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A Review of Dissertations from an Online Asynchronous Learning Design and Technologies Educational Doctoral Program

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ABSTRACT

Practitioner-focused educational doctoral programs have grown substantially in recent years. Dissertations in Practice (DiPs), which are the culminating research report and evaluation method in these programs, differ from traditional PhD dissertations in their focus on addressing a problem of practice and on connecting theories with practice. As part of our ongoing program evaluation, we reviewed DiPs from doctoral students who graduated from an online asynchronous Educational Doctoral program in Learning Design and Technologies at the University of South Carolina. Findings revealed that most students chose a pragmatic philosophical paradigm, adopted a mixed methods research design, reported an action research intervention implemented with populations in K-12 schools, used surveys and interviews as data sources, and analyzed data with descriptive/inferential statistics and thematic analysis. Implications for the program curriculum are discussed.

KEYWORDS

dissertation in practice, educational doctoral program, online program, educational technology

The creation and development of professional doctoral degrees in the US have played a significant role in advancing professional practice in various fields. Originating from the need for advanced training and specialization, these degrees have expanded and diversified over time, meeting the demands of professionals seeking advanced knowledge and skills in their respective disciplines (Perry, 2013). An initiative to redesign and improve professional doctoral degrees began in 2007 with the creation of the Carnegie Project on the Education Doctorate (CPED) (2009). Since then, professional doctoral degrees have grown tremendously.

Online doctoral programs are an alternative pathway for individuals seeking advanced degrees. Prior research on doctoral programs exists (e.g., Buss & Zambo, 2016; Zambo, 2011; Zambo et al., 2014), with fewer studies focusing on practitioner-oriented dissertations (e.g., Belzer & Ryan, 2013; Chan et al., 2013; Dawson & Kumar, 2014, 2016). Our online EdD program in Learning Design and Technologies (LDT) was established in 2016 at the University of South Carolina. The program curriculum was designed to prepare scholarly practitioners to apply principles of instructional systems design, integrate educational technologies into teaching and learning, create theoretically sound interventions to address problems of practice within their professional contexts, and investigate the impact of those interventions (Ari et al., 2022; Arslan-Ari et al., 2020). This is an asynchronous online program that features extensive use of online discussions among students, a large amount of online learning materials, group projects, reflection assignments, accessible online videos and recorded lectures, and numerous opportunities for peer feedback and chair mentorship on dissertation sections that are embedded into our courses. A detailed description of how theory and professional practices informed the design of our online courses is available in Grant (2021).

As part of our ongoing program evaluation, we have not conducted a comprehensive and systematic review of dissertation research within our LDT program since its inception. This study follows the call from Kumar et al. (2022) "to clearly distinguish how such research is fulfilling the purpose of the education doctorate, an online doctoral program's mission and goals, and the needs of the professionals enrolled in EdD programs" (p. 727) and Priest's (2001) goals of accountability and improvement for program evaluation. The purpose of this study was to understand how and in what ways theory, research design, and methodology were applied in our students' reports of research. Holistically, we were interested in how our students applied our curriculum to their research in an outcome model evaluation (Priest, 2001). Within a pragmatic evaluation

paradigm (Reeves & Hedberg, 2003), the present study aimed to review our student graduates' dissertations. We were guided by the following question: What are theoretical and methodological trends and patterns in dissertations completed in an online EdD program at the University of South Carolina? This analysis was important to identify areas for improvement and insights into the program's curriculum, to inform the creation of strategies for continued support to our students during the dissertation writing process, and to share our successes and challenges with other CPED-affiliated online doctoral programs.

Previously reported analyses of education doctorate dissertations have been conducted through content analyses (Archer & Hsiao, 2023; Dawson & Kumar, 2014; Durak et al., 2016; Kumar et al., 2022; Nelson & Coorough, 1994; Walker & Haley-Mize, 2012; Walser & Trevisan, 2015; Zambo, 2014) and document analyses (Gilliham et al., 2019; Kozikoğlu & Senemoğlu, 2016; Ma et al., 2018). These analyses have been reported from programs that address special education (Walker & Haley-Mize, 2012), curriculum and instruction and teacher education (Kozikoğlu & Senemoğlu, 2016; Ma et al., 2018), educational leaders (Archer & Hsiao, 2023; Gilliham et al., 2019; Zambo, 2014), and educational technology (Arslan-Ari et al., 2018; Dawson & Kumar, 2014; Kumar et al., 2022). The contexts in EdD dissertation research have predominantly consisted of K-12 settings (Dawson & Kumar, 2014; Durak et al., 2016; Gilliham et al., 2019; Kumar et al., 2022) followed by postsecondary settings (Dawson & Kumar, 2014; Gilliham et al., 2019; Kumar et al., 2022). Dissertations have also engaged adult participants (Nelson & Coorough, 1994) as educators through professional development and teacher induction programs (Ma et al., 2018), as well as K-12 students or groups (Ari et al., 2022; Ma et al., 2018).

Historically, Nelson and Coorough (1994) reported only a small number of EdD dissertations employed qualitative designs. However, more recently, qualitative and mixed methods designs have become common (Gilliham et al., 2019; Kozikoğlu & Senemoğlu, 2016; Kumar et al., 2022; Walker & Haley-Mize, 2012). EdD dissertations have relied on descriptive methods (Dawson & Kumar, 2014; Kozikoğlu & Senemoğlu, 2016; Nelson & Coorough, 1994) and evaluative purposes (Belzer & Ryan, 2013; Dawson & Kumar, 2014), and dissertation studies were more likely to report descriptive statistics (Durak et al., 2016; Walker & Haley-Mize, 2012). The use of surveys (Kozikoğlu & Senemoğlu, 2016; Nelson & Coorough, 1994; Walser & Trevisan, 2015) and interviews (Durak et al., 2016; Walser & Trevisan, 2015) to report participants' perceptions (Kozikoğlu & Senemoğlu, 2016) have been common data collection methods.

The uses of theory in EdD dissertations, however, have been analyzed and reported less. In addition, Zambo (2014) asserted that the uses of theory in EdD dissertations have been unclear, while more recently, Kumar et al. (2022) reported that theory in their educational technology students' dissertations was often used to conceptually frame a study and support the design of study interventions. Theories of learning, such as constructivism and andragogy (Durak et al., 2016; Kumar et al., 2022; Zambo, 2014), motivation (Kumar et al., 2022; Zambo, 2014), technology integration, use, and adoption (Kumar et al., 2022), and distance education (Kumar et al., 2022) have been reported.

RELATED LITERATURE

Online Doctoral Programs

Online doctoral programs have garnered heightened interest and acceptance because they offer professional students flexibility, access, cost-effectiveness, and technology-based interactions. Students can examine course materials and participate in learning activities flexibly (Akojie et al., 2019; Bolliger & Halupa, 2012) while being able to balance professional and personal responsibilities (Lee et al., 2020; Studebaker & Curtis, 2021). In terms of access, online doctoral programs remove geographic constraints as a limiting factor as students can participate from anywhere without the need for relocation (Henrikson et al., 2014; Scarpena, 2016). This opens doors for those who are limited by geographic distance or other mobility constraints. Further, online doctoral programs are cost-effective given that expenses related to tuition fees, commuting, housing, and textbooks are minimized. The cost-effectiveness allows a broader range of socioeconomically diverse populations to pursue quality graduate education (Montelongo, 2019). In terms of technology-based interactions, the use of robust learning management systems, multimedia resources, and interactive tools such as video conferencing plays a crucial role in facilitating communication and promoting a sense of community in online learning contexts (Akojie et al., 2019; Bender et al., 2018; Byrnes et al., 2019; Kumar et al., 2023).

Dissertations in Practice

According to CPED, a Dissertation in Practice (DiP) is a doctoral research project that emphasizes the practical application of scholarly knowledge to real-world problems (Buss & Zambo, 2016; Zambo et al., 2014). The DiP is an alternative to the traditional PhD dissertation that primarily focuses on the generation of new disciplinary knowledge through original scientific research. A DiP foregrounds the practice of practitioners and does not "develop theory or fill gaps" (Perry et al., 2020, p. 40) in disciplinary knowledge. Instead, the DiP focuses on the practical application of theoretical and scholarly knowledge to address problems of practice that significantly affect one's professional setting. A problem of practice is a complex issue that a practitioner encounters in their field (Belzer & Ryan, 2013; Ma et al., 2018), and that problem drives the design, implementation, and investigation of potential solutions that are reported. Differently from PhD dissertations that often aim to create generalizable scientific knowledge, outcomes of DiP research are highly contextual and situated within one's professional setting (Hochbein & Perry 2013; Ma et al., 2018).

The emphasis on addressing a practical issue does not mean a DiP lacks theoretical foundations. In fact, the process of designing a DiP is characterized by a close relationship between "scholarly expertise and implementation of practice" (Zambo et al., 2014, p. 127). Specifically, problems of practice are theoretically framed, justified, and contextualized within the extant body of literature. A comprehensive review of relevant theories, conceptual frameworks, and empirical studies informs the decision-making process for proposing systematic actions to address the problem of practice (Arslan-Ari et al., 2020). After establishing the theoretical background to support the DiP, a well-planned combination of scientific research methods that is suitable to investigate the problem within the professional setting is chosen to operationalize the investigation of whether the chosen actions have an impact on the problem of practice (Buss, 2018; Mertler, 2017).

EdD students in our program identify problems of practice within their professional contexts during the first year (Arslan-Ari et al., 2020). Students often join the program with a general idea about a target problem of practice. Given the focus of our program on technology-enhanced teaching and learning, students are expected to shape their problem of practice around the premise that learning technologies can serve as an agent of change (see e.g., Lowenstein & Barbee, 1990; Rogers, 1995). After receiving guidance from our faculty during core courses on action research, students often change or adjust their topic, refine the scope of their problem, choose a different set of participants, or decide on new approaches to address their problems of practice. In the second and third year, students take core courses that facilitate a comprehensive review of theoretical perspectives to support their work. They are prompted to select one or more theories and/or instructional design models to guide the design of their intervention and the inquiry process to analyze its outcomes. Further, students take qualitative and quantitative research methods that help them propose a systematic inquiry approach to understand the complexities of the problem or evaluate the effects of their designed innovations to address the problem. Throughout the program, students write pieces of their dissertation chapters that are embedded into our coursework (Perry et al., 2020) and follow a structure informed by Buss and Zambo (2016). Lastly, results of DiP research inform evidence-based recommendations to improve technology-enhanced teaching and learning practices within students' professional settings.

Action Research

Action research is a method in which educators aim to enhance the practice of teaching and learning and nurture continuous improvement by actively involving stakeholders in systematic inquiry (Buss, 2018; Mertler, 2017). The concept of action research originated from Kurt Lewin's belief about bridging the gap between theory and practice (Johnson & Christensen, 2017). Different from traditional research methods, which focus on producing generalizable knowledge, action research prioritizes the application of knowledge to make an impact within the researchers' local context (Mills, 2018).

In educational settings, action research draws on a systematic and reflective process in which educators (e.g., teachers, school administrators) identify a practical problem, collect and analyze data, and thereby, make data-informed action plans to solve the problem (Buss & Zambo, 2016). Particularly, reflection is crucial for action researchers to identify avenues for potential improvement in their profession and initiate subsequent cycles of action research to foster ongoing enhancement (Mertler, 2017; Mills, 2018). Another notable aspect is reciprocity, whereby educators acting as action researchers gain valuable insights from this experience and enhance their professional practice while simultaneously yielding a positive change to their own contexts (McNiff & Whitehead, 2002; Mertler, 2017).

To date, action research has been widely adopted in online and on-ground EdD programs as a signature pedagogy and research methodology (Foster et al., 2023; Vaughan & Burnaford, 2015). In many EdD programs, action research requires access to a professional setting, allowing practitioners to systematically investigate a problem in their contexts (Buss, 2018; Firestone et al., 2021). In addition, action research offers flexibility to draw from a variety of philosophical paradigms, theoretical frameworks, and research methods from different disciplines (Buss & Zambo, 2016).

Philosophical Paradigms

Creswell (2014) argues that while the philosophical stances of researchers are often not evident, it is nonetheless valuable for researchers to explicate their philosophical viewpoints in research reports. A researcher's philosophical worldview influences the research design, data collection methods, and data analysis strategies (Kivunja & Kuyini, 2017). Therefore, as a part of acknowledging their subjectivities, student researchers in our program identify their research paradigms following Mertens's (2009) framework: postpositivist, interpretivist/constructivist, transformative, and pragmatic paradigms.

Each paradigm reflects basic philosophical beliefs, including axiology (the nature of ethical behaviors), ontology (the nature of reality), epistemology (the nature of knowledge), and methodology (the nature of inquiry) (Creswell, 2014; Mertens, 2009). Proponents of postpositivism ascribe to objectivity of knowledge and in research. The researcher and the researched are distanced from one another to observe change without influence (Shan, 2021). Researchers following an interpretivist or constructivist paradigm affirm their interactions with research participants and acknowledge reality is socially constructed by individuals (McChesney & Aldridge, 2019). Advocates using a transformative paradigm agree that interactions among researchers and research participants are known and reality is socially constructed by individuals but assert that knowledge is socially and historically positioned, where privilege within society and history have impacted power and relationships (Mertens, 2009). Finally, pragmatists seek a middle ground with postpositivism and interpretivism. For pragmatists, interactions among researchers and research participants are defined based on a specific study, and research methods are decided by a study's purposes and particular questions (Shan, 2021).

Because action researchers often seek to understand and change practices, the relationship among researchers and research participants is cooperative and complementary (Bargal, 2008; Mertens, 2009). These valuable relationships are most aligned with interpretivist, transformative, and pragmatic paradigms (Kivunja & Kuyini, 2017), and primarily, qualitative and mixed methods study designs are derived from these three paradigms (McChesney & Aldridge, 2019; Shan, 2021). Although some authors suggest postpositivism may support action research (cf. McCutcheon & Jung, 1990), the insider positionality and lack of objectivity in action research align poorly with the tenets of postpositivism.

Theoretical Framework

Connection between theory and practice is crucial for any research endeavor. From the conceptualization of DiP research to the discussion of its findings and implications, utilization of theories and theoretical frameworks is an integral part of the research process (Kumar & Antonenko, 2014; Kumar et al., 2022; Zambo, 2014). In general, these theories and theoretical frameworks fall under the big three theories of learning: behaviorism, cognitivism, and constructivism. For instance, a DiP in which the student designs a computer-based intervention adhering to the principles of dual coding theory and Gagné's nine events of instruction might fall under the umbrella of cognitivism (Arslan-Ari et al., 2020), whereas an implementation of game elements (e.g., badges, rewards) to improve young students' engagement in the classroom may be considered behaviorist.

Because a DiP study focuses on addressing a problem in one's professional practice, it is contextualized and often multidisciplinary (Gillham et al., 2019; Kumar & Antonenko, 2014). Hence, during the conceptualization of a DiP, allowing freedom to explore the theoretical frameworks that are related to one's research problem and that resonate with their research interests, values, and epistemological orientations is important for a meaningful and authentic action research experience (Zambo, 2014). However, mentoring and scaffolding (e.g., by dissertation chairs and committees) are needed because choosing theoretical frameworks requires combining information from multiple disciplines, which is challenging for students (Kumar & Antonenko, 2014; Zambo, 2014). But, the other side of the coin is that this freedom is also challenging for dissertation chairs as students' work may not align with the chairs' research expertise (Kumar et al., 2022).

Type of Study

Acceptable forms of action research include descriptive or intervention studies for identifying and addressing problems of practice (Arslan-Ari et al., 2020; Belzer & Ryan, 2013). But in fact, most EdD students choose to conduct intervention studies that evaluate innovations that are either already in place or are designed by the students (Arslan-Ari et al., 2020; Dawson & Kumar, 2014). The choice between intervention and descriptive studies aligns with the purpose of research, research questions, feasibility, and ethical considerations. The research question mainly guides the selection of the study type. Belzer and Ryan (2013) identified three types of research questions in DiPs: (a) questions that evaluate existing policies or initiatives, (b) questions that evaluate the student-designed intervention to address a problem, and (c) questions that seek to describe the current conditions for generating contextualized solutions. The studies that are looking for the first two types of questions can be seen as generic intervention studies, asking "What happens when...?" (Belzer & Ryan, 2013, p. 203). In the intervention studies, the aim is to examine the impact of an intervention on particular variables in the student's specific research setting. The intervention studies require careful evidence-based planning of the intervention including its duration, implementation strategies, theoretical background, appropriate data sources for the evaluation, and intervention reporting. The outcomes of intervention studies inform practitioners on the effectiveness of the intervention to solve the problem of practice and guide decision-making (Kumar et al., 2022; Zambo, 2014).

The studies that seek the third type of question can be categorized as descriptive studies that pose the inquiry "What's going on here?" (Belzer & Ryan, 2013, p. 203). In descriptive studies, the students seek to describe the existing conditions to generate suitable solutions. A descriptive study requires careful selection of appropriate sampling techniques and sample size, and the selection or design of data collection instruments to ensure the study findings are representative of the target population and capture the necessary information about the situation (cf. Firestone et al., 2021). The outcomes of descriptive studies provide a comprehensive understanding of the situation to make recommendations for action (Arslan-Ari et al., 2018).

Research Contexts

Given the emphasis on solving practical problems embedded in one's professional setting, action researchers need to determine their positionality in the DiP. A researcher's positionality refers to the stance a researcher adopts in relation to the subject of their research to reflect their relationship to the research participants, their level of involvement, and the extent to which they have influence over the research process (e.g., Czerniawski, 2022). Herr and Anderson (2005) proposed a continuum to portray the different types of positionalities a researcher can adopt, which range from (a) insider, (b) insider in collaboration with other insiders, (c) insider in collaboration with outsiders, (d) reciprocal collaboration, (e) outsider in collaboration with insiders, and (f) outsider studies insiders.

Action researchers often take on the positionality of an insider (Herr & Anderson, 2005) because they are actively involved as a relevant stakeholder in the context of the problem being investigated (Mills, 2018). This positionality provides action researchers with an opportunity of contextualizing the problem and potential solutions to benefit stakeholders within their unique context. On the other hand, action research is well-suited for educational practitioners from a broad range of settings (e.g., K-12 schools, higher education, corporate and military training) and allows those practitioners to explore their own contexts and improve practices within their sphere of impact (Mertler, 2017).

Methodological Alignment

Once a student identifies a research context, research participants, the type of study, the philosophical paradigm, and the theoretical foundation(s), the student needs to operationalize the research inquiry in light of the affordances and constraints in their unique research setting. Particularly, our program faculty guides students on (a) identifying independent and dependent variables for their studies, (b) crafting and refining research questions and purpose statements that reflect their research goals, (c) adopting, modifying, or creating quantitative data sources based on validity and reliability measures, and (d) identifying or creating qualitative data sources. This process ultimately culminates in the creation of a research matrix that serves as a tool to assess the methodological alignment in their DiP. Further, students are expected to propose strategies for rigor and trustworthiness (Archer & Hsiao, 2023; Tracy, 2020).

While it may seem like it, conceptualizing and aligning the different DiP components is neither a linear nor a sequential process. Rather, the work is continuous and iterative. Students start brainstorming and writing about different pieces of their DiPs in the first year, and they gradually refine their research plans as they advance in the program. After being assigned a dissertation chair in the third year, students often need to significantly revamp their methodology. The chair holds weekly synchronous online meetings and provides one-on-one support to help students propose a well aligned methodology. Those meetings often include conversations in which the dissertation chair helps the student think about key research concepts that the student may not be very proficient in such as "statistical significance, effect size, and practical meaning of the results" (Hochbein & Perry, 2013, p. 186), among others. These meetings have been proven essential to help our students connect their theoretical understanding of research concepts to their application in the DiPs. Students in our program receive virtually the same guidance from all program faculty. Moreover, students have multiple opportunities to interact with committee members and receive additional guidance on their work.

METHODOLOGY

This study reviewed dissertations completed within the LDT concentration of our online asynchronous EdD program. Since the program's inception in Fall 2016, a total of 93 students from 10 cohorts successfully defended their dissertations and graduated. By the time data were analyzed in the summer of 2022, 15 of those dissertations had not been made publicly available in ProQuest, which was the online database used for this study. The final sample for this study consisted of 78 dissertations across nine cohorts.

The first and second authors retrieved dissertations online and collected information from the dissertation titles, abstracts, and chapters. Eleven classification criteria were adopted to assess trends and patterns across dissertations: 1) dissertation title, 2) purpose statement, 3) philosophical paradigm, 4) researcher's positionality, 5) theoretical background, 6) research context, 7) research participants, 8) type of study, 9) research design, 10) data sources, and 11) data analysis methods. The first and second authors reviewed the corpus of data and discussed the plans for systematically analyzing and visualizing the data from each classification criterion, which led to the design of an online form for data entry. The online form contained two open-ended questions, three multiple-choice questions, and six checkbox questions as presented in Table 1.

Table 1. Dissertation Classification Criteria

Criteria	Form Options
1. Dissertation title	Open-ended question
2. Purpose statement	Open-ended question
3. Philosophical paradigm	Constructivism/Interpretivism, Pragmatic, Transformative, Postpositivism, Not identified (from Mertens, 2009)
4. Researcher's positionality	Insider, Insider in collaboration with other insiders, Insider in collaboration with outsider(s), Reciprocal collaboration, Outsider in collaboration with insider(s), Outsider studies insider(s), Not identified (from Herr & Anderson, 2005)
5. Theoretical background	Adult learning theory/andragogy, constructivism, cognitivism, Cognitive Apprenticeship, Constructionism, Community of Inquiry Framework, Diffusion of Innovation, Flipped Classroom Model, Gamification, Motivation Theory, Project-based learning, SAMR, Self-regulated learning, Self-efficacy, Situated cognition, TAM, Theory of planned behavior, TPACK.
6. Research context	K-12 elementary school, K-12 middle/intermediate school, K-12 high school, Higher education four-year university, Higher education community college, GED program, Corporate setting, Military, Other.
7. Research participants	K-12 students, K-12 teachers, K-12 administrators, Higher education students, Higher education faculty, GED students, Other.
8. Type of study	Descriptive, Intervention (from Belzer & Ryan, 2013)
9. Research design	Qualitative case study, Qualitative descriptive study, Mixed methods study, Multi-method study
10. Data sources	Surveys/questionnaires, Assessment tests, Interview: individual, Interview: focus groups, Observations, Participant-created artifacts, Reflection journals, Field notes, Online discussion board posts, Online metrics, Exit slips, Video recording, Lesson plans, Other.
11. Data analysis methods	Qualitative deductive analysis, Qualitative inductive analysis, Thematic analysis, Descriptive statistics, Independent samples t-tests, Paired samples t-tests, Wilcoxon signed ranks tests, Chi square, Correlations, Error classification, Other.

Note. Items 3, 5, 6, 7, 10, and 11 were checkbox questions that allowed multiple selection on the form. Other items allowed only one choice.

The data set was exported into a spreadsheet. Quantitative data analysis to identify frequencies within each criterion was performed in Microsoft Excel. In parallel, deductive qualitative content analysis of open-ended questions was performed in Excel. Deductive content analysis entailed coding and quantifying every content word in the data set to identify trends and patterns (Drisko & Maschi, 2016; Prasad, 2008) across dissertation titles and purpose statements. Subsequently, the data set was uploaded to an online word cloud generator for data visualization. Word clouds use specific terms as tags to visually display the terms that appear most often in the dataset by correlating term frequency with font size and color saturation (Hearst et al., 2019; Heimerl et al., 2014). As such, the larger the words, the more frequently they appear in the data set. Word clouds offer an immediate visual impression of the relative importance or prevalence of certain terms. The word cloud generator we used was called WordCloud.pro. It automatically excluded common non-content words (e.g., the, for), numbers, and stemming. Once the word clouds were generated, the first author reviewed the data set once again, manually removed a few extra non-content words (e.g., the word based in community-based learning), and generated updated word clouds.

FINDINGS

Philosophical Paradigm

From the 78 dissertations analyzed and following Mertens' (2009) taxonomy, most EdD students adopted a pragmatic paradigm (n = 60) for their research. The second most adopted paradigm was constructivism (n = 12) followed by the transformative paradigm (n = 5). No dissertation adopted postpositivism. Only two students adopted more than one paradigm to guide their dissertation research, and both students chose constructivism and pragmatism. Two dissertations did not explicitly disclose a chosen paradigm.

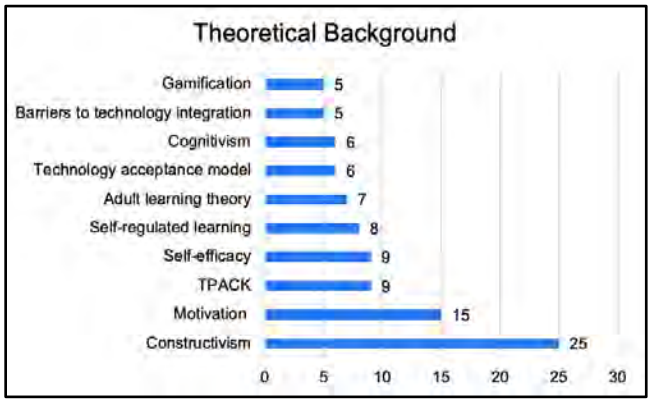
Researcher's Positionality

Using the continuum identified by Herr and Anderson (2005), the overwhelming majority of doctoral students identified their research positionalities as insiders (n = 53) or as insiders in collaboration with other insiders (n = 14). A few students identified themselves as outsider(s) in collaboration with insider(s) (n = 4) or as outsider(s) who aimed to study insider(s) (n = 4). Three students did not disclose their positionalities. No student identified themselves as an insider in collaboration with other outsiders or as members of a reciprocal collaboration.

Theoretical Background

A total of 69 different theories were adopted across all examined EdD dissertations in this study. The most used were constructivism (n = 25), motivation (n = 15), the technological pedagogical and content knowledge framework (TPACK) (n = 9), self-efficacy theory (n = 9), self-regulated learning (n = 8), adult learning theory (n = 7), technology acceptance model (n = 6), cognitivism (n = 6), barriers to technology integration (n = 5), and gamification (n = 5) as shown in Figure 1.

Figure 1. Theories Adopted in EdD Dissertations



Research Context

Most dissertation studies focused on teaching and learning contexts in K-12 schools (*n* = 57) compared to higher education institutions (*n* = 17), a GED program (*n* = 1), the military (*n* = 1), and a science center (*n* = 1). Within K-12 research contexts, most dissertation studies focused on high school grade levels (*n* = 28) followed by elementary grade levels (*n* = 19) and then middle school grade levels (*n* = 14). Within higher education, most dissertation studies were conducted at a four-year university (*n* = 13), while a few were conducted at a community college (*n* = 4).

Research Participants

The dissertation studies' participants were primarily students (*n* = 61) compared to teachers (*n* = 21) or administrators (*n* = 1). Within the studies with student participants, most were enrolled in K-12 schools (*n* = 44), and fewer were enrolled in higher education (*n* = 15), in a GED program (*n* = 1), or in the military (*n* = 1). Within the studies with teacher participants, most were employed in K-12 schools (*n* = 16) rather than higher education institutions (*n* = 5). One study was conducted with administrators from a high school. No study was conducted with higher education administrators or staff.

Type of Study

Using Belzer and Ryan's (2013) classifications, most dissertations reported an intervention-type study, or "What happens when...?" (p. 203) study, that involved technology integration in a teaching and learning context (*n* = 60). The remaining dissertations reported a descriptive study (*n* = 18), "What's going on here?" (p. 203) study, in which the researcher engaged participants to describe or understand the context, issues, and/or perceptions towards technology-enhanced teaching and learning without actually implementing an intervention.

Research Design

All but one dissertation study (*n* = 77) adopted a mixed methods research design that combined qualitative and quantitative data to investigate a problem of practice. One dissertation used a qualitative descriptive research design.

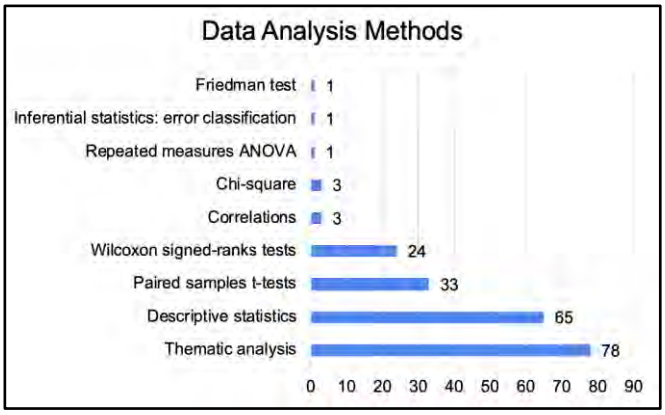
Data Sources

In the 78 dissertation studies, a total of 14 different data sources were adopted with all studies using more than one data source. The most commonly employed sources were surveys and questionnaires (*n* = 72), individual interviews (*n* = 51), assessment tests (e.g., multiple choice items) (*n* = 28), and focus group interviews (*n* = 22). Other less recurring data sources included the participants' reflection journals (*n* = 13), researcher's field notes (*n* = 11), performance assessments (e.g., rubrics) (*n* = 6), participant-created artifacts (*n* = 6), and online metrics (e.g., time logs) (*n* = 4). Data sources that were seldomly adopted included exit slips (*n* = 3), course grades (*n* = 2), lesson plans (*n* = 1), video recordings (*n* = 1), and documents (e.g., individualized education plans) (*n* = 1). The list of data sources is presented in Figure 2.

Data Analysis Methods

To analyze the 14 different data sources, nine different types of data analysis methods were used in the dissertations. The most commonly used data analysis methods were qualitative thematic analysis (*n* = 78) and descriptive statistics (*n* = 65). Within qualitative data analysis, most students adopted an inductive approach (*n* = 53) rather than a deductive approach (*n* = 4). Other quantitative data analysis methods included paired samples *t*-tests (*n* = 33) and Wilcoxon signed-ranks tests (*n* = 24) — both used for pretest-posttest analysis. Other less frequent quantitative analysis methods included Chi-square tests (*n* = 3), correlations (*n* = 3), repeated measures ANOVA (*n* = 1), error classification (*n* = 1), and a Friedman test (*n* = 1). The distribution of data analysis methods is shown in Figure 3.

Figure 3. Data Analysis Methods in EdD Dissertations



Dissertation Title

Analysis of dissertation titles revealed the presence of 440 different content words. The most recurring terms in study titles with at least 10 occurrences were *students* (*n* = 60), *research* (*n* = 40), *action* (*n* = 38), *school* (*n* = 31), *learning* (*n* = 28), *study* (*n* = 28), *technology* (*n* = 18), *high* (*n* = 17), *teachers* (*n*= 14), *writing* (*n* = 13), *development* (*n* = 12), *integration* (*n* =12), *online* (*n* = 12), *skills* (*n* = 12), *using* (*n* = 12), *perceptions* (*n* = 11), *classroom* (*n* = 10), and *motivation* (*n* = 10). Figure 4 visually depicts the weight of specific terms in dissertation titles in a word cloud.

Figure 4. Terms in EdD Dissertation Titles

Purpose Statements

Analysis of dissertation purpose statements revealed the presence of 586 different content words. The most recurring terms with at least 10 occurrences were *research* (*n* = 74), *purpose* (*n* = 72), *action* (*n* = 66), *students* (*n* = 62), *school* (*n* = 40), *evaluate* (*n* = 39), *technology* (*n* = 27), *impact* (*n* = 26), *study* (*n* = 24), *learning* (*n* = 21), *high* (*n* = 20), *teachers* (*n* = 20), *online* (*n* = 16), *classroom* (*n* = 15), *perceptions* (*n* = 14), *use* (*n* = 13), *course* (*n* = 12), *describe* (*n* = 12), *development* (*n* = 12), *integration* (*n* = 12), *determine* (*n* = 11), *writing* (*n* = 11), *grade* (*n* = 10), *motivation*, (*n* = 10), *science* (*n* = 10), and *skills* (*n* = 10). Figure 5 visually depicts the weight of specific terms in dissertation purpose statements in a word cloud.

DISCUSSION

This study reviewed DiPs from an online asynchronous EdD program in Learning Design and Technologies. Findings revealed that most students adopted pragmatism as the philosophical paradigm to guide their work as scholarly practitioners. Pragmatists reject the notion that it is possible to access the truth about a target phenomenon using only one scientific method (Mertens, 2009; Shan, 2021). Rather, pragmatists seek freedom to study a phenomenon in different ways, using a mix of methods that are deemed appropriate for a given situation (Johnson & Onwuegbuzie, 2004; Shan, 2021). Aligned with the pragmatic paradigm was the research design reported in most DiPs, which predominantly used mixed methods – a combination of qualitative and quantitative data sources to generate a comprehensive understanding (Greene, 2008; Ivankova et al., 2018) of a target phenomenon. These findings corroborate previous analyses of EdD dissertations (Gilliham et al., 2019; Kozikoğlu & Senemoğlu, 2016; Kumar et al., 2022; Walker & Haley-Mize, 2012), where mixed methods have become common. The autonomy, flexibility, and freedom that pragmatism offers for the design of research studies that fit one's own research goals and setting (Kivunja & Kuyini, 2017; Shan, 2017) is attractive to our students, as each of them has unique needs and constraints that must be considered for their action research.

Regarding the researcher's positionality, most students identified as insiders or as insiders in collaboration with other insiders. By definition, insiders seek "to study the outcomes of a program or actions in their own setting" (Herr & Andersen, 2005, p. 33). We argue that these two types of positionalities were prevalent in DiPs due to the focus of our program on action research as a signature pedagogy (Buss, 2018; Zambo, 2011), and the requirement for our students to conduct research within their professional setting and scope of influence (Arslan-Ari et al., 2018). These findings align with previous reports of practitioner programs when privileging action research (Foster et al., 2023; Vaughan & Burnaford, 2015). Consequently, very few students positioned themselves as outsiders who studied or who collaborated with insiders. Adopting an outsider positionality may be necessary in a few cases, for example, if career changes during the course of the program affect one's access to the research setting (cf. Czerniawski, 2022). A school teacher who takes on a new district-level position might need to update several components of their DiP, including their positionality. They might be able to conduct action research in the school if the principal agrees to support their work although their positionality probably needs to change from insider to outsider.

Figure 5. Terms in EdD Dissertation Purpose Statements

In terms of research context and participants, most studies were conducted with students or teachers from K-12 schools, especially in high schools. Fewer studies focused on students or teachers from higher education institutions. These findings replicate those of Dawson and Kumar (2014), who reviewed DiP dissertations from another EdD program in educational technology and found that most dissertations focused on K-12 learning contexts, as well as Durak et al. (2016) and Gilliham et al. (2019). Further, these findings suggest that most of our doctoral students work in K-12 school systems (e.g., teachers, administrators, librarians, technology integration specialists). Thus, their professional settings determine the scope of their problems of practice (Mills, 2018) and the eligible research participants.

Regarding the type of study, it was noticeable that most DiPs reported intervention-type studies seeking to investigate the outcomes of a technology-enhanced solution to a problem of practice. An expectation of DiP research is that findings will have implications for the doctoral student's professional practice but also generate benefits for the research participants (Belzer & Ryan, 2013; Buss 2018). The types of interventions varied significantly from using flipped learning, gamified modules, educational robots, virtual field trips, and several other approaches that involve technology integration into teaching and learning. Alternatively, a much smaller number of DiPs reported a descriptive study that attempted "to describe current conditions as a way to generate appropriate and contextualized solutions to problems" (Belzer & Ryan, 2013, p. 203). These descriptive studies often focused on perceptions, attitudes, acceptance, or motivations toward some form of technology integration in the classroom or technology-enhanced professional development.

DiPs featured a variety of theoretical frameworks, and the most recurring ones were constructivism, motivation theories, the technological, pedagogical, and content knowledge framework (TPACK), self-efficacy, and self-regulated learning. These findings somewhat overlap with others (Kumar et al., 2022; Zambo, 2014) who also reported dissertation research employing theories of learning and motivation. Our students have freedom to explore the literature related to their problems of practice. Embedded in a few of our courses is an annotated bibliography assignment, which prompts students to synthesize the literature and explore potential theories and methods to support their emerging research plans. Most importantly, our program faculty members continuously guide students to connect theoretical principles with practical applications (cf. Kumar & Antonenko, 2014; Kumar et al., 2022; Zambo, 2014). Our goal is to help students create an interwoven theory-practice relationship to guide the action research intervention design (if applicable) (e.g., Kumar et al., 2022) and the methods of inquiry into the intervention outcomes (Arslan-Ari et al., 2020). For instance, if a student wants to adopt Keller's (1987) Attention, Relevance, Confidence, and Satisfaction (ARCS) model to measure the impact of flipped learning on students' motivation towards learning algebra, then our faculty will help the student operationalize concrete strategies to address the four model components in their intervention and identify or create data collection instruments that address all model components.

Surveys/questionnaires and assessment tests were the prevalent quantitative data sources, while individual participant interviews, focus group interviews, reflection journals, and field notes were the prevalent qualitative data sources. In the context of action research, students used surveys to efficiently assess participants' beliefs, perceptions, and frequency of activities, and then invited a subsample of participants to provide more detailed explanations through individual and focus group interviews. Previous analyses have also reported the use of surveys (Kozikoğlu & Senemoğlu, 2016; Nelson & Coorough, 1994; Walser & Trevisan, 2015) and interviews (Durak et al., 2016; Walser & Trevisan, 2015) to report participants' perceptions (Kozikoğlu & Senemoğlu, 2016). In this study, qualitative data were often used to explain and further elaborate on quantitative findings (Creswell, 2014; Mertler, 2017). The choice to include surveys and interviews is not only a reflection of students' pragmatic paradigm and mixed methods design but also of the experiences they have in our program curriculum. Our research methods courses offer opportunities to collect and analyze survey data, interview transcripts, and observational data. Perhaps students felt more competent and confident in adopting these data sources in their DiPs.

Descriptive statistics and basic inferential statistics were the most commonly adopted methods to quantitatively analyze survey and assessment data. Previous studies of EdD dissertations have also reported that descriptive statistics are more likely to be used (Durak et al., 2016; Walker & Haley-Mize, 2012). To assess statistical significance in intervention outcomes, data sources were often administered before and after the action research intervention (i.e., a pretest-posttest design), which prompted participants to use paired samples *t*-tests and/or the nonparametric equivalent Wilcoxon signed-rank tests depending on the normality of data in specific subscales (Nolan & Heinzen, 2012; Wilcoxon, 1945). Thematic analysis was the common qualitative data analysis method. Most students used a bottom-up approach by creating a coding scheme from interview transcripts to identify trends and patterns in the data, and then identified important experiences and perceptions across participants in the format of qualitative themes (Creswell & Creswell, 2018; Saldaña, 2016).

A substantial overlap was found in key terms used in the DiP titles and purpose statements. The most recurrent terms in both data sources were students, research, action, school, learning, technology, online, and integration as shown in frequencies and as visually depicted in the word clouds. Newman and Covrig (2013) assert that a dissertation title "conceptualizes and names the key unique components of the research plan, its data, and findings" and often identifies the "Who, What, When, Where .. [and] How" of a study (p. 72). Therefore, the key terms identified here synthesize the essence of DiP research in our program: action research studies reporting the impact of technology integration on K-12 students' learning.

IMPLICATIONS FOR OUR EDUCATIONAL DOCTORATE CURRICULUM

Findings from this study revealed that DiPs from our program generally disclosed a pragmatic philosophical paradigm, adopted an insider's positionality, used a wide range of theoretical frameworks, adopted a mixed methods research design, reported an intervention study conducted with populations from K-12 schools, used surveys and interviews as data sources, performed descriptive and inferential statistics for quantitative analysis, and conducted inductive thematic qualitative analysis. In light of these findings, a few implications for our program curriculum emerge:

- Our introduction to action research courses should explain that it is possible to either choose one philosophical paradigm or combine aspects from multiple paradigms (see e.g., a dialectical stance in McChesney & Aldridge, 2019; Shan, 2021). Moreover, courses should clarify that students can pair the paradigm with different types of research designs for their DiPs. Our students may feel forced to adopt the pragmatic paradigm if they wish to employ a mixed methods design or vice-versa (McChesney & Aldridge, 2019; Shan, 2021). Featuring examples of journal articles or dissertations that combine different paradigms and research designs might lead to more variation in DiPs; however, these may be difficult to employ in our students' applied settings.
- The literature review course can emphasize to students the much needed alignment between the theoretical framework and other components of DiPs. As Zambo (2014) articulated, scholarly practitioners value and use theory in multiple ways. Particularly, students need support in understanding that a theoretical framework is the foundation for the design of a technology-enhanced intervention (cf. Kumar et al., 2022), for choosing research instruments that align with theoretical principles, and for interpreting study findings. The course should continue to offer freedom so students can select one or more theories and models that best fit their research goals. However, students should be prompted to think of the theoretical framework as an element that pervades all chapters of a DiP and to operationalize the application of theoretical principles and assumptions into their scholarly practice.
- The courses on advanced applied educational technology research can emphasize the difference between a mixed methods study and a multi-method study design (Anguera et al., 2018), which is a common issue in DiPs at the early writing stage. Students often hold the misconception that a mixed methods study is guided by research questions that are addressed separately with only qualitative and quantitative data. In this case, the dissertation chair needs to help the student revise their research matrix so that at least one of their research questions is approached with both qualitative and quantitative data (cf. McChesney & Aldridge, 2019). The course should also reiterate the need for alignment between multiple data sources (e.g., survey items, interview questions, observation logs) that target the same phenomenon from different perspectives to allow triangulation of findings (Archer & Hsiao, 2023). Ensuring alignment between instruments is another recurring challenge among students at the early stage of a DiP.
- Our dissertation preparation courses that coincide with students' data analysis and result write-up should emphasize strategies to address biases and subjectivities. As insiders in the research setting, students tend to be positively biased when reporting the

impact of their technology-enhanced interventions while overlooking negative outcomes or areas for improvement. Storey et al. (2015) reported that dissertations provided little evidence of impact on local practices, and Ma et al. (2018) recommended that EdD students' dissertations operationalize impact — both positive and negative. Our students need explicit guidance on keeping their biases and subjectivities in check to report not only the ways data sources converge towards positive outcomes, but also any negative outcomes of the study. Further, the dissertation preparation courses can guide students toward presenting results that are highly contextual in nature given the use of action research rather than look for commonalities and make generalizations to be extrapolated to various other educational settings using similar interventions (Belzer & Ryan, 2013; Zambo, 2011). Students should also present the discrepancies and exceptions emerging from data sets while providing rich contextual information that relates findings to the intervention design based on the literature.

- As corroborated in previous analyses (Durak et al., 2016; Kozikoğlu & Senemoğlu, 2016; Nelson & Coorough, 1994; Walser & Trevisan, 2015), surveys and interviews were common data sources in our students' dissertations. The research methods courses offered in the second and third year of our program could expose students to a wider range of data sources and offer additional opportunities to practice them firsthand. Currently, students practice with surveys, interviews, and observations. Perhaps encouraging students to explore different data sources (e.g., student reflections, implicit association tests, online metrics/analytics, video recordings) and to consider additional timepoints for data collection as opposed to before and after an intervention might lead to more diverse and robust methodologies.
- Like other analyses (Dawson & Kumar, 2014; Kozikoğlu & Senemoğlu, 2016; Nelson & Coorough, 1994), our students' DiPs tended to be more evaluative and descriptive. Research methods courses, however, could also offer opportunities for our students to practice more advanced data analysis methods beyond descriptive and basic inferential statistics of pre- and posttests and qualitative thematic analysis. Alternative options could be offered to include Chi-square tests, correlation analysis, discourse and/or conversation analysis of verbal interactions, and ethnomethodological analysis.

STUDY LIMITATIONS AND FUTURE RESEARCH

This study reviewed a substantial number of DiPs, but self-report data from students, such as end-of program survey responses and student interviews were not included in the analysis. Future research should include additional types of data that can provide a more comprehensive understanding of students' experiences designing a DiP (e.g., Amrein-Beardsley et al., 2012; Strom & Porfilio, 2019). The findings presented here represent one program's dissertation studies, so the results should not be generalized to other contexts, degrees, and programs. In addition, the methodological approaches and theoretical concepts reported are aligned to the LDT concentration of the EdD program at the University of South Carolina, so other programs' curricula may create different findings. Future research could increase the generalization of findings by aggregating an analysis of DiPs across online education doctoral programs in the US to generate insights at the national level.

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