were shared that guidelines about comps should be disseminated much sooner through formal and informal information sharing. In that regard, students reported overwhelmingly positive feedback for the comps information session that the program implemented for the first time shortly before students responded to our survey.

The theme of the redesign included the recommendations that students shared regarding the most optimal structure and implementation of comprehensive exams. The most prevalent was the perspective that the examination should be spaced out by taking one exam question each year. Specifically, students suggested taking each exam question in the year in which the corresponding core courses were taken. A particular focus in student feedback was placed on the timed structure of the exam, which students referred to as a "pressure cooker" and suggested it be eliminated. Lastly, students overall agreed that the examination should be redesigned to provide more opportunities for incorporating critical thinking skills, applying the content to real-life experience, and "keeping the questions real."

With respect to students' capstone experience, the following four themes emerged – equitable teaching, mentor-mentee relationship, research foundations, and connection to professional practice. The theme of equitable teaching was the most prominent among students' comments and built on previously mentioned concerns of students' perceived differences in the quality of instruction received based on the instructors they had. Overall, students expressed strong dissatisfaction with having some of their capstone courses taught by adjunct faculty. Some students revealed sharing their capstone experiences with their peers and discovering inequalities in the scope of resources, mentorship, and feedback provided in their corresponding capstone courses. This theme was inextricably connected with the theme of mentor-mentee relationship, which referred to students' collective preferences for keeping the same capstone faculty for the entire capstone sequence. They described this model to be "both academically and professionally beneficial" but also practical in terms of aligning their work with the expectations of one professor only. Many students referred to their capstone instructors as mentors and noted the disappointment they experienced when they had to continue their capstone sequence with another instructor.

The theme of research foundations referred to students' experiences with and preferences for taking research foundation courses. Under the current program structure, students take nine credits, or three research classes spaced out over their first and second years. Overall, students were not satisfied with this structure as it means that some research courses are taken concurrently with their capstone classes. Most students agreed that all research courses should be taken in advance of the capstone sequence or, if that is not possible, that research courses be ranked in reference to their relevance to the capstone (i.e., those most relevant to the capstone should be taken first). The next sub-theme that students felt very strongly about was their preference for research courses to be taught by their program faculty instead of the research faculty. They justified this stance by arguing that having research courses housed outside of the EdD program leads to a diminished ability to acquire and apply research skills relevant to their capstone. Namely, the fact that research courses service students from multiple doctoral tracks make their content less applicable to higher education settings which, as students argued, are unique compared to other educational settings.

Lastly, the theme of connection to professional practice mainly comprised the comments in which students expressed their appreciation for the opportunity to immediately apply their capstones to addressing problems of practice and, in doing so, to advance professionally and to "enhance their unit, department, or college." However, a number of students also expressed the preference for researching "a topic of interest" instead of "a problem of practice" as they do not want to be limited to their current practice. This approach, they argued, would allow them to use their capstone to transition into other domains of higher education – an opportunity they may not have otherwise.

DISCUSSION

We conducted this study to identify best practices for mentoring online EdD students in two important program milestones – comprehensive exams and capstone projects. In doing so, we discovered the differences in students' attitudes toward these important milestones based on their master's degree areas but not

based on the number of years employed in higher education, the type of educational institution employed at, or their professional role. Further, we noted a strong correlation between students' experiences with comprehensive exams and capstone projects and their overall academic self-efficacy while in the program. In sharing their feedback about comprehensive exams, students expressed strong resistance toward this requirement while proposing different practices they believed would best prepare them for the examination and their recommendations for the most effective structure and implementation of the exams. With respect to capstone projects, students were most vocal about the need to make this part of the program experience equitable by ensuring the comparable quality of instruction across all capstone classes. Additionally, they expressed a strong preference for their capstone projects to be actionable and immediately applicable to their practice.

A particular significance of these findings is reflected in the fact that this research contributes to the scarce literature on students' experiences with comprehensive exams in education-related fields. Despite the scholarship related to comprehensive exams being outdated, most of it comes from non-education-related disciplines (Ehrenberg et al., 2007; Furstenberg & Nichols-Casebolt, 2001; Grover, 2007) so the need for focusing on students' experiences in online education programs has already been noted (Capello, 2022). While prior research has documented that doctoral students experience low motivation and low self-efficacy while taking comprehensive exams (Sverdlik & Hall, 2020), our findings advanced that knowledge by noting a positive correlation between students' self-efficacy while in the program and their comprehensive exam experience. In other words, implementing proper structures to support students' self-efficacy while in the program may lead to their favorable perspectives about comprehensive exams and, thus, can help alleviate the challenges and stressors noted in prior research.

With respect to the capstone, our findings were consistent with prior scholarship that highlighted EdD students' need for a culminating project experience that would allow for reflection, application, and community-building opportunities (Topolka-Jorissen & Wang, 2015). These same constructs were reported by our study's students who proposed specific models for embedding them in the capstone curriculum, such as offering in-house research classes, fostering mentor-mentee relationships, and ensuring the connection between their capstone and professional practice. The review of prior research conducted for this study has not revealed any studies that specifically investigated how students' capstone experience may be influenced by their overall program experience. While such studies may exist, this research contributes to expanding the scholarly knowledge on this important, but under-investigated topic. In that regard, our findings pointed to several ways in which students' capstone experience may be moderated by internal factors (e.g., students' demographics) and external factors (e.g., other aspects of their program experience).

Reflecting on our findings through the lens of the CoI framework, we noted the interplay that social presence, cognitive presence, and teaching presence can have in fully online programs. Despite the online nature of our program, teaching presence emerged as a highly influential factor in students' program experience and was mainly manifested through forming mentor-mentee relationships with capstone faculty. Social presence was noted as one of the recurring themes in students' experience in comprehensive exams, as most students highlighted the critical role their peers have in fostering learning, communication, and relationships. Lastly, cognitive presence was manifested by students' taking ownership of their learning by constructing meaning, engaging in practical inquiry, and building new knowledge through their capstone journeys. Cognitive presence was further evidenced by students engaging in continuous and critical reflection on these journeys so they could offer us actionable recommendations for how their program outcomes can be improved.

With this study, we aimed to offer practical recommendations for all doctoral student mentors challenged with increased enrollments and workload in online doctoral programs. Specifically, these recommendations introduced novel approaches to EdD comprehensive exams such as providing students with information sessions ahead of the examination, incorporating more lectures into core courses, ensuring that faculty teaching core courses make explicit connection between their content and comprehensive exam, and spacing out examinations by scheduling one exam question per year. Recommendations related to capstone process involved scheduling all research courses to be taken prior to starting capstone sequence, having research courses be taught by EdD program faculty, and having an opportunity to research a topic of interest, instead of a problem of practice, in order to branch out of their current practices and potentially change their career trajectories.

Faculty tasked with supervising students in comprehensive exams or capstone projects may find these recommendations particularly useful. It is important to note, however, that the findings are underlined by two limitations. First, our results were obtained by soliciting feedback from students who were still enrolled in the program at the time of the study. Therefore, it remains to be assessed if and how students' perspectives may change once they graduate from the program and as they continue applying the obtained skills and competencies in their practice. Next, even though our students expressed numerous recommendations for improving our capstone model, none of them have yet completed their capstone projects. Therefore, we will need to reevaluate their perspectives through exit surveys once they successfully complete all milestones and graduate.

Despite these limitations, we hope that the presented practices can serve as a useful starting point for all EdD faculty, staff, and program coordinators tasked with navigating increased enrollments or supervision in critical program milestones. The literature reviewed in this study demonstrated that very little is known about the topics investigated in this research. Therefore, our goal was to advance the scholarship in this field by mapping out the steps for successfully navigating the program growth while maintaining a scholar-practitioner community in critical program areas.

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