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Conducting literature review is a complicated, sometimes confusing and laborious process that beginning educational researchers, especially graduate students, often find challenging. However, in the past these challenges were hardly considered, but in more recent times they have been increasingly considered by various faculties and graduate schools due to the expanding needs from growing enrolments. To further develop and strengthen the responses to these identified needs, this article reviews literature concerning challenges faced by beginning educational researchers in conducting literature review, aiming to help unpack this complicated phenomenon by constructing a coherent story. Based on our review, we propose a framework to conceptualize four types of challenges. We term them LMCO (linguistic, methodological, conceptual, and ontological) challenges. Discussions centers on the four identified challenges, recommendations for future studies and implications to graduate preparatory programs.

Keywords: literature review; graduate education; research skill

Introduction

High quality educational studies, especially literature reviews, are instrumental in shaping educational policy, practice, further research, and even public perception (Lather 1999; Suri and Clarke 2009; Young 2001). Educational researchers' competency in conducting literature review determines the quality of reviews they undertake. However, competency does not come by easily. Given that modern day educational research celebrates diversity and complexity in objectives, methods, and perspectives (Suri and Clarke 2009), it is not always a smooth journey to interpret and synthesize relevant bodies of literature into a coherent story of the field centered around a research question. There are a number of scholarly (e.g., Boote and Beile 2005; Kwan 2008) works highlighting the issues and difficulties of conducting literature reviews. These efforts, however, remain sporadic. Therefore, there is a need to systematically synthesize the challenges facing beginning researchers in conducting literature reviews.

In this paper, we begin with a description of the review method employed in this literature review. Based on our analysis, we propose an LMCO framework (linguistic, methodological, conceptual, and ontological) to conceptualize challenges experienced by beginning researchers in conducting literature reviews. Finally, we discuss findings and

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their implications on graduate preparatory programs that will improve the literature review competency of a new generation of educational researchers.

Review method

In conducting this literature review, we adopt a qualitative review method to synthesize qualitative and quantitative studies (Suri and Clarke 2009; Bair 1999). Although the approach is mainly used for primary research studies, it could be used to synthesize secondary studies such as literature review papers and position or conceptual papers with strong theoretical underpinnings (Suri and Clarke 2009). The inclusion of both primary and secondary studies provides us a more holistic overview of the issue at hand.

In terms of scoping the study, we adopt an emergent, variable research design (Guba 1978). We took four strategies to delimit our scope. First, we explored the possibilities of varying words and terms relating to our topic on 'literature review' and 'challenges'. Second, we explored peer reviewed papers which studied challenges faced by beginning researchers while conducting literature reviews, particularly those faced by research students in the education arena. Third, we drew from ancestry and dependency (Cooper 1982) methods to track papers that cited or were cited by the studies we found. Fourth, we drew on papers studying issues relating to conduct of literature review in a broader horizon that may have bearings on the challenges in the conduct of literature review. For example, we also included papers studying challenges faced by graduate students when they work on their dissertations. We, however, only focus on findings related to challenges in conducting literature review. These papers cover education programs for research students, particularly doctoral students and their thesis writing.

Specifically, searching was conducted on major electronic databases used in educational research, including Academic Search Premiere, ERIC, Education Research complete, and PsycINFO. Keyword descriptors included conduct literature review, difficult*, challenge*, problem*, experience*, literature search, literature review, researcher*, meta-analysis, meta-ethnography, meta-synthesis, and research synthesis. Many iterations of search were conducted. Each iteration was carefully considered and recorded in terms of information pertaining to keywords, databases used, parameters defined, number of returns, and so on. Results of each iteration of search were closely examined to inform decisions on how to refine subsequent ones based on the criteria and the review scope mentioned above. Eventually, a total of 34 papers were included in our review.

The LMCO challenges

We employed a grounded approach to the analysis and synthesis. Based on the analysis, we formulated a new framework to conceptualize the various challenges facing beginning researchers in conducing literature review. Important ideas (usually the findings or the main arguments) related to challenges faced by beginning researchers were extracted from the collected papers. Keywords and concepts were highlighted in each of the idea. This is similar to that of an initial coding. This is followed by a focused coding where similar ideas were grouped into thematic categories. Finally the axial coding focused on adjusting the categories and explicating the relations among them.

Outcome of the analysis is a list of challenges, namely (1) linguistic, (2) methodological, (3) conceptual, and (4) ontological.

Linguistic challenges

Linguistic challenges include issues mainly related to the linguistic aspect of literature review. They are mostly literal (lexical and syntactical) difficulties, challenges in genre, and challenges in cultural discourse patterns. The majority of the studies reported challenges and difficulties from the perspectives of non-native speaker (NNS). Many of these NNS students see their difficulties mainly as literal, specifically regarding vocabulary, sentence patterns, and grammatical accuracy (Mohan and Lo 1985; Qian and Krugly-Smollska 2008). In addition, other syntactical issues such as connectors and transitional phrases have been identified (Mohan and Lo 1985; Qian and Krugly-Smollska 2008).

Studies (Bitchener and Busturkmen 2006; Cooley and Lewkowicz 1997; Franken 2012; Johns 1997; Kwan 2006; Qian and Krugly-Smollska 2008; Turner and Bitchener 2008) also found that beginning researchers displayed inadequacy in adopting appropriate literature review genre, such as styles of arguments and different rhetorical expressions required by different sections in a paper. For example, Turner and Bitchener (2008) found that 50% of the students in their study were particularly weak in writing the introduction of a literature review paper. Other studies also revealed that students were unaware of the expectation that the topic sentence introduces the main theme or topic of a paragraph (Kwan 2006). In addition, Turner and Bitchener (2008) also found that most (75%) of the students utilized weak logical progressions to organize the content of their arguments.

Some researchers suggested that challenges in linguistic expressions may stem from influences of an individual's native culture. Kaplan calls this form of challenges contrastive rhetoric (Kaplan 2001). He synthesized writings by East Asian students and commented that their problems with writing were less related to language or genre, than to culture. To avoid confusion with rhetoric styles in genre, we call this the cultural discourse pattern. For example, a holistic and analogical discourse pattern may be highly valued in Chinese literary works. This form of organizing thoughts and expression, however, is very different from the usual literature review style. As a result, researchers from the Chinese cultural background face challenges adapting to the linear and direct form of writing required in the English-language literature reviews (Kaplan 1972; Matalene 1985). Another example can be found in Matalene's (1985) study in academic writing. She attributed challenges faced by her students to influences from the Chinese culture. Students commented:

> My greatest difficulty is to keep direct connection to the topic. When I wrote indirectly about the topic, you would think it was out of order…. It seems that we need a conclusion in English, but we often leave it to let people think when we write in Chinese. (802)

Although attributing issues with linguistic expression to a person's culture provided a plausible perspective, these studies provoked a series of debates. For example, opposing scholars believe that attributing problems mainly to culture failed to consider individual differences and other influences (Das 1985; Liu 1996; Liu and You 2008; Mohan and Lo 1985). Das (1985) studied writings by bilingual undergraduates written both in English and their native tongue, and found that students' discourse patterns in English were equally deficient or strong as in their native language. It shows that cultural discourse patterns in a student's native culture may not be the only factor influencing the student's discourse organization strategy.

Methodological challenges

Methodological challenges include four different aspects: *scoping*, *analysis*, *synthesis*, and *discussion*. Specifically, challenges in scoping include difficulties in filtering high quality and relevant papers for review. Beginning researchers also face challenges in extracting key findings from each paper, synthesizing the extracted findings and providing recommendations for future research in the discussion.

In *scoping* a review, the reviewer needs to determine the extent of literature to be included. A scoping exercise commonly involves finding a collection of high quality, relevant papers. Studies have shown that beginning researchers find the scoping aspect difficult mainly because they feel unsure about what to collect and how to determine the quality of what they read. For example, they may overwhelm themselves by collecting all available literature on a specific topic without knowing how to be selective (Bruce 2001; Warburton and Macauley 2014; Wilhelm and Kaunelis 2005). This relates to technical capabilities in using web-based search tools or electronic databases – for instance, to scope their library search. Morrison and Kim (1998) found that students lack competency in selecting quality literature even though advances in technology brings about large amount of information through search capabilities afforded by technology. It seems that beginning researchers face challenges in defining a workable scope, collecting the needed papers and determining the quality of collected papers. Similarly, Ph.D. candidates in Warburton and Macauley's (2014) study also reported that they were overwhelmed by the massive amount of published literature and they for helps about the library search systems, selection of search terms and keywords; identification of key databases and design of a literature searching strategy.

Challenges in analysis refer to difficulties in deconstructing information from literature. A number of researchers found that beginning researchers do not possess sufficient competency in interpreting findings and key ideas from the literature. They may simply extract information from the discussion section of the source articles instead of providing their own interpretation of the various findings. On their own, they are not able to distill higher level meanings from the articles (Anisfeld 1987; Granello 2001).

Synthesis is the sorting and organizing of the extracted findings around themes or conceptual categories. It is commonly done after the students have analyzed and extracted key findings from collected articles. Beginning researchers are often found to lack competency in this particular area (Carson 2001; Froese, Gantz, and Henry 1998; Granello 2001; Holbrook 2007; Holbrook et al. 2004; Zhu 2004). Granello (2001) argued that due to a lack of ability to sort and organize findings, many students do not demonstrate the ability to connect information from different articles. Thus, each item is presented as a stand-alone piece of information. This observation is supported by Holbrook's (2007) study on examiners' comments on Ph.D. theses. She found that there are indeed a number of students who had not synthesized the literature they reviewed, even at the final thesis submission phase. An example of examiners' negative comment on syntheses was 'it is an undifferentiated list, "this person said this, this person said that" (1027). Similarly, Froese, Gantz, and Henry (1998) reported that students often 'summarise articles sequentially rather than comprehensively integrating the various findings.' (298).

The *discussion* aspect involves a critical appraisal of the literature. A review is considered high quality when the writer is able to add new or alternative perspectives to the discussion. Beginning researchers often find it difficult to comment on the limitations or significance of various findings (Boote and Beile 2005; Froese, Gantz, and Henry 1998;

Holbrook 2007; Miguel and Nelson 2007). For instance, Holbrook (2007) reported that beginning researchers may simply cite findings from different studies without relating these findings to their own empirical studies. He also added that many of them merely provided a summary of different key ideas without any discussions or comparison of the different theoretical positions of the different authors. Froese, Gantz, and Henry (1998) further explained that students face this issue because they are not comfortable with including their own opinions or voices in a literature review.

Conceptual challenges

Conceptual challenges are related to how one perceives what a literature review entails. These challenges are usually due to superficial understandings of the higher functions and processes of a literature review. Specifically, beginning researchers generally are unaware of the centrality of a literature review, where it is tightly linked to other sections in research.

Literature review is intimately related to all sections of a paper. Specifically, literature review helps justify why a study is worthwhile; what research questions to ask in the introduction; what methodology to adopt; and even what implications to elaborate on in the discussion. Scholars found that many graduate students exhibit too narrow a conception of literature review (Bitchener and Banda 2007; Boote and Beile 2005). For example, Bitchener and Banda (2007) found that a high proportion of students had little understanding of the various functions of a literature review in a research project, particularly in the areas of identifying gaps, justifying the significance of a project, and evaluating published literature.

Students' conceptions of the literature reviews were of a lower function, such as seeing a literature review only as a listing of publications, or as a search for papers (Bruce 1994; Alton-Lee 1998; Phillips and Pugh 1987). Such a concept is not likely to produce a review that shows a 'fully professional grasp of the background theory' (Phillips and Pugh 1987, 53), which requires good synthesis and interpretation. In discussing functions of a literature review, Lather (1999) stated: 'A [literature] review is gate keeping, policing, and productive rather than merely mirroring … [it is] a critically useful interpretation and unpacking of a problematic that situates the work historically and methodologically' (3).

Literature review goes beyond simply reporting the state of developments in a particular niche area. Failing to situate review results in their social, cultural, and historical backgrounds and future developments, beginning researchers relinquish their responsibility of being critical reviewers.

Most beginning researchers were not aware of the reflexive nature of a literature review process where different phases of a literature review co-inform and co-refine one another. A reflexive process means that although different phases in a literature review appear to be linear, they actually influence and co-inform each other. For example, an original decision of scope may help identify a certain number of papers. The relevance, quality, and quantity of these papers will inform what else should be included or excluded, leading to a revised decision on the scope.

Kwan (2008) found that a literature review is a nexus of different phases, which inform individuals of the many decisions to make in the process. Similarly, Suri and Clarke (2009) argued that the process of a literature review is reflexive, in which decisions made during a particular phase are intimately related to the other phases. In other words, the different phases are hermeneutically both conditions and consequences of the whole literature review process.

An individual's perception shapes his or her actions, which eventually leads to differing qualities of a literature review. Lack of awareness of the reflexive nature of literature review negatively impacts the quality of a literature review. Beginning researchers might, as far as possible, try to minimize any changes in a literature review focus and directions even when they realized that it was necessary to do so (Kwan 2008).

Ontological challenges

The last type of challenges is also related to conception. Unlike conceptions of a literature review, they relate to how researchers perceive themselves as confident reviewers. We call these ontological challenges.

Ontological challenges are mostly related to the difficulty experienced in identifying oneself as a competent and confident reviewer, which is, at its core, an identity issue (Golde 2007). Although the issue of identity has been extensively researched in other fields, it is rarely included in the research on challenges faced by beginning researchers in conducing literature review. Beginning researchers are most likely experiencing challenges in identifying themselves as qualified researchers in the scholarly community. According to Wenger's description of the community of practice (1998), beginning researchers are legitimate peripheral participants. On the one hand, beginning researchers are lacking in confidence and unsure of their own judgments. On the other hand, working with the literature provides a gateway for beginning researchers to join in the scholarly community.

Beginning researchers' struggle with identity complicates their role as literature reviewers. In the literature searching process, they often feel inadequate in playing the critical reviewing role independently due to lack of confidence. For example, Ph.D. candidates wanted expert assistances from librarians and insights from professors to reassure that they have not missed important papers through their search strategies (Warburton and Macauley 2014). In terms of writing, 'Writing well and with confidence, particularly about others' work, is a challenge for many students in every discipline' (Golde 2007, 344). In this respect, the literature review process involves developing an identity through the writing process itself. Therefore, what is often attributed to poor writing is actually less of a language issue but more of an identity one (Golde 2007; Kamler and Thomson 2006, 2008). For example, a review citing other authors all over the paper in a disorganized manner may be an indication that the reviewer lack confidence (Kamler and Thomson 2008). Beginning researchers might feel that they are not qualified to judge others' work and that their viewpoints do not count. In addition, identity is coupled with challenges related to voice. A piece of writing distinguishes itself by its author's voice. Over-reliant on quotations from other works is a sure sign of loss of the writer's voice. Beginning researchers often find it difficult to differentiate between views of their own and those of the article authors.

Researchers (Golde 2007; Kamler and Thomson 2008; Kwan 2009) have further argued that ontological challenges should be examined in the broader context of academia in terms of communities of practice and individuals' socio-historical backgrounds. For example, Kamler and Thomson (2008) suggest that use of metaphors such as seeing oneself as joining a group of peers in a social party may help to create a positive and more equal self-image as a reviewer. Discussing on helping students in the educational discipline to develop their professional identities, Golde (2007) considers it essential to socialize students into the norms and values of the scholarly community as early as possible: 'If working with the literature effectively is crucial for every educational researcher, multiple

opportunities to do so before the dissertation stage should be woven through the student career' (344). To induce students into the culture of the scholarly community, Golde (2007) recommends journal clubs as a way to immerse education students in the culture of the profession. Journal clubs is a borrowed practice from the biological sciences. A journal club includes faculty members, postdoctoral students, senior graduate students, and new graduate students who meet regularly to discuss and present articles in recent research journals. All club members are considered and treated as equals. Each meeting focuses on one single journal article. By participating in journal clubs, students could be exposed to the way experienced professionals work with the literature.

In summary, Table 1 shows the list of the 32 papers and how each paper discusses one or more of the challenges beginning researchers tend to encounter in conducting literature review.

Discussion

The LMCO framework summarizes challenges faced by beginning literature reviewers. Our discussion focuses on identifying critical gaps and making recommendations for future studies and graduate preparatory programs. The discussion will center on the following areas: the discourse of literature reviews, a process-oriented approach, interventions to address misconceptions, and identity formation.

The discourse of literature reviews

In the area of linguistic challenges, most studies remain concentrated within linguistic disciplines, focusing on NNS or international student learners, while foregrounding their lack in linguistic competencies as a barrier to quality literature review efforts. To attribute one's linguistic system as the basis of higher order cognitive functions for a literature review, there is a need to identify a 'discourse of literature reviews' that best mitigates issues of lower order literature review functions of listing and 'voice-less' mirroring of developments in current niche areas (Boote and Beile 2005; Holbrook 2007).

At a fundamental level, inadequacy in linguistic competencies does bear upon beginning researchers' efforts in making meaning of the literature. Meaning making, as arising from the interplay between the literature review processes of searching, scoping, analyzing, and synthesizing, links to broader notions of knowledge construction in the literature review. In this regard, as researchers make meaning and construct new knowledge, they too should be aware of 'the ways in which the researcher as an individual with a particular social identity and background has an impact on the research process.' (Robson 2002, 22). This implies the pertinence for researchers to acknowledge the dialectical interplay between prior constructed knowledge with new knowledge construction and, to some extent, share this cognizance with readers. Paralleling this to Vygotsky's (1978) theory of cognitive development, where one's linguistic system forms the basis of higher cognitive functions, a beginning researcher's competency in applying and appropriating the relevant literature review linguistic system may thus be argued to be fundamental in conducting desirable review work – one that goes beyond merely reporting the state of developments in a particular niche area to one that imbibes a social responsibility of theoretically creating new knowledge. At a quotidian level, a beginning researcher's linguistic repertoire thus interweaves with his or her ability to give their own voice to the review synthesis.

Table 1. Summary of the LMCO challenges by authors.

Author	Linguistic	Methodological	Conceptual	Ontological
Alton-Lee (1998)			*	
Anisfeld (1987)		*		
Bitchener and Banda (2007)	*			
Bitchener and Busturkmen (2006)	*			
Boote and Beile (2005)		*	*	
Bruce (2001)		*		
Carson (2001)		*		
Cooley and Lewkowicz (1997)	*			
Das (1985)	*			
Franken (2012)	*			
Froese, Gantz, and Henry (1998)		*		
Golde (2007)				*
Granello (2001)		*		
Holbrook (2007)			*	
Holbrook et al. (2004)		*		
Johns (1997)	*			
Kamler and Thomson (2006)				*
Kamler and Thomson (2008)				*
Kaplan (1972)	*			
Kaplan (2001)	*			
Kwan (2008)	*	*	*	
Kwan (2009)			*	*
Liu and You (2008)	*			
Matalene (1985)	*			
Miguel and Nelson (2007)		*		
Mohan and Lo (1985)	*			
Morrison and Kim (1998)		*		
Philips and Pugh (1987)			*	
Qian and Krugly-Smolska (2008)	*			*
Suri and Clarke (2009)			*	
Turner and Bitchener (2008)	*			
Warburton and Macauley (2014)		*		*
Wilhelm and Kaunelis (2005)		*		
Zhu (2004)		*		

* Indicate the identified or retrieved concepts from each respectative paper.

Discourse of literature reviews acknowledges the interplay of various factors influencing beginning researchers on conducting literature review. It should be noticed that linguistic incompetency might be a disguised form of method inadequacy, conceptual superficiality, and identity confusion. It is imperative that future studies explore how these factors interplay to impact a literature review process. The current bulk of studies on linguistic challenges remain concentrated within Linguistic and Applied Linguistic disciplines. At the same time, a limited number of studies from the Healthcare, Information Technology and other disciplines on challenges in a literature review may be found. To provide a more holistic picture of the landscape research studies from other disciplines can be embraced. To this end, a more interdisciplinary research into linguistic challenges can provide a more in-depth understanding of challenges faced by the beginning researchers in this area.

Furthermore, we recommend that extended roles of writing centers may be considered. Most graduate schools have established writing centers, which could be of great help to graduate students, especially NNS students. However, as discussed above, there is interplay of various factors influencing student writing. A piece of poor writing might not merely reflect writers' linguistic inadequacy. Mentors in writing centers should, first of all, diagnose the causes of student writing problems so they can develop strategies to help students overcome the challenge. Mentors in writing centers should keep close contact with advisers who oversee dissertation writings of graduate students. Advisors could provide their perceptions and insights in helping graduate students with their writing problems.

A process-oriented approach

In the area of methodological challenges, whilst ways have been documented in helping beginning literature review researchers overcome challenges within the phases of scoping, analyzing, synthesizing, and discussing, these findings remain concentrated on the final literature review product. There is a necessity to shift the focus toward a more nuanced and process-oriented approach to investigation that takes into consideration not only the students' literature review outcome, but also their trajectories of becoming a good researcher adept at literature review processes. This would entail unpacking the intertwined other challenges faced by beginning researchers. For example, inadequacies in technological skills of using EndNote (a bibliographical application) and in manipulating spreadsheets might pose as significant barriers to students' analysis and synthesis endeavors. Additionally, students face difficulties in extracting ideas from their scoped literature. Moreover, students may also encounter epistemological challenges in deciding whether the gathered ideas from the various literature help construct new understanding of existing body of knowledge from the reviewed literatures. In other words, they often faced challenges in discerning the quality of what they have found. These epistemological challenges, however, were encountered by researchers when they were reviewing massive literatures in the collaborative settings (Toye et al. 2014). Although it is possible that this epistemological challenge can also be present when a beginning researcher is conducting literature reviews individually (as opposed to collaboratively), further study is needed to explore this possibility. In addition, there exists a gap in studies that identify and address such issues of students' meaning-making and extraction of salient ideas critical to the agenda of their overall research. Instead, most of the studies remain situated within linguistic disciplines and address issues of reading, comprehension, and heuristics not specifically pertaining to the literature review processes.

This literature review shows that linguistic and methodological challenges, and its related ways of helping beginning researchers in a literature review, were mostly inferred from the reviewers' final literature review products, for example, in terms of assessing the structure of the students' literature review papers (Turner and Bitchener 2008). In this regard, it is imperative that research in a literature review takes on a more process-oriented approach in terms of understanding the challenges faced by beginning researchers through their research trajectory. Research should be conducted focusing on specific process rather than on finished products. For example, studies could be conducted to investigate the process of scoping: What is the thought process of beginning researchers in scoping data? What actions do they tend to take while overwhelmed with large volume of data? What reasons do they give when they choose one piece of data instead of the other? How does

familiarity with technologies affect the process of scoping? Do beginning researchers familiar with technologies fare better than those who are not in the process of scoping? Thinking-aloud could be employed as a research method to record student thinking and actions in the process of scoping, analyzing, synthesizing, and discussing data. An alternative research method is to ask beginning researchers to keep a journal to record their thoughts and actions in the process.

Interventions to address misconceptions

The conceptual challenges identified in this paper provide rich insights for designing the literature review pedagogical interventions. Empirical studies could be conducted to investigate effective interventions to help beginning researchers recognize and address misconceptions in conducting a literature review.

Beginning researchers tend to hold rigid and linear viewpoints about literature review, which might be due to the fact that literature review is often conceptually divided into distinct phases. For example, Cooper (1982, 1989) conceptualizes a linear literature review process which he divides into five stages. Although Cooper's approach provides a clear progression of the literature review process and appeals to systematic analysis, such demarcation oversimplifies the dynamic relationships among different phases into a linear one. For instance, results from later phases (e.g., analysis) may affect one or more earlier phases (e.g., problem formation), and vice versa. Although the literature review process can be conceptually divided into different phases, it is naturally reflexive. There are also arguments that the literature review process may not always start from problem formulation (Charmaz 2005).

Interventions to address misconceptions could start small from the library. To help graduate students in conducting literature review, many university libraries post literature review guidelines on their websites. These literature review guidelines offer step-by-step help to graduate students in conducting literature review. However, these guidelines contribute little to helping graduate students overcome conceptual challenges. Since these guidelines follow the same linear format, dividing the process into distinct stages, it runs the risk to reinforce student linear viewpoints about literature review. University libraries could play a role in helping graduate students to overcome their misconceptions about literature review. In addition to post a step-by-step guideline, university libraries could design interventions to address student misconceptions about literature review. These interventions could include posting research findings, offering workshops, and maintaining interactive discussion forums.

In the long term, graduate preparatory programs should take on the responsibility to design and implement interventions to address student misconceptions about literature review. Traditionally, graduate preparatory programs require students take research methodology courses where literature review is covered as an insignificant slice. Rarely does a graduate preparatory program offer a literature review course to address student misconceptions about literature review. Conducting literature review is a huge task. The challenges identified in this literature review point to the necessity for graduate preparatory programs to offer a series of literature review courses. Literature review courses should break the traditional way to treat literature review in a linear and sequential fashion and align the course content to challenges students encounter in conducting literature review. For example, the course could start with addressing student misconceptions about literature review and proceed to address other challenges.

Identity formation

The ontological area is one worthy of close attention. The identity issue is likely to be at the core of other difficulties beginning researchers face in the process of working on the literature. For example, a piece of poor writing might not be due to linguistic challenges as much as an identity problem. Therefore, identity plays a pivotal role in successful preparation of educational researchers.

Identity formation should be a critical component in graduate preparatory programs. Contrary to the traditional knowledge transmission approach, the social constructivist approach considers ontology, specifically identity formation, as an important and inseparable part of learning (Aitchison and Lee 2006; Lesko et al. 2008; Maher et al. 2008). Learning is not merely a process of acquiring skills. Learning is a process of becoming. Knowledge and identity are inseparable, as Wenger (2010) points out that knowledge and identity co-constitute each other at the time of learning.

Competence is at the core of identity formation. Competence in constructing and negotiating meaning is recognized and valued in communities and enables participants to gain a legitimate identity. On the contrary, lack of competence in meaning-making will lead to the development of an identity of marginality (Tsui 2007). Nevertheless, competence is not a set of narrowly defined skills. Skills and 'becoming' differ qualitatively from each other. For example, knowing components in a literature review does not make one become a researcher and contributes little in overcoming challengers a researcher encounters in conducting literature review. To become critical literature reviewers, graduate students need to learn to think and act as professional researchers.

Wenger (1998) considered that two essential elements are crucial in the process of identity formation. These two elements are a process and a place:

> Viewed as an experience of identity, learning entails both a process and a place. It entails a process of transforming knowledge as well as context in which to define an identity of participation. As a consequence, to support learning is not only to support the process of acquiring knowledge, but also offer a place where new ways of knowing can be realized in the form of such identity (Wenger 1998, 215).

Following Wenger's statement (1998), future research on identity formation of beginning researchers should focus on investigating places where identify formation could take place and processes that shape identify formation. What are the places where beginning researchers could learn and act as professional researchers? How do these places support and nurture identity formation of beginning researchers? Will identity formation develop in online research communities? How should the process be designed to effectively promote identity formation of beginning researchers in face-to-face as well as online research communities? The findings from the research should provide evidence-based data to help graduate preparatory programs in cultivating identify of graduate students.

Graduate preparatory programs shoulder dual tasks. As major units to train graduate students, the preparatory programs could create places and design corresponding process to help graduate students develop a legitimate identity as researchers (responding to the ontological challenges). In addition to offering formal training courses (responding to methodological and conceptual challenges), the programs could introduce graduate students to informal learning communities such as journal clubs and various online research communities. These communities of practice could socialize graduate students with experienced researchers and expose beginning researchers to thoughts and actions of

experienced researchers (responding to linguistic challenges). On the other hand, graduate schools possess ideal contexts where to conduct research on identity formation. Action research and design-based research can be conducted to track the process of identity formation of graduate students and investigate effectiveness of places and processes where identity formation is cultivated.

Conclusion

In this paper, based on the grounded theory-driven analysis and synthesis of the extant publications on literature reviews, we propose an LMCO framework to illustrate challenges faced by beginning researchers in conducing literature reviews. Arising from this framework, we have identified challenges and gaps in the field that underpin our call for future studies on challenges of beginning researchers face in conducting literature review. Within the same vein, we recognize that there is generally a lack of suitable training programs to equip researchers with skills to conduct literature review (Qian and Krugly-Smollska 2008). To solve this issue, we propose that a good literature review preparatory program should address the challenges as expounded within our LMCO framework. With time, it is within our vision that these endeavors may promise a more vibrant research culture as part of the educational research ecology.

Disclosure statement

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