Designing a Peer-Mentoring Program for Education Doctorate (EdD) Students: A Literature Review

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Abstract

Objectives: In preparation for creating a peer-mentoring program for education doctorate (EdD) students, we conducted a literature review to learn about the characteristics of peer-mentoring programs for graduate students and EdD students specifically.

Method: Our search criteria included articles about peer mentoring for graduate students only; published in peer-reviewed journals since the year 2000; and about programs that involved more experienced students, students farther along in the program, or recent graduates. These criteria resulted in 15 articles.

Results: We applied what we learned about program design and characteristics in the creation of a voluntary peer-mentoring program for first year students, including purposeful selection and assignment of mentors and mentees along with stated expectations for the type and frequency of mentor/mentee conversations.

Conclusions: More research is needed that addresses a consistent definition of peer mentoring, methodological concerns about research, challenges of these programs, and how certain aspects of peer-mentoring programs relate to program completion rates.

Implications for Theory and/or Practice: Continued investigation into the benefits and challenges of mentoring programs will inform our service to students. Investigation into multiple programs and peer mentoring in the later stages of the doctoral journey will strengthen the extant literature about peer mentoring for doctoral students.

Keywords: peer-mentoring programs; education doctorate students; academic support; psychosocial support

Introduction

The national attrition rates within education doctorate programs are high, with estimates ranging between 50% to 70% (Ivankova & Stick, 2007; Rockinson-Szapkiw, Spaulding, & Bade, 2014). Two challenges faced by many students who pursue the doctor of education (EdD), which likely contribute to the high attrition rate, are (a) balancing full time employment as education practitioners with school; and (b) overcoming a gap that often exists between curriculum and the identification of relevant, problem-based inquiry for practitioners (Kerrigan & Hayes, 2016). Scholars, as a result of their research, identify several recommendations that program faculty can implement to address these concerns. These include identifying and providing additional support for intrinsically motivated students who are “encouraged by the program quality” (Ivankova &

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Stick, 2007, p. 129)—particularly in online programs; offering courses in convenient and flexible formats for adult learners, such as online and evenings (Rockinson-Szapkiw et al., 2014); and designing coursework that "employ[s] context based practices and projects that allow for authentic participation" (Rockinson-Szapkiw et al., 2014, p. 303) and focuses on relevant research and inquiry skills (Kerrigan & Hayes, 2016). Program faculty are also encouraged to facilitate the development of community among doctoral students, ranging from informal and formal interactions (Ivankova & Stick, 2007) to the adoption of a cohort model (Rockinson-Szapkiw et al., 2014).

Many programs have addressed the aforementioned challenges by creating cohort models, which consist of students who proceed through the program together and form supportive, familial bonds for emotional support (Bista & Cox, 2014; McCarthy, Trenga, & Weiner, 2005; Seed, 2008; Seifert & Mandzuk, 2006). Additionally, programs are being developed that emphasize "practice over scholarship and school-based improvement over university teaching" (Bista & Cox, 2014, p. 2) while also requiring research-based inquiry and reflection (Wergin, 2011).

Purpose and Significance

An opportunity for increased support of EdD students is peer mentoring. We developed such a program at our mid-sized Midwestern university. The purpose of this article is to share our findings regarding the key structural components of peer-mentoring programs that provide support for doctoral students and how we applied them to the development of our program. Peer-mentoring programs in higher education are becoming more widespread, in part, to decrease attrition rates by offering academic and socio-emotional support to students (Erickson & Travick-Jackson, 2006; Holley & Caldwell, 2012; Shotton, Oosahwe, & Cintrón, 2007; Terrion & Philion, 2008). Much of the extant research about this topic stems from inquiries about mentoring for career development. For example, Kram & Isabella (1985) found that peer relationships offer alternatives to traditional formal mentoring models by "providing a range of developmental supports for personal and professional growth at each career stage" (p. 116). In the following section, we provide some context about the background of our program and the need for a peer-mentoring program.

Program Context

As program faculty (the first two authors) and a graduate assistant (the third author) within the Department of Educational Leadership at Ball State University, a medium-size, public Midwestern university that offers the education doctorate as a cohort model, we became interested in increasing retention and graduation completion rates in our program. This interest developed after having conversations with current students and recent graduates, and viewing program data that indicated the Year 3 attrition rate for doctoral students from 2011 to 2016 was approximately 56%.

Our EdD program is designed as a cohort model (for approximately 15 students) that begins each fall semester. Core educational-leadership coursework is delivered in a blended format of online learning and required face-to-face classes that meet for 2 1/2 hours once a month on a weekday afternoon. Students within a cohort take those core classes together. The typical student takes two courses that are scheduled to meet back-to-back on the same day once a month. Additional research and electives are offered online or face-to-face. Students are required to complete the traditional dissertation in order to obtain the EdD. Because our program is heavily oriented toward practitioners, program faculty created courses to further develop academic writing

and research skills, such as a course dedicated to writing literature reviews, and quantitative and qualitative methods courses designed specifically for our students to better prepare them to conduct and analyze research.

In light of the cohort model and coursework designed to develop academic skills required for the dissertation, we remained concerned about our attrition rate. Although 56% is on the lower end of the national average as cited in the introduction, we sought to strengthen our student retention to accurately reflect our department's belief that our goal is to support all accepted applicants through program completion. Based on the feedback of students and graduates, we embarked on a process to develop a research-based peer-mentoring program.

One aspect of this process was the synthesis of extant literature about doctoral peer-mentoring programs and graduate school programs more widely, as we sought answers to questions we asked while designing our program. Based on our review, we argue that, first, more research is needed regarding the design and benefits of key aspects of peer-mentoring programs for graduate students, doctoral students, and education doctoral students specifically. Second, the benefits of peer mentoring for education doctoral students are not very different from those identified for graduate students in other programs. This literature review is significant because faculty interested in creating their own programs may identify the most promising components to include in their programs. After an explanation of our research questions and method for review, we summarize our findings from a review of literature reviews, followed by a summary of our findings from empirical research. We conclude with a discussion of our application of these findings to the creation of our peer-mentoring program and our recommendations for future research.

The bulk of research regarding the nature, roles, and effectiveness of peer-mentoring programs in higher education includes programs for undergraduate students (Cutright & Evans, 2016; Douglass, Smith, & Smith, 2013; Goff, 2011; Heirdsfield, Walker, Walsh, & Wilss, 2008; Holt & Lopez, 2014; Jacobi, 1991; Rawlinson & Willimot, 2016; Ward, Thomas, & Disch, 2014); early and mid-career college faculty (Bottoms et al., 2013; Ferguson & Wheat, 2015; Harnish & Wild, 1993); historically underrepresented faculty in terms of race, culture, linguistics, and/or gender (Kalpazidou Schmidt & Faber, 2016; Murakami & Nuñez, 2014; Nuñez, Murakami, & Gonzalez, 2015; Packer-Williams & Evans, 2011; Rees & Shaw, 2014; Thomas, Bystydzienski, & Desai, 2015); students who are historically underrepresented, deemed nontraditional, or at-risk (Abegglen, Burns, & Sinfield, 2016; Adams & Hayes, 2011; Morales, Ambrose-Roman, & Perez-Maldonado, 2016; Rios-Ellis et al., 2015; Shotton et al., 2007); and computer-mediated mentoring for faculty and students in the online environment (Risquez & Sanchez-Garcia, 2012; Ruane & Lee, 2016; Smailes & Gannon-Leary, 2011; Smith-Jentsch, Scielzo, Yarbrough, & Rosopa, 2008; Vaill & Testori, 2012). There is less research about peer mentoring in graduate school programs or education doctorate programs, but some literature exists (e.g., see Grant-Vallone & Ensher, 2000; Holley & Caldwell, 2012). We discuss our research questions and methods in the next two sections.

Research Questions

To prepare for our peer-mentoring program, we undertook this review to investigate two questions:

1. What is known about the implementation and best practices for administering peer-mentoring programs in graduate school?
2. What is known about the implementation and best practices for administering peer-mentoring programs in education doctorate programs specifically?

Methods

We conducted our search of various terms and combinations of phrases using the Education Resources Information Center (ERIC) database. Our first search was the most tailored to our purposes. We searched the phrase “peer mentoring in doctoral programs,” which yielded one result. We widened our approach to include “peer mentor*” and “doctoral programs,” and “peer mentor*” and “graduate students”; and finally, “peer mentoring programs” and “higher education.” These searches yielded 134 articles. To be included in this review, articles needed to be

1. about graduate students only. For example, articles that investigated the relationship between graduate student mentors to undergraduates were not included;
2. published in peer-reviewed journals;
3. published since the year 2000; and
4. about peer-mentoring programs that involved more experienced students, students farther along in the program, or recent graduates.

A search based on these criteria resulted in 15 articles. Four of the articles were literature reviews, of which one (Yob & Crawford, 2012) focused solely on the mentoring of doctoral students, although not peer mentoring specifically. Five articles were about students in doctorate of education (EdD) or PhD in education programs. Four articles were about the graduate school experience in general (a combination of master’s and doctoral students). Finally, two articles were about doctoral degrees not specific to education (gerontology and doctoral students across campus). Of the 11 empirical studies, six were investigated with qualitative methods ranging from narrative inquiry, to autoethnography, to phenomenology; two were quantitative, based on online surveys; one was based on a survey that included short answer questions; and two were mixed methods based on surveys and other qualitative methods, such as focus groups. Four studies were conducted in international settings: two in Canada, one in Taiwan, and one in Australia. (See Table 1.)

Table 1. *Overview of Articles Used in Literature Review*

Author (Year) Country	Method	Sample	Overall Design of Peer-Mentoring Program	Findings
Booth, Merga, & Roni (2016) Australia	Autoethnography	PhD candidates in education & accounting programs (*n* = 3)	10 graduate students serve the university Dyadic appointments and group seminars	Peer mentors enhanced their own social skills, teaching, and reflective practice Also gained tertiary teaching and research experience
Erickson & Travick-Jackson (2006) USA	Analysis of a classroom assignment, focus group, and survey	Cohort of educ. leadership doctoral candidates (*n* = 14)	Third-year doctoral candidates take a leadership class and mentor first-year doctoral students	Mentoring was associated with leadership development, while issues involving communication, convenience, and establishing community across cohorts were challenges

Author (Year) Country	Method	Sample	Overall Design of Peer-Mentoring Program	Findings
Fleck & Mullins (2012) USA	Online program evaluation (survey & short answers)	Psychology graduate students (*n* = 39)	Pair incoming students with current students	Psychosocial assistance and networking were program strengths
Grant-Vallone & Ensher (2000) USA	Surveys of mentors and mentees	Psychology graduate students (*n* = 49: 29 mentors & 20 protégées)	Match first-year graduate students with more advanced students	Pairs who met more, often experienced more psychosocial and instrumental support and were more satisfied with their relationship Peer mentoring provided higher levels of psychosocial than instrumental support, but did not reduce stress
Holley & Caldwell (2012) USA	Qualitative case study Interviews, observations, and document analysis	Doctoral students across the institution (*n* = 10; 6 mentees, 2 faculty mentors, & 2 peer mentors)	Match students matched with a faculty mentor and a student peer mentor Students/mentors participate in group activities	The graduate program became more inclusive and community-based The most productive peer-mentoring relationships existed when the mentor and protégée were friends Academic and social networks were beneficial Participants shared academic and institutional information with other doctoral students
Lin (2014) Taiwan	Phenomenology	Science or engineering master's students (*n* = 16)	Advisor assigns peer mentor and mentee who are advised by the same advisor and work in the same lab team if not assigned can search for a peer mentor	Peer mentors created informal relationships not characterized by hierarchical differences as with the faculty advisor Relationship was helpful in instrumental, psychosocial support, and professional development Peer mentors should possess skills in interpersonal communication and leadership

Author (Year) Country	Method	Sample	Overall Design of Peer-Mentoring Program	Findings
Mullen & Tuten (2010) USA	Narrative case study Audio-recorded meetings	EdD and PhD in education students in Writer in Training (WIT) (*n* = 17)	Hybrid mentoring cohort model: informal and formal program Doctoral advisor facilitates individual and group doctoral student meetings	Peer mentoring encouraged interdependence, collaborative learning, increased technical writing and research skills, and cultural change
Noonan, Ballinger, & Black (2007) USA	3 focus groups: 1 each of protégés, peer mentors, and faculty mentors	Education doctorate mentoring-program participants (*n* = 16: 4 protégés, 4 peer mentors, and 8 faculty mentors)		Each group defined mentoring differently: protégés as assisting/guiding, peer mentors as a supportive relationship, faculty mentors as socializing and preparing protégés for future Outcomes included procedural and learning outcomes
Pidgeon, Archibald, & Hawkey (2014) Canada	6 graduate student focus groups or "culturally appropriate sharing circles" (p. 7), and an online survey	Culturally relevant peer and faculty mentoring initiative for Aboriginal graduate students (*n* = 60 graduate students for online survey & 35 graduate students and alumni for focus group)	Attend group meetings to discuss research, hear guest speakers, attend workshops, and conduct a closing circle	Relationships were evident in networking among Aboriginal students which instilled a sense of pride, camaraderie, and support Students were held accountable and encouraged to set and reach academic goals Logistics regarding requirements for attendance and planning for monthly meetings should be considered
Preston, Ogenchuk, & Nsiah (2014) Canada	Narrative inquiry Informal discussions and formal documentation of experiences	PhD students in College of Education Peer mentors (*n* = 3)	Students within a cohort agree to be mentored and mentor each other through orientations and regular social and academic meetings	Serving as peer mentors fostered transformational learning, and authors benefited from the support of their classmates Role of peer mentor and mentee was fluid within the cohort

Author (Year) Country	Method	Sample	Overall Design of Peer-Mentoring Program	Findings
Webb, Wangmo, Ewen, Teaster, & Hatch (2009) USA	Surveys	Faculty, students. and alumni in gerontology PhD program (*n* = 29; 9 graduates, 12 current students; 8 faculty)	Randomly pair students in the program more than 1 year with incoming students Help navigate campus and program, and advise on the program	General satisfaction with the peer-mentoring program but perceptions about benefits and the purpose of mentoring varied based on the type of participant Peer mentors were viewed as social support and advice-givers, while faculty were seen as responsible for direction and skill building

Note. Blank cells indicate no information provided in article.

Because we were interested in specific questions regarding the implementation of our mentoring program, we reviewed each of the 11 empirical research studies for content about the following five characteristics:

1. How initial contact is made and the frequency of meetings (six articles addressed both initial contact and frequency, one article addressed initial contact only, and one article addressed frequency only)
2. How mentors are selected and assigned to mentees (addressed in 10 articles)
3. At what point the peer-mentoring program begins in the mentee's program of study (addressed in seven articles);
4. Whether the peer-mentoring program is mandatory or voluntary (addressed in seven articles)
5. What the role of the peer mentor is in relationship to faculty advisors and/or the dissertation chair (addressed in eight articles).

We turn first to a discussion of the four literature reviews before providing an analysis of the remaining articles. Our focus during these reviews was to identify key characteristics of the design and evaluation of mentoring programs that scholars identified as important to consider for current practice and future research. As we were designing our program with no other template, we felt that these reviews would provide a basic structure and offer key considerations as a foundation. In the next section, we explain the common findings and recommendations discussed by the authors.

Literature Review

Four literature reviews were key to the development of our basic understanding of mentoring and peer mentoring (see Table 2). Aspects of mentoring programs that we considered in our analysis of the reviews included a definition of mentoring, which is largely inconsistent; benefits of mentoring to mentees and mentors; characteristics of mentors; and recommendations for future research (so that we might consider those issues while designing and evaluating our program). We were surprised that the authors addressed methodological concerns, but this concern became an important consideration for our purpose.

Table 2. *Overview of Literature Reviews Included*

Author (Year)	Sources	Focus	Findings
Budge (2006)	Not specified	Overview of research conducted to determine the effectiveness of different types of mentoring in higher education	Research lacked a consistent definition of peer mentoring, was largely methodologically unsound, and did not adequately explore dichotomous conceptualizations of peer-mentoring programs (e.g. formal/informal, and traditional/non-traditional types of mentoring)
Crisp & Cruz (2009)	Articles (1990–2007)	A reframing and updating of mentoring concepts developed by Jacobi (1991)	More attention to consistent definition and methodological concerns in empirical studies was needed
Terrion & Leonard (2007)	54 articles not specific to education No single case studies Mentoring could not be computer mediated	Characteristics of peer mentors	Found 5 prerequisite characteristics of peer mentors 2 characteristics related to career-related functions 8 characteristics related to psychosocial functions
Yob & Crawford (2012)	Articles written post-2005 Mentoring students in doctoral programs	Conceptual framework to guide research and practice for mentoring doctoral students created as a result of the literature review	Conceptual model of mentoring included 2 domains: academic and psychosocial, with 4 and 3 attributes respectively, in each domain

An inconsistent definition of mentoring. The authors of the literature reviews agree that there is no common understanding of the general concept or construct of *mentoring.* Crisp and Cruz (2009) identified over 50 definitions of the term, which they attributed to the wide range of disciplines and contexts in which mentoring is used. Definitions range from one person with superior ranking or more experience working with a less senior or experienced coworker, to two people of similar age and experience mentoring each other.

This lack of consistency in the definition of mentoring extends to the use of the term peer mentoring and is evident in how the different authors discuss it. For instance, Budge (2006) acknowledged that a range of different types of mentors and mentoring exists. However, while Terrion and Leonard (2007) acknowledged different types of mentoring, they ultimately espoused a definition of peer mentoring as a relationship in which “two individuals of similar age and/or experience come together” (p. 150). Budge (2006) recommended using a consistent definition of peer mentoring that could be applied to higher education and that also acknowledged the differences between formal mentoring (when a mentor is formally assigned to a mentee) and informal mentoring. Additionally, she asserted that distinctions should be made between

conceptualizations of traditional (an older person mentors a younger person) versus nontraditional mentoring (such as group mentoring among members within the same cohort). Yob and Crawford (2012) did not delve into various understandings of mentoring. Instead, they described it as the academic and professional guidance of individuals, and they wondered whether traditional modes of mentoring were applicable to the online environment.

Benefits of mentoring programs. Participating in mentoring programs benefits both mentees and mentors. Researchers describe benefits for mentees that include higher satisfaction, job socialization, and social networks (Budge, 2006; Terrion & Leonard, 2007). Specific to education, benefits include support and encouragement, increased self-esteem and confidence, and increased retention and graduation rates (Terrion & Leonard, 2007). Benefits for mentors include increased support networks, personal fulfillment (Budge, 2006), and enhanced interpersonal skills (Terrion & Leonard, 2007). Crisp & Cruz (2009) found nuances regarding the impact of mentoring, particularly when no operational definition of mentoring (for example, traditional or nontraditional forms of mentoring) is provided in the study.

Characteristics of mentors. Terrion and Leonard (2007) identified career-related and psychosocial characteristics of peer mentors that are beneficial for mentees. Career-related characteristics included program of study and sources of motivation. They identified eight psychosocial aspects of mentoring such as communication skills, empathy, and trustworthiness; and a third set of five "prerequisites for the student peer-mentor applicant" (p. 151) including ability and willingness to commit time, gender and race, and university experience. Yob and Crawford (2012) presented a framework for peer mentoring doctoral students that also consists of two domains of mentor characteristics: academic and psychosocial. Their framework is different from Terrion and Leonard's (2007) because it is not specifically for peer mentors and includes the relationship between faculty and students. Although Yob and Crawford (2012) identified fewer aspects (three for academic and four for psychosocial), their framework included many of the same characteristics as Terrion and Leonard (2007), such as academic competence, communication skills, and personal skills, such as trustworthiness. Identifying a reliable measure for each of the various characteristics of mentoring behaviors would contribute greatly to research in this area (Crisp & Cruz, 2009).

Recommendations for future research. Budge (2006) identified several problems in higher education peer-mentoring programs as topics for future research, including an examination of traditional mentoring roles that are based in male-dominant conceptions of leadership; more exploration of the role that gender plays in same- or cross-gender mentoring relationships; and the role of race in cross-racial or cross-cultural mentoring relationships. Crisp and Cruz (2009) noted conflicting research about whether cross-gender and cross-cultural mentoring is "detrimental or unhelpful" (p. 77). These assertions of conflicting evidence about the importance of matching along gender, race, or cultural lines were also mentioned by Terrion and Leonard (2007), but Yob and Crawford (2012) did not acknowledge these contradictions and asserted that current research "indicates that mentoring approaches need to be adjusted to take into account" (p. 44) the aforementioned differences.

Budge (2006) recommended that researchers ask critical questions about the extant research rather than rely unquestioningly on previous claims. She also warned against an uncritical reliance on research that draws from business, because she was not certain that it could be sufficiently generalized to a different context: "While connections between the organizational and educational research might help draw theoretical conclusions, the external validity in these articles becomes extremely weak due to the misapplication of research" (p. 81).

Concerns with research methods. Concerns with research methods were evident in the literature reviews. Budge (2006) pointed out that the reliability of mentoring research is problematic because often the tools for data collection, such as Likert scales and questionnaires, are not assessed for reliability, and the studies are not experimental. Most researchers also restrict their study to the examination of one program. Crisp and Cruz (2009) critiqued the methodology of extant qualitative research, stating: "… the majority of the reviewed qualitative studies could be considered methodologically flawed in that they provided a limited description of the methods used to collect and/or analyze the data" (p. 532). However, while Budge (2006) commented on the lack of empirical research on peer mentoring, citing only one article published at that time (Grant-Vallone & Ensher, 2000), it is promising to note that since 2006, there are 10 additional empirical studies published on the topic.

Another common point addressed in the literature was the need to measure the impact of the many variables of peer-mentoring programs and mentor characteristics, as well as pursuing continued research about the negative aspects of peer mentoring. Although no specifics are identified, Budge (2006) stated, "While mentoring is perceived as mainly advantageous, there may also be drawbacks to the experience" (p. 79). Although Budge (2006) did not develop what those drawbacks might be, her claims are an invitation for further exploration in this area.

Summary. The literature reviews highlighted key points about characteristics of and research about mentoring. In three of the four reviews, the authors discussed the need for a clear and consistent definition of mentoring to guide program development and research. The academic and social benefits of mentoring to both mentors and mentees and characteristics of mentors were highlighted. A surprising finding for us was the identification of several methodological concerns regarding mentoring. Continued research about mentoring in education programs that includes an operational definition of mentoring and addresses concerns raised about research and methods is warranted.

The literature reviews focused largely on general aspects of mentoring, rather than the specific design of such programs, and three of the four were not specific to graduate studies. Based on our criteria for article selection, only one study (Grant-Vallone & Ensher, 2000) was included in the four literature reviews (Budge, 2006). This is likely for three reasons. First, six of the articles we reviewed were published in 2012 or beyond, while the most recent literature review was published in 2012. Second, we only included articles since 2000. Third, we focused only on graduate school articles. Our next section includes what we found about the structural characteristics of peer-mentoring programs in the empirical studies.

Review of Empirical Studies

We reviewed 11 empirical studies to identify key characteristics of program design and structure that we needed to address in the creation of our program. Table 3 displays summary information about the characteristics we determined were relevant considerations in the development of a peer-mentoring program. We considered the characteristics related in studies that described the creation of mentoring programs and that included information regarding (a) how the initial contact between the mentor and mentee was made and how frequent they met; (b) the process for selection and assignment of mentors to mentees; (c) when the program began; (d) whether participation was voluntary or mandatory; and (e) the role of the mentor in relationship to program faculty.

Table 3. *Structure and Characteristics of Peer-Mentoring Programs*

Author (Year)	Initial contact and frequency of meetings	Selection and assignment of mentors	When the program begins	Voluntary or Mandatory	Role of mentor, vis-à-vis faculty advisor or dissertation chair
Booth, Merga, & Roni (2016)		Mentors selected for their ability to provide a diverse body of skills, knowledge, and expertise Had both 1:1 appointments with mentees and taught seminars			
Erickson & Travick-Jackson (2006)	Mentor contacts mentee as often as desired Some met 1-2 times, some only via e-mail, some not at all	Third-year doctoral students and mentees were assigned based on their expressions of interest	Fall semester for first-year doctoral students	Mandatory	Faculty initiated program and collected data but were otherwise uninvolved
Fleck & Mullins (2012)	Mentors and mentees were expected to contact one another Occasional events were held to encourage networking	Current grad students volunteered and were paired with mentees based on survey of personal characteristics	Beginning of first year of grad school for mentees	Voluntary	Faculty initiated and oversaw program
Grant-Vallone & Ensher (2000)	Both were responsible for maintaining contact, and setting up meetings Should meet at least twice per semester	First-year students matched with more advanced students	First year		Peer mentor provided emotional support and information
Holley & Caldwell (2012)	Mentors/mentees required to meet on regular basis Mentor/mentee events available	Mentors were volunteer students further along in grad program Mentees could request mentors of certain gender, race, discipline	Fall semester of master's program or first 2 years of doctoral program	Voluntary	Faculty advisor advised on more academic/career-related issues Peer mentor acted more informally as a friend
Lin (2014)	Mentoring relationships usually formed between students who already worked together closely	Mentors were usually assigned to mentees by advisor If mentee was not assigned to a mentor, they could seek out one informally		Mandatory	

Author (Year)	Initial contact and frequency of meetings	Selection and assignment of mentors	When the program begins	Voluntary or Mandatory	Role of mentor, vis-à-vis faculty advisor or dissertation chair
Mullen & Tuten (2010)	Mentor/mentees contacted and met each other within same cohort Met biweekly	Cohort members were both mentors and mentees for each other		Voluntary	Faculty and dissertation chairs taught and advised cohort Cohort members mentored one another Faculty also mentored students but on a more formal, structured basis
Noonan, Ballinger, & Black (2007)			First semester of PhD program		Faculty oversaw mentoring program and mentored on a more formal level than peer mentors
Pidgeon, Archibald, & Hawkey (2014)	Mentors/mentees met several times throughout the year, on weekends or evenings	Open to all graduate school indigenous students			Indigenous faculty members provide guidance and participate in meetings but graduate students lead
Preston, Ogenchuk, & Nsiah (2014)	Mentors/mentees met and maintained contact frequently as members of same cohort	Cohort members were both mentors and mentees for each other collectively	First semester of doctoral program	Voluntary	Professors and advisors played supportive leadership role Cohort members provided peer support
Webb, Wangmo, Ewen, Teaster, & Hatch (2009)		Mentors were students who had been in the doctoral program for at least 1 year Random assignment to mentees	First semester	Mandatory	Mentees were mentored by peer mentors, faculty mentors, and dissertation chairs, but faculty and dissertation mentors played a more formal role, while peer was informal

Note. Blank cells indicate no information provided in article.

Elements of peer-mentoring program design. There are two types of peer-mentoring programs addressed in the literature we reviewed. The first consisted of more-experienced students who mentored less-experienced students. For example, students at the University of Alabama who were further along in their program of study mentored students who were not as far along in the program (Holley & Caldwell, 2012). The other model consisted of students who mentored each other while at the same stage in the program, such as the Supporting Aboriginal Graduate Education (SAGE) program in British Columbia (Preston et al., 2014) and the Writers in Training program (Mullen & Tuten, 2010). The different answers to some of our questions are likely rooted in how the program creators conceptualized peer mentoring. Specific characteristics of peer-mentoring program design are described in the subsections below.

Contact initiation and the frequency of meetings. We wanted to understand the logistics of initial contact between mentors and mentees and what the typical time commitment might be. Six articles included information about initial contact. One program expected mentors

to contact mentees (Erickson & Travick-Jackson, 2006). Grant-Vallone and Ensher (2000), and Fleck and Mullins (2012), researched programs where the mentor and mentee were expected to contact each other. Neither article provided information about how or if that contact was facilitated. Lin (2014) researched a peer-mentoring program where contact between mentor and mentee seemed organic, in that the mentoring relationship grew from students having worked together previously. Students in the remaining two programs described were connected to one another because they were in the same cohort where the mentor/mentee relationship was fluid (Mullen & Tuten, 2010; Preston et al., 2014).

Seven articles mentioned frequency of meetings, and specificity of expectations for contact ranged greatly. In programs where students were both mentors and mentees within the same cohort, they met frequently because they saw each other for classes, as was explained in the program researched by Preston et al. (2014). Students in the SAGE program in Canada met several times throughout the year on weekends and evenings for their culturally responsive meetings (Pidgeon et al., 2014). Mullen and Tuten (2010) explained more specific requirements for the cohort they researched, as students were expected to meet biweekly.

The university-wide program at the University of Alabama required mentors/mentees to meet on a regular basis and held events to encourage connections (Holley & Caldwell, 2012). This was also the practice for the psychology peer-mentoring program researched by Fleck and Mullins (2012), although there was no mention of how often the mentors and mentees were required to meet. Grant-Vallone and Ensher (2000) explained that students in the psychology graduate program at a private university were required to meet at least twice a semester. Finally, while students in the doctoral cohort described by Erickson and Travick-Jackson (2006) were expected to meet as often as desired, participants reported that they met anywhere from one to two times via e-mail only, and some did not meet at all.

***Selection of mentors and assignment of mentors and mentees*.** Researchers in nine articles referenced criteria for how mentors were eligible to be part of the program, but only one included information about a selection process other than self-referral. In the analysis of their experiences as peer mentors, Booth et al. (2016) explained that mentors were selected based on their ability, knowledge, and skills to mentor one-on-one and teach seminars. Mentors volunteered in the programs described by Fleck & Mullins (2012) and Holley & Caldwell (2012). Some of the programs were mandatory. Mentors in those programs had to be third-year doctoral students (Erickson & Travick-Jackson, 2006) or were in the doctoral program for at least 1 year (Webb et al., 2009). In the mandatory science and engineering peer-mentoring program researched by Lin (2014), mentors became mentors of students who had the same advisor. In the same-cohort programs, the only criteria for being a mentor/mentee was to be a member of the cohort (Mullen & Tuten, 2010; Pidgeon et al., 2014; Preston et al., 2014).

Just as students in the three fluid peer-mentor/mentee programs were all mentors, they were also mentees. There was no specific assignment. Two programs were noted as assigning mentors and mentees based on self-reported interests (Erickson & Travick-Jackson, 2006) or a survey of personal characteristics (Fleck & Mullins, 2012). As stated above, the mentors in Lin's (2014) study were assigned based on similar faculty advisor. If the faculty advisor did not assign a mentee to a mentor, the student could seek one out. Gerontology doctoral students were randomly assigned to mentees (Webb et al., 2009), and mentees at the University of Alabama could request mentors based on certain characteristics, such as gender, race, or discipline (Holley & Caldwell, 2012).

When the program begins. We wondered if any programs may have started the mentoring program earlier or later in the program of study. We questioned if doctoral students might find the program more valuable as they transition away from core coursework and into the research, writing, and defense of the dissertation during the final years of their program. Seven studies referenced when the program began, and they all started during the first semester of coursework (see Table 3). This posed some interesting questions for us to consider as we pondered the development of our program.

Voluntary or mandatory. Researchers in 7 of the 11 empirical studies identified whether the peer-mentoring program was voluntary or mandatory. Three of the seven were identified as mandatory, while four were identified as voluntary. These distinctions by program are delineated in Table 3.

Role of mentor/advisor/dissertation chair. We felt it was important to consider how roles and responsibilities of the peer mentor were outlined in relation to the faculty advisor or dissertation chair, because we anticipated the need to be clear about boundaries between, or specific duties of, a peer and the formal advisor. Eight articles referenced a delineation of roles or explained the role of the peer mentor. Faculty initiated the doctoral cohort peer-mentoring program but were not otherwise involved (Erickson & Travick-Jackson, 2006). Fleck and Mullins (2012) also reported that faculty initiated and oversaw the peer-mentoring program, but no other information about faculty roles was provided. In the remaining articles, the role of faculty was generally described as being formal mentors and advisors, and peers provided informal, emotional support based on the peer relationships. We discuss our findings in relation to our research questions in the next section.

Discussion

We return to our research questions to summarize the meaning of our review of literature and our direction for establishing our peer-mentoring program. After summarizing what is known about peer-mentoring programs in graduate school and education doctoral programs based on our literature review, we explain how we developed the key aspects of such programs in our own context at our institution, including a finding that surprised us regarding when the program starts in comparison to our initial findings from students in their first year of the program. We end with recommendations for future research.

Question #1: What is known about the implementation and best practices for administering peer-mentoring programs in graduate school?

Despite the differences in the design and operation of the peer-mentoring programs, the findings were quite similar. Researchers concluded that having a mentor increased psychosocial support and advancement toward successful completion, and most commonly, the role of the peer mentor as an additional layer of emotional and social support for mentees was a benefit of the programs. This was notably true for students who are underrepresented in higher education or at a particular university (Pidgeon et al., 2014). Programs in which faculty provided oversight of some aspect/s of the design included formal events to facilitate the connection of mentors and mentees (Fleck & Mullins, 2012; Pidgeon et al., 2014).

Mentoring programs that seek mentors who display characteristics identified to best support mentees, such as empathy, communication, motivation, and encouragement (Noonan et al. 2007; Yob & Crawford), will likely yield higher satisfaction among mentees. However, more

research is needed regarding which aspects of program design should be leveraged to best support successful program completion.

Question #2: What is known about the implementation and best practices for administering peer-mentoring programs in education doctorate programs specifically?

Four empirical studies focused specifically on doctoral students in education (Erickson & Travick-Jackson, 2006; Mullen & Tuten, 2010; Noonan et al., 2007; Preston et al., 2014). A finding that surprised us was that all the peer-mentoring programs began during the students' first year. Given that doctoral students are accustomed to taking coursework already, it seems that a need for a mentor would arise as they transition away from coursework and into research and writing the dissertation. Yet, the themes that emerged from Noonan et al.'s (2007) study were not specific to the later stages of the dissertation. Those themes, which include relationship, motivation, professional socialization, instruction, opportunity, and procedures, are not specific to either the education doctorate or the later stages of doctoral studies. Although, it is possible that depending on how the doctorate program is designed, professional socialization and opportunity involving conference presentations and publications are part of the later stages of a program.

Yob and Crawford (2012) identified a strand of research about mentoring doctoral dissertations, but investigation into how peer mentoring might support dissertation completion is needed. More research is needed to determine what best practices are for education doctoral students specifically. The determination of best practices remains to be developed as more scholars contribute findings based on experimental research in the field. However, because there are many benefits from peer mentoring that appeared throughout the literature, we moved forward with our plans to design a research-based program for our students based on what is currently known.

Implications for the Design of Our Peer-Mentoring Program

Our literature review yielded implications for the design and implementation of a peer-mentoring program for first-year educational-leadership EdD students at our institution based on the characteristics of programs described and evaluated in the articles we reviewed. To begin this process, we reviewed aspects of peer mentors identified in the literature and created a set of characteristics to identify potential peer mentors. Then, we invited peer mentors to participate in the program. We also used those characteristics for matching mentors and mentees. Key elements of the first year of our peer-mentoring program, related to the characteristics we studied in our review of literature, are described below.

Program design. Like the programs described by Erickson and Travick-Jackson (2006), Grant-Vallone and Ensher (2000), and Holley and Caldwell (2012), our program focused on more-experienced students mentoring less-experienced students. Students who passed their dissertation proposal or are graduates of the EdD program served as mentors to the first-year EdD students (mentees). Although second-year students were assigned as mentors to first-year students in the study by Webb et al. (2009), we chose to include mentors who were beyond the second year, because second-year students were still taking coursework, similar to our first-year students.

Contact initiation and the frequency of meetings. As mentioned earlier, Erickson and Travick-Jackson (2006) tasked mentors to contact mentees. In the first year of our program, initial communication between each mentor and mentee was made by the mentor. After their first communication, each mentor and mentee pair was responsible for designing the meeting

schedule, location, and agenda. As with Holley and Caldwell (2012) and Fleck and Mullins (2012), regular meetings were expected in the first year of the peer-mentoring program. Since the mentors were either further along in the program or EdD graduates, we expected mentors to initiate and facilitate communication with their mentees a minimum of twice a month: once through a monthly mentoring conversation with their mentee via phone call, Web conference, or in-person, and once via an informal communication through text message, e-mail, or a short conversation. The first two authors (of this article) facilitated a social meeting of mentors and mentees (Fleck & Mullins, 2012; Holley & Caldwell, 2012; Pidgeon et al., 2014) toward the end of the first semester of the program, then transitioned to the expectation that mentors would initiate contact as described above.

Selection of mentors and assignment of mentors and mentees. Mentors were selected by faculty recommendations based on perceptions of the potential mentor's academic success during coursework and the dissertation process, and their interpersonal skills (Booth et al., 2016; Fleck & Mullins, 2012). Once selected, we contacted mentors via e-mail to request their participation in the program. All mentors and mentees completed a profile sheet. Like Erickson and Travick-Jackson (2006), we assigned mentors and mentees by self-reported interests, among other factors. We intentionally paired mentors with mentees based on their research interests, current profession, future goals, and geographic location during the first year of the peer-mentoring program. Finally, as with the program described by Holley & Caldwell (2012), students could request to be matched based on specific demographic or research interests.

When the program begins. We started the program during the fall semester of the first year of the EdD program. This decision was supported by our findings from the literature, as 7 of the 11 studies began mentoring programs during the first year of coursework (see Table 3).

In the first year of the program, we believed mentees might benefit from having a mentor paired with them throughout the entire doctoral program. However, we were surprised to find that mentee feedback after the first year indicated that one-to-one peer mentoring is helpful for students but not necessary. This could be because of our program design, which is heavily focused on practical coursework (such as facilities management) and leadership preparation, rather than research skills. There is also little, if any, apprenticeship as researchers. After careful analyses of data from the first year of the peer-mentoring program and additional literature reviews, we revised the peer-mentoring program the next year to provide first- and second-year mentees opportunities to attend informational seminars by mentors on topics related to academic success, work-life balance, and career paths, rather than having a one-to-one paired mentor. After mentees complete most of the required coursework during their first and second years in the EdD program, we may pair the mentees with mentors to complete the dissertation process.

Voluntary or mandatory. Four of the seven programs in studies that included information about this characteristic were voluntary (Fleck & Mullins, 2012; Holley & Caldwell, 2012; Mullen & Tuten, 2012; Preston et al., 2014). While this is only slightly over half, we chose to make our program voluntary because we did not include expectations for a mandatory peer-mentoring program in our graduate handbook. Therefore, we could not expect students to adhere to such a program requirement. Furthermore, we preferred for students to direct their own learning and take advantage of such opportunities only if they desired. We requested a 1-year commitment to the program from all participants. In two cases, mentors volunteered to work with two mentees, although mentors were only requested to guide one mentee.

Role of mentor/advisor/dissertation chair. Boundaries between the formal advisor and mentor were set at the beginning of the program for mentors, mentees, and the formal advisor.

Mentors facilitated conversations with mentees about topics such as coursework, work-life balance, writing time, research interests, and long- and short-term goal planning, which provided another avenue of connectedness to our university and department. The mentor referred mentees to their formal advisor for decisions about program coursework or completion. As faculty and a graduate assistant in the Department of Educational Leadership, we initiated the EdD peer-mentoring program and one social event, but limited our additional involvement in the program. This approach was evident in the programs studied in seven of the articles. Six studies described programs where faculty had a supporting role (Erickson & Travick-Jackson, 2006; Holley & Caldwell, 2012; Mullen & Tuten, 2010; Noonan et al., 2007; Preston et al., 2014; Webb et al., 2009). Finally, although indigenous faculty members participate in peer-mentoring meetings designed for indigenous students at universities in Canada, the graduate students have a leading role (Pidgeon et al., 2014).

Implications for Future Research

The benefits of peer mentoring have been well documented (Booth et al., 2016; Budge, 2006; Crisp & Cruz, 2009; Cutright & Evans, 2016; Lin, 2014; Noonan et al., 2007; Pidgeon et al., 2014). However, questions remain: Which type or design of peer-mentoring program will best support student retention and completion? Do programs in which experienced students mentor new students yield increased mentee/mentor satisfaction or success compared to programs where cohort peers mentor each other? We highlight the recommendation by Budge (2006) that identified the need for more research to test these assertions using experimental and control groups.

Although we identified four articles about peer mentoring for doctoral students in education, the programs researched focused on students' first years in the program (Erickson & Travick-Jackson, 2006; Mullen & Tuten, 2010; Noonan et al., 2007; Preston et al., 2014). Therefore, there is little research-based evidence about what aspects of peer mentoring are beneficial to students at the later stages of their program, such as comprehensive exams, the proposal, dissertation writing, and defense. Research is needed in these areas, as well as the aforementioned need for experimental design, to investigate the impact of certain aspects of peer-mentoring programs.

To construct better peer-mentoring programs, program developers need to know why students leave their doctoral programs. Are they leaving for lack of psychosocial or emotional support; challenges with balancing work, life, and school demands; a lack of academic support; or all three? Once program developers understand the answers to this question, they can more appropriately address students' needs. Further research is needed to identify what aspects of peer mentoring may contribute to retention in education doctorate programs, so that those attributes may be foundational to programs moving forward.

We are considering the benefits and challenges of creating a peer-mentoring program that has not been discussed in the reviewed literature: peer mentors who are graduates of the program. As this is an under-researched or possibly nonexistent form of doctoral mentoring, and is outside of the current definition of what peer means, there is much to be explored about the design and meaning of such a program, as well as the benefits to students pursuing the education doctorate. Because our doctoral program is a blended program that offers online and face-to-face learning opportunities, we are positioned to explore what mentoring in the online environment might look like and how it might benefit doctoral students' successful completion of our program.

In addition to creating a peer-mentoring program based on what is known about what works, we hope to consider innovative ways of providing peer mentoring during the later stages of the program, such as mentoring during the dissertation writing process, as recommended by Yob and Crawford (2012). Ultimately, we hope to use research-based practices we uncovered in this review to best support our students. We hope, also, to contribute to the increasingly robust field of research about peer mentoring of students who are pursuing the education doctorate as we further investigate and evaluate our own peer-mentoring program.

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