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Teachers who Initiate Changes with an Ebook-Integrated Curriculum: Revisiting the Developmental Assumptions of Stages of Concerns in the Concerns-Based Adoption Model

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Understanding teachers' concerns about integrating new technology to their curricular practices is essential for the improvement of pedagogical practices. Using in-depth interviews, this study aims 1) to explore and describe concerns of teachers who attempted to initiate ebook-integrated curriculum independently in a higher education setting, and 2) to examine how well the Stages of Concerns (SoC) in Concerns-Based Adoption Model (CBAM) explains the change processes of the teachers. This study challenges the developmental assumptions underlying the SoC in CBAM and suggests that the theoretical framework must address individuals' idiosyncratic traits as a contextual factor to better explain the change processes of teachers who initiate change in higher education. Additionally, future research directions pertaining to the adoption of innovations by teachers are suggested.

Afin d'améliorer les pratiques pédagogiques, il est essentiel de comprendre les préoccupations qu'ont les enseignants par rapport à l'intégration de la nouvelle technologie à leurs pratiques pédagogiques. Reposant sur des entrevues en profondeur, cette étude a comme objectif, d'une part, d'explorer et de décrire les préoccupations d'enseignants qui ont tenté, de façon autonome, d'initier un programme d'études intégrant des livres électroniques dans un milieu universitaire, et d'autre part, d'examiner la mesure dans laquelle les étapes de préoccupation du modèle d'adoption reposant sur les préoccupations (Concerns-Based Adoption Model CBAM) réussissent à expliquer les processus de changement chez les enseignants. Cette étude remet en question les hypothèses développementales sur lesquelles sont fondées les étapes de préoccupation du CBAM et propose que le cadre théorique doive considérer l'idiosyncrasie des gens comme facteur contextuel pour mieux comprendre les processus de changement des enseignants qui initient des changements dans les milieux universitaires. Nous proposons également des orientations de recherche à l'avenir portant sur l'adoption d'innovations par les enseignants.

In this 21st century, change is inevitable across sectors, and the education sector is no exception (Choctaw, 2016). Priestley, Edwards, Priestley, and Miller (2012) described this phenomenon as "a ubiquitous fact of life of today's schools" (p. 191), and many educational scholars noted that rapid development of technology and its increased accessibility play a significant role in promoting the changes of current instructional practices (Inan & Lowther, 2010; Kim, Kim, Lee,

Spector, & Demeester, 2013). Put specifically, teachers' efforts to integrate technology into their curricular practices are expected to improve both students' academic performance and teachers' effectiveness while advancing the technology skills students will need in their future workplaces (Davies & West, 2014; Stes, De Maeyer, Gijbels, & Van Petegem, 2012). Consequently, teachers' effective use of technology in their classrooms has been encouraged in response to the pressure of educational policies that increasingly call for accountability (Larson, 2010).

However, the reality falls short of expectations (Rienties, Giesbers, Lygo-Baker, Ma, & Rees, 2016). Ertmer and Ottenbreit-Leftwich (2010) surveyed research from large- and small-scale studies and concluded that both in the United States and internationally effective technology use has failed to reach the high levels anticipated. Some studies have noted that a majority of teachers use technology for auxiliary purposes that are not directly related to students' learning, such as administrative and communicative tasks (Culp, Honey, & Mandinach, 2005; Palak & Walls, 2010). Others have shed light on teachers' resistance to the adoption of technology that would change their current curricular practices and on the barriers that exist even when they do try to implement changes (Blackwell, Lauricella, Wartella, Robb, & Schombug, 2013; Hew & Brush, 2007).

Recognizing these disappointments, a large number of studies have underscored the role teachers play as agents of change who can facilitate the integration of technology in a manner that improves teaching effectiveness as expected, (Davis & Roblyer, 2005; Dobbs, 2004; Finley & Hartman, 2004; Lochner, Conrad, & Graham, 2015). These studies often employed the Concerns-Based Adoption Model (CBAM) as their theoretical framework in relation to a variety of innovations, from broad curriculum reform to specific instructional practices (Hao & Lee, 2015; Sanders & Ngxola, 2009; Wang, 2013; Wong & Cheung, 2015). In addition, CBAM has been widely used in various educational settings such as K-12 (Brenner & Brill, 2016; Rakes & Dunn, 2015), professional development (Holland, 2001; Saunders, 2013), and across cultures (Cheung & Yip, 2004; Yang, Kim, Kim, & Kim, 2013).

Despite its widespread use, questions have arisen about the CBAM's applicability and underlying assumptions. Developed in the context of mandated changes in curricular practice, the CBAM may not be applicable to instances where instructors have acted on their own initiative to implement change (Anderson, 1997; Straub, 2009). Additionally, the CBAM's model for Stages of Concerns (SoC) relies on assumptions that the earlier stages must precede later ones, and experiences with the innovation must be involved in advancing the stages, a developmental progression that a review of the scholarly literature suggests should be revisited (Anderson, 1997; Kwok, 2014).

This paper reports on a study that aimed to revisit the developmental assumptions of SoC in CBAM and identify additional facets that can improve the model in a manner that explains the change processes of teachers who initiate change independently. Following a review of the literature on the CBAM itself, and on ebook-integrated curricular practices, the paper examines the concerns of four instructors who initiated integration of ebooks into their curricular practices in higher education settings. The four instructors volunteered to implement their academic institution's ebook initiative as early adopters prior to their institution's efforts to diffuse the innovation university-wide. The study further assessed whether the concerns of these instructors who independently initiated curricular change correspond with the developmental stages suggested by CBAM, thereby confirming the large body of research that has investigated concerns of teachers in response to mandated innovations. Finally, the paper assesses the limitations of the present study and suggests avenues for future research.

Literature Review

Concerns-Based Adoption Model (CBAM)

The Concerns-Based Adoption Model (CBAM) was initially proposed by Hall, Wallace and Dossett (1973). It is based on Fuller's (1969) conceptualization of teachers' concerns, which includes three developmental phases: pre-teaching (non-concern), early teaching (concern with self), and late concerns (concern with pupils). The model highlights the change processes of teachers at individual and group levels (Saunders, 2012) and has been used to design professional development programs for supporting teachers' adoption of educational innovations, as well as to evaluate the effectiveness of such programs (Hall & Hord, 2011).

CBAM has been touted as "the most robust and empirically grounded theoretical model for the implementation of educational innovations" (Anderson, 1997, p. 331) and is recognized as a valid and reliable measurement for assessing their implementation (Hall & Hord, 2011). However, CBAM has also had some critics. Anderson (1997) noted that CBAM's framework was primarily based on studies in which teachers react to changes backed and/or mandated by others, and he questioned its applicability to describe and predict change processes of teachers who initiate curricular changes independently:

> How well the model anticipates and explains bottom-up changes initiated by the participating teachers, versus teacher response to changes advocated or mandated by others, is a question that has not been systematically explored, and one that would be worthy of future research. (p. 333)

In a similar vein, Straub (2009) also criticized the framework's "disregard of teachers' positive perceptions of innovation" (p. 636). He confirmed that CBAM generally deals with mandated innovation only and called for research that examines interaction between teachers' preferences toward a particular innovation and their concerns for its implementation:

> By ignoring teachers' possible preferences for an innovation, this model sells teachers short by portraying them as resistant luddites. In addition, the CBAM admittedly primarily deals with top-down change (Hord et al., 1987). How preferences for an innovation implementation interact with concerns for a particular implementation is an issue for future research as well. (p. 636)

CBAM has three diagnostic instruments designed to describe and measure change processes among teachers: stages of concern (SoC), levels of use (LoU), and innovation configurations (IC). SoC describes the affectional domain while the other two tools measure behavioral aspects of teachers' change processes. Both SoC and LoU focus on teachers' change processes at the individual level (George, Hall, & Stiegelbauer, 2008), but IC describes how multiple teachers' implementation of the same innovation may differ from one another (Anderson, 1997; Kwok, 2014; Saunders, 2012). Each of these instruments has been used in different settings in conjunction with various types of innovations (Christou, Eliophotou-Menon, & Philippou, 2004; Chamblee, Slough, & Wunsch, 2008). As the focus of this study is individual instructors' concerns with regard to ebook-integrated curricular practices, only SoC is discussed in detail.

SoC is the most representative of CBAM as a whole (Hall, 1979) and also the most widely used of the three diagnostic instruments (Hall & Hord, 2011). SoC measures the "feelings, observations, problems, successes, and failures" (Rakes, Dunn, & Rakes, 2015, p. 1024) of individual teachers during the adoption process for an educational innovation. Table 1 shows the

seven stages of teacher concern based on Christou et al.'s (2004) descriptions of each. Additionally, van den Berg, Sleegers, Geijsel, and Vandenberghe (2000) grouped these stages into three categories based on similar traits: stages 0-2 primarily involve self-concerns, stage 3 addresses task concerns, and stages 4-5 are concerned with impact concerns. Stage 6 (refocusing) is independent of those three types of concerns but is nevertheless regarded as the most sophisticated.

SoC reflects one of the fundamental assumptions of CBAM (see Straub, 2009, p. 633 for all six assumptions of CBAM): the change processes encompassing teachers' concerns are developmental in nature (Anderson, 1997; Baruch & Avidov-Unger, 2014; Saunders, 2012). The escalating and sequential nature of stages in SoC establishes that lower levels of concern must be resolved in order to stimulate the higher levels of concern. Moreover, experience with the innovation is the key element to move the transition forward. Even if it were possible for teachers to demonstrate several stages concurrently (Bitan-Friedlander, Dreyfus, & Milgrom, 2004), there would be differential degrees of intensity at each stage (Cheung, Hattie, & Ng, 2001). Citing Hall and Hord (1987), Kwok (2014) described this point as follows:

> Teachers who are informed of the change but have not yet started implementing the innovation have a higher intensity of self-concern. This focus shifts to task concern when teachers start to implement the innovation. As teachers gain more experience with the innovation, their attention will be drawn to the effect of the change on students and the means to improve the change. Thus, experienced users have intense impact concern. (p. 45)

Table 1

Seven Stages for the Evaluation of Teachers' Concerns Used in the SoC Questionnaire, Based on the Categorisations Devised by Christou et al. (2004) and van den Berg et al. (2000)

Stage		Description
Self-concerns	Awareness (Stage 0)	Teachers are aware of an innovation but have no interest in its implementation.
	Informational (Stage 1)	Teachers encounter opportunities to learn about the implementation of an innovation. Specifically, instructors search for usage scenarios based on their actual needs, rather than a desire to acquire comprehensive knowledge.
Task Concerns	Personal Concern (Stage 2)	Teachers are primarily concerned with the personal ramifications of an innovation once implemented.
	Management (Stage 3)	Concerns mainly entail managing the implementation of an innovation in the classroom; teachers encounter practical problems or difficulties with the implementation and attempt to devise solutions.
Impact Concerns	Consequences (Stage 4)	Concerns shift from the personal to student level, with a focus on effective learning. Positive outcomes will likely result in the continued implementation of an innovation.
	Collaboration (Stage 5)	Teachers express interest in sharing their experiences with colleagues in order to refine the implementation of an innovation.
Independent of Concern	Refocusing (Stage 6)	Teachers examine the consequences of an innovation's implementation, discuss it, and suggest improvements.

At this point, it is worthwhile to note that progression toward advanced stages in SoC does not necessarily happen to every teacher who undertakes innovation. Anderson (1997) elaborated this point with the following accounts:

> The resolution of Management concerns often led to a "flat" profile reflecting routinization of use and no major concerns about innovation use. While the predicted emergence of intense impact-oriented Consequence and Collaboration concerns did occur among teachers in some settings, it did not occur in others. (p. 357)

This may explain why some teachers remain at the stage where they use technology for their own administrative purposes, without moving toward concern about its effective use for student-centered pedagogy, as Culp et al. (2005) and Palak and Walls (2009) have reported. Although SoC acknowledges cases of teachers who maintain the "flat profile" (Anderson, 1997, p. 357), those cases do not necessarily negate the assumption of SoC in CBAM that advanced concerns can be aroused sequentially after lower concerns are resolved through experiences with the innovation.

However, SoC-directed developmental stages were not only used with considerable modifications, but also criticized with regard to their validity and reliability in several contexts in the field of education. For example, Cheung et al. (2001) expressed concern regarding the scarcity of empirical studies that corroborate the construct validity of SoC, and subsequently conducted confirmatory factor analyses using data collected from 1622 teachers who assisted in implementing the Target Oriented Curriculum (TOC)—a radical curriculum reform led by Hong Kong educational authorities. The results indicated that SoC had some items with low reliability and demonstrated poor fit to a number of indices, from Root Mean Square Error of Approximation (RMSEA) to Tucker-Lewis Index (TLI). Additionally, in a study of 812 teachers who implemented the innovation of a school-based assessment of science students' practical skills in Hong Kong, Cheung and Yip (2004) discovered that the degree of teacher concern at higher levels is not necessarily strengthened by experience with an innovation. Specifically, they found that teachers experienced with the innovation demonstrated less intensity for the concern of consequence when compared to the teachers who had less experience with the innovation.

Kwok (2014) refuted CBAM's sequential and linear concept that teachers' change processes are directed by the accumulation of experiences with the innovation. His study explored Hong Kong secondary school teachers' concerns about the education reform that introduced an interdisciplinary subject for senior-level Liberal Studies (LS) through surveys and semi-structured interviews. For the analysis of the data collected through surveys, he divided the participating teachers into three groups: those with no experiences with LS, those with teaching experience in a similar subject called Integrated Humanities (IH) and junior-level LS, and those with teaching experience with non-interdisciplinary, advanced-level LS. In other words, his study included teachers who were new to the innovation (the first group) and teachers who had similar and transferrable experiences with the innovation (the second and third groups). He investigated if there were any significant differences among the three groups in terms of the strengths of each level of concern described in SoC. The results indicated that the teachers across the three groups did not demonstrate statistical differences in terms of their concerns for the stages of Management, Consequence, and Collaboration, while the teachers who had relevant and transferrable experiences in teaching senior-level LS indicated a higher level of concerns with regard to the stage of Refocusing.

He further discussed this finding in relation to other studies, arguing that teachers' concerns do not necessarily follow the sequential progressions suggested by the SoC in CBAM:

> The second disagreement is regarding the sequential development of the concern profile. CBAM expects the profile to peak successively from self-concern to task concern and finally at impact concern as innovation unfolds. The developmental features of the SoC can be gleaned from the simplex structure of the correlation matrix among the SoC. The studies by Cheung and Yip (2004) and Cheung et al. (2001) tested the simplex structure and found that it was not supported. Other studies (e.g. Ceinkaya 2012; Vandenberghe, 1983) although not explicitly testing the simplex structure, found that intense impact concerns appeared for non-experienced users of the innovation. In the present study that flat and intense concern profile is in conflict with Hall's model, which expects the profile to peak at the self-concern stage. (pp. 52-53)

Kwok (2014) further suggested that the fit of SoC can vary according to cultural context, a point that is also supported by Anderson (1997), who notes that context is "the final piece of the CBAM" (p. 337). Kwok (2014) reported that the examination-oriented culture of the society in which the teachers lived prompted those teachers to express their concerns over students' academic achievements despite their lack of experience with the innovation.

> CBAM is a useful theoretical model for analyzing different types of concern at the personal level, but in the actual implementation of reform the concerns of teachers are the result of interactions between the institutions they serve, the societies they live in and the type of innovation involved. These interactions may lead to arousal of later stages of concern. (p. 53)

Ebook-integrated Curricular Practices

This section discusses previous studies that have explored the innovation of ebook-integrated curricular practices and found gaps that need to be filled. First, the term "ebook" needs to be operationalized. Although researchers have not reached a consensus, the definition of ebook offered by Nelson (2008) is appropriate for use in this study, as it underscores the medium's versatility as an instructional resource: "an electronic book that can be read on a computer screen, a special ebook reader, personal digital assistant (PDA), or even mobile phone" (p. 42). Ebooks were initially envisioned by Bush (1945) as hypertext engines or mechanized libraries, wherein individuals could house books as well as record and interact with media using a flexible retrieval system. Bush's vision has since been realized and surpassed; we are now capable of doing much more with the ebook than he originally imagined.

The increased use of portable electronic devices such as smartphones and tablets in our daily lives has revealed enormous educational potentials and benefits of ebooks in educational practices (Daniel & Woody, 2013; Johnson, Levine, Smith, & Stone, 2010; Rogers, Connelly, Hazlewood, & Tedesco, 2010). In fact, many studies have focused on how ebooks benefit students. For example, several studies have highlighted the usefulness of ebooks in developing customized curricula that reflect the needs and interests of individual students. As an example, Huang, Liang, Su, and Chen (2012) developed and implemented an interactive ebook learning system that adopted several personalized features such as annotation and learning process tracking. This system assisted teachers in enhancing 166 elementary school students' individualized learning experiences and reading literacy.

Additionally, some researchers have found that students exhibit a higher degree of engagement in learning processes when ebooks rather than more traditional media are used. Hermon, Hopper, Leach, Saunders, and Zhang (2006) reported that undergraduate students were more likely to be engaged when instructors gave them opportunities to use ebooks in various activities, such as by leading classroom discussions that utilized passages from ebooks, or by providing students with the names of authors and their works for personal reference. Likewise, Jones and Brown (2011) examined the level of elementary students' reading engagement using both ebooks and traditional print books; they found that students were more motivated to read ebooks than print books due to the former's ancillary features, such as read-aloud narration.

Unlike comprehensive examinations of ebook use from students' perspectives, studies that explored teachers' experiences, perspectives, or concerns toward the use of ebooks were limited in scope, especially in the context of higher education. The majority of studies that investigated faculty use of ebooks concentrated on educators' preferences or on comparisons between traditional textbooks and ebooks (Carlock & Maughan Perry, 2008; Shin, 2014; Waters, Roach, Emde, McEathron, & Russell, 2014). For example, Cassidy, Martinez, and Shen (2012) studied a large pool of graduate students and faculty in terms of their motivation to use ebooks; their study highlighted the similarities and differences between ebook users and non-users. Although they provided valuable findings that delineated which features of ebooks motivated faculty to use them and implications that could promote their adoption, the interest of this study was the adoption of ebooks for their research purpose rather than for their instructional purpose.

Carlock and Maughan Perry (2008) further claimed that this line of inquiry limited its methodological approach largely to surveys. As an example for such survey research in relation to the use of ebooks in the higher education setting, Abell and Garrett-Wright (2014) investigated the concerns of 50 nurse educators who had used ebooks for fewer than two years and found that most of them were at the stage of self-concern. The scrutiny of existing literature discovered a study by Martin and Quan-Haase (2013) that used a qualitative approach to explore faculty members' concerns about employing ebooks for their research and teaching activities in the field of history. However, they discussed the faculty's positive and negative attitudes toward the innovation in broad terms without specific focus on how those attitudes were developed in relation to the integration of ebooks into their courses.

The review of literature indicates that in-depth exploration of faculty experiences, perceptions, or concerns over ebook integration into their actual teaching practices would be a meaningful contribution to the fields of education that consider ebook integration.

The Study

The review of existing studies with regard to CBAM, especially SoC, and ebook-integrated curricular practices uncovered the following two gaps. First, studies that challenge the developmental assumption of SoC in CBAM with empirical evidence are scarce. Although Kwok's (2014) study was identified as one that explicitly refuted that assumption with an emphasis on contexts as another facet to be included into CBAM, it did not discuss the concerns of teachers who attempted to initiate the innovation independently or teachers who had a positive perception toward the innovation, as called for by Anderson (1997) and Straub (2009). Second, unlike comprehensive investigations concerning the use of ebooks in relation to students' learning processes, in-depth efforts that use a qualitative approach to capture teachers'

concerns about the integration of ebooks into courses are relatively rare (Carlock & Maughan Perry, 2008).

To fill these gaps, the present study aims to: 1) explore and describe the concerns of four instructors who independently integrated ebooks into their curricular practices in higher education settings in a qualitative manner and 2) examine if their concerns with the ebook follow the developmental stages of concerns in CBAM, as demonstrated in the large body of studies with teachers who reacted to mandated innovation. Specifically, the following questions are asked:

1. What concerns do four instructors who volunteered to integrate ebooks into their curricular practices have?
2. To what extent do the concerns of the four instructors correspond to the developmental assumptions of SoC in CBAM?
    1. Do lower concerns precede higher concerns, as suggested by SoC in CBAM?
    2. Is experience with the ebook-integrated curriculum required to advance the stages of concerns, as suggested by SoC in CBAM?

Methodology

To delineate the concerns of instructors who independently attempted to adopt an identical innovation—ebook-integrated curriculum—a qualitative study with separate semi-structured and in-depth interviews was conducted involving four instructors at a four-year university in the United States. According to Straub (2009), educators' stages of concerns can be measured by either a quantitative or qualitative approach. This study takes the qualitative research approach for the following reasons. First, few studies have explored the experiences of ebook-integrated curriculum from teachers' perspectives in higher education settings in a qualitative manner; rather, the majority of empirical studies that adopted SoC are quantitative in nature.

Second, compared to quantitative data, qualitative data could provide more valuable resources to answer the research questions in this study that specifically seek to uncover teachers' concerns on integrating ebooks for their courses. According to Miles, Huberman, and Saldana (2014), "Qualitative data are a source of well-grounded, rich descriptions and explanations of human processes. With qualitative data, one can preserve chronological flow, see which events led to which consequences, and derive fruitful explanations" (p. 4). They add that researchers have often used qualitative data to challenge or further develop existing conceptual frameworks, an effort that aligns with the purpose of this study (Miles at al., 2014).

Participants and Settings

A-university (pseudonym) is a large four-year academic institution in the United States that launched its own ebook initiative and had a pilot period before diffusing it to faculty university-wide. A-university's initiative included ebooks along with an e-reading platform that has multiple functions to support teaching and learning practices, such as integrating faculty-developed materials, annotations, highlights, bookmarks, and submission of questions to the instructor from the ebook (detailed descriptions of the ebook platform are beyond the scope of this study.) During the pilot period, four instructors Bill, Megan, Tom, and Lauren

(pseudonyms) volunteered to integrate the new innovation into their courses as early adopters.

Bill and Megan had five or fewer years of teaching experience in higher education settings, while Tom and Lauren each had more than 30 years of university teaching experience. Bill, Megan, and Tom independently attempted to integrate ebooks for the first time into their courses on accounting, computer programming, and technology infrastructure in the semester immediately preceding the interview, while Lauren intended to use ebooks for her law course in the upcoming semester. The class sizes were varied, ranging from as small as 25 to as large as 100 students. It is worthwhile to repeat the point that at the time of the interview for data collection three of the instructors (Bill, Megan, and Tom) had prior experiences of adopting A-university's ebook initiative in their courses, and one (Lauren) did not (see Table 2).

Data Collection

A recruitment email was sent to seven randomly-selected academic departments in the A-university, who were asked to distribute the message to faculty members within their department or school. To solicit participants for interviews, the recruitment email outlined the study's purpose, and a brief description of the interview procedures was sent to individuals who applied to participate. The available number of participants turned out to be limited to four instructors since this study needed participants who had already independently attempted to integrate A-university's ebook initiative or who planned to do so in the following semester. After receiving responses from the four instructors who expressed interest in being interviewed, emails were sent in order to schedule interviews.

To ensure anonymity, the participants were assigned random names as pseudonyms (Bill, Megan, Tom, and Lauren). Each interview spanned approximately 60-70 minutes, and was conducted either in person or over the telephone. All four interviews were audio-recorded and transcribed. An interview protocol was developed in order to collect information regarding each instructor's concerns and experiences integrating ebooks into their teaching, in addition to the pedagogical skills that they employed while doing so.

A semi-structured interview format was used to guarantee that interview questions focused on topics pertinent to the study's research question; at the same time, the interview questions were designed in a manner to ensure responsiveness to the interviewees' lead in terms of the discussion's direction and flow. Thus, interviewees were afforded significant latitude in discussing their experiences and opinions, as exemplified in the following sample questions:

Table 2

Participant Demographics

Instructor	Gender	Years of Teaching Experience	Experience with the A-university's ebook initiative	Course Title	Class Size
Bill	M	Five or less	Once	Accounting	45
Megan	F	Five or less	Once	Computer Programming	25
Tom	M	More than 30	Once	Technology Infrastructure	50
Lauren	F	More than 30	None (Plan to use following semester)	Law	100

- Have you ever used ebooks in your courses? If so, how long have you been using them in your teaching?
- What courses have you taught using the ebooks? How large were the classes in which you used the ebooks?
- What motivated you to integrate the ebooks independently into your course?
- What concerns do you currently have regarding the use of the ebooks in your course?

Data Analysis

The analysis of data collected through four separate interviews was guided by the grounded theory (Glaser & Strauss, 1967). The grounded theory allows the researcher to identify common themes that emerge through continuous interaction with data that demonstrates the participants' thoughts and to develop a theory based on that data (Fraenkel & Wallen, 2009). Highlighting the aspect of "continual interplay" (Fraenkel & Wallen, 2009, p. 429), the grounded theory is often denoted as a constant comparative approach (Lincoln & Guba, 1985; Strauss & Corbin, 1994). By adopting the constant comparative approach as an analytical method, this study did not determine the coding scheme prior to analysis, but rather expected it to emerge inductively.

To facilitate the analysis, the interviews transcribed verbatim were imported into Nvivo10. Nvivo is one of the most widely used types of computer-assisted qualitative data analysis software (CAQDAS) in the field of education (Leech & Onwuegbuzie, 2011). It efficiently supports open coding by providing an avenue for "storing, indexing, sorting, and coding" data, which are the core processes of constant comparison analysis (Leech & Onwuegbuzie, 2011, p. 71). In Nvivo, four categories with the interviewees' names as titles were initially created to identify their stages of concerns separately. Based on the two interview questions regarding their motivations and concerns surrounding the use of ebooks in their courses, two parent nodes were created under each category: initial concerns and current concerns for Bill, Megan, and Tom and initial concerns and anticipatory concerns for Lauren. As Lauren was planning to integrate ebooks into her course in the following academic semester, unlike the other three interviewees who already had experiences of using ebooks in their courses, her concerns were labeled as anticipatory concerns instead of current concerns.

Under the two parent nodes for each category (initial and current concerns for Bill, Megan, and Tom and initial and anticipatory concerns for Lauren), the underlying themes were extracted through a constant comparative approach during the analysis process. Put specifically, as many potential categories of analysis as possible were initially created as the researcher coded each statement in the data. These categories were then integrated based on the properties of each category that emerged (Glaser, 1965). For example, the statement, "Since I teach technology, traditional textbooks may not be up to date" was originally placed in a child node entitled "Flexibility" on Nvivo due to its emphasis on the ability of instructors or students to modify or add parts of an ebook to their own materials, while the statement, "The ebooks allow me to insert videos, websites, and highlights, which I think students will find helpful" was coded into the child node named "Editability."

In comparing the two categories, the researcher found that they are related to each other in that both address the interactive feature of ebooks. Hence, these categories were integrated into

a "unified whole" (Glaser, 1965, p. 440), resulting in the child node of "Interactivity" in Nvivo. As briefly demonstrated here, the initial scheme was continuously refined through interaction with the data. Given the subjectivity of qualitative data analysis, quotations from the interviewees are provided in the next section in order to allow for any possible different interpretations. With the analysis, two and three themes (represented as child nodes in Nvivo) emerged for Bill's initial and current concerns respectively, while three and one themes emerged for Megan's initial and current concerns. Likewise, three themes emerged for Tom's initial and current concerns respectively, and three emerged for Lauren's initial and anticipatory concerns respectively. (See categories, parent nodes, and child nodes in Table 3.)

Then, each child node that emerged was classified within the SoC framework according to Christou et al.'s (2004) descriptions for the following seven stages: Awareness (Stage 0), Informational (Stage 1), Personal Concern (Stage 2), Management (Stage 3), Consequences (Stage 4), Collaboration (Stage 5), and Refocusing (Stage 6). For example, the node of efficiency that emerged from the interview with Bill included the following quote: "I can check quickly and immediately as to which problems they find difficult …. It makes my life much easier." As this quotation reflects mainly on the personal ramifications of the ebook, it was classified as

Table 3

Themes Emerged in Nvivo and Corresponding Stages of Concerns

Categories	Parent Nodes	Child Nodes	Stages of Concerns
Bill	Initial Concerns	Affordability	Consequences
		Interactivity	Consequences
	Current Concerns	Efficiency	Personal
		Technology difficulties	Consequences
		Monitoring	Consequences
Megan	Initial Concerns	Affordability	Consequences
		Portability	Consequences
		Interactivity	Consequences
	Current Concerns	Technology difficulties	Consequences
Tom	Initial Concerns	Affordability	Consequences
		Portability	Consequences
		Interactivity	Consequences
		Annotation	Consequences
	Current Concerns	Checking students' reading	Consequences
		Prior experiences	Refocusing
Lauren	Initial Concerns	Affordability	Consequences
		Portability	Consequences
		Interactivity	Consequences
		Too much guidance	Consequences
	Current Concerns	Technology difficulties	Consequences
		Learning curve	Consequences

"Personal Concern" (Stage 2). As another example, the node of technology difficulties that emerged from the same interviewee included the following quote: "There were students who said, 'Oh, I can't access the system.'" As this comment concerns the negative effects of the ebook on students' learning, this was interpreted as "Consequences" (Stage 4) within the SoC framework.

Results

This section reports the major findings of the present study. Specifically, this section presents the concerns of four instructors who independently attempted to use ebooks in their undergraduate courses as early adopters in relation to their stages of concerns and the developmental assumption of SoC in CBAM. This section is organized by the four instructors' initial concerns that drove them to adopt the ebook into their curricular practices independently, the concerns of three instructors who used the ebook during the prior semester, and the concerns of the one instructor who had never used ebooks but was planning to implement the innovation into her courses shortly.

Initial Concerns

In response to the interview question regarding the motivation that drove them to initiate the change as early adopters in their academic institution, three systemic and recurring themes related to the price, portability, and interactivity of ebooks emerged, demonstrating the stage of Consequences in SoC (Stage 4 in Table 1). These three themes demonstrate that the concerns of these four instructors were not rooted in their own needs, but rather the best interests of their students and environmental responsibility.

Affordability. All four instructors called attention to the low cost of ebooks and consequently the decreased financial burden placed on students in obtaining them as a motivating factor in adopting ebooks in their courses. Bill remarked that ebooks allow students to save money, and Megan also acknowledged the low cost of ebooks but added that procuring them assumes students have internet access. Tom related that few students actually buy new textbooks due to their prohibitive cost and that while a traditional textbook may cost $200, the price of an ebook is up to 35% less: "Very few students buy a new textbook, because they are just so expensive … a normal textbook costs $200 … The prices of ebooks are 35% less than the prices of regular textbooks" (Tom). Lauren echoed the sentiments of the others and cited a specific example wherein a $175 textbook could be purchased for $30 in electronic form: "This book costs us $200. The paper version costs around $175. My electronic version was available for around $30" (Lauren).

Portability. Each participant, with the exception of Bill, identified portability as a contributing factor in their adoption of ebooks. Megan noted the physical burden placed on her students in a particular course, in which the textbook included approximately one thousand pages; students in her class frequently complained about the book's weight and likened it to a wooden log.

> The book has almost 1,000 pages; so it's heavy. All the students that I ask about the book say it weighs like a log. Once, I had them carry a hardback book and they complained that it was far too heavy. (Megan)

Tom and Lauren expressed similar sentiments, with the latter adding that ebooks alleviate the need for students to carry bulky backpacks: "The traditional textbook is usually heavy" (Tom). "Not having to carry heavy books is another good thing about ebooks" (Lauren).

Interactivity. Megan, Bill and Tom were also motivated to use ebooks in their courses based on a desire to support their students' studies with interactive features. For Megan, who teaches computer programming, the ability to make changes to ebooks afforded her flexibility in keeping textbooks up to date with current resources.

> Since I teach technology, a field in which things change rapidly, a traditional textbook may not always be up to date. Let me give you an example. When I teach Dreamweaver, I teach students how to embed YouTube videos. However, YouTube might change their instructions a week before I teach it, and so, I have to be prepared for these changes and be able to modify materials accordingly. (Megan)

Likewise, Tom mentioned interactivity as one of the critical reasons why he decided to integrate ebooks into his courses.

> Networking changes rapidly, and sometimes materials become outdated. Accordingly, I may put a note in an ebook telling students not to read a particular section, but to look at a webpage or some other supplementary material. I might also tell them to read about a topic, or watch a video explaining the same concept instead. (Tom)

Bill also mentioned that the e-reading platform allowed him to provide hyperlinks that connect students with necessary external resources. Along the same line, Lauren hoped the interactive characteristic of ebooks would support naive students' learning more effectively.

> I think it's very hard for a naive learner, the person who comes to my course for the first time, to be able to separate the major points from minor details or the first level or first order concept from the elaborations, and that's something that I can point out with ebooks containing embedding videos. (Lauren)

Current Concerns

The analysis of data from interviews with the three instructors who had already implemented the ebook-integrated curriculum into their courses for one semester suggested that they have concerns that are mostly characteristics of three stages: Personal (Stage 2), Consequences (Stage 4), and Refocusing (Stage 6). First, Bill expressed a hint of personal concern with regard to the implementation of ebook-integrated curriculum.

> I am able to collect all homework online, I can check quickly and immediately as to which problems they find difficult. And I can tailor future classes to revisit the problems they found difficult. It makes my life much easier. (Bill, Stage 2)

Regarding the stage of consequences, Bill and Megan were concerned about possible unstable network or internet problems when using ebooks in their courses. Therefore, the efforts to integrate ebooks into their courses were often useless to students' learning. "I had issues with the network being down during a quiz embedded in the ebook. There were students who said 'Oh I can't access the system'." (Bill, Stage 4) "The internet is often down, although not

for a very long time. So I had to prepare something else to teach the subject" (Megan, Stage 4).

In addition, Bill pointed out that ebook-integrated curricular practices make it difficult for him to monitor how students participated in their assessments. He sensed that some students cheated when they did online quizzes outside of the classroom: "I've got 10 online quizzes and all the quizzes last an hour. One of my students can get the quizzes done in 15 minutes. If you understood it, that would sound weird and too fast" (Bill, Stage 4).

Tom seemed to be at the highest stage delineated in the SoC in CBAM. He showed not only the stage of Consequences but also the stage of Refocusing. First, he stated how his use of ebooks with an annotation feature provided by the e-reading platform benefitted students' learning.

> I basically insert three types of annotations in the ebook. The first is a directive annotation that says "read this, don't read that" or things like "this is very important." The second type of annotation would involve questions or interpretations of the materials where I try to go beyond what's written. And then, the third type involves supplementary materials. (Tom, Stage 4)

Second, he expressed concerns over how he could improve the implementation of ebook-integrated curricular practices for students' meaningful learning experiences. For example,

> One of the things that I'm looking forward to have on the ebook platform is a feature that allows me to keep track of students' reading. So, before they come to class, I can say "Gee, did you guys actually read that?" and [have] the ability to click on [student's names] and say "Oh, you haven't read it, [but] you have." So, I ask questions to a student who hasn't read something. When they realize this, next time they will read more carefully. … I would like to see where students are, relative to the rest of the class, so if most of the class has read everything and you haven't, you might just get a tiny reminder that says, "the rest of class read this chapter; so you might want to read it." (Tom, Stage 6)

With regard to the highest concern Tom demonstrated, it is worth noticing the following accounts. During the interview, he briefly mentioned that he had used ebooks from private publishers for creating his own podcasts that were utilized outside of the classroom prior to volunteering for the A-university's ebook initiative.

> I started to use ebooks, not for this university's ebook initiative, but probably five years ago when I made podcasts for all of my classes. I recorded what I was teaching with the ebook. I posted the podcasts to Oncourse [A-university's official learning management system that students can access to get course-related resources] so that students could listen to a class if they missed it and they could go back and replay a lecture if they forgot something or were studying for an exam.

Anticipatory Concerns

The SoC framework indicates that experience plays the most critical role in advancing teachers' to the next level of concern. According to Hall (1979), concerns regarding an innovation move in a developmental progression, wherein they initially resemble those of an individual who has not adopted a particular innovation, but the concerns later become quite sophisticated as they have more experience with the innovation. However, an analysis of Lauren's interview demonstrated clear divergence from the assumption of the SoC that experience with innovation must be involved to advance the stages of concerns, corroborating the finding of Kwok (2014). Thus, it is

worthwhile to examine her concerns that emerged from the interview as a separate section of findings.

Lauren had not used ebooks in practice prior to being interviewed, although she intended to integrate an ebook into a course with a large number of students in the following semester. She nevertheless discussed the pedagogical aspects of using ebooks with a level of sophistication that coincides with the higher stages of concern, such as consequences (Stage 4). First, Lauren described how the integration of ebooks into her course could help international students overcome language barriers. Put specifically, she acknowledged the potential difficulties that ESL (English as a Second Language) or EFL (English as a Foreign Language) students might encounter in her classroom: "In a couple of courses with a high percentage of learners whose first language is not English, Google Translate enables me to very easily mark up text and translate it when students have trouble understanding."

Lauren also appreciated the interactive nature of the ebook as she could identify what questions her students may have: "Ebooks will allow students to post questions…now, that's a nice interactive feature. I have 100 students; so, I can't possibly answer all those questions but I can certainly see where the questions cluster."

However, she also feared that by using the interactive feature that allows her to highlight a text, students might infer that only those passages are important, and consequently ignore the rest of the text: "I'm worried that I might be giving too much guidance. If I were a student, I would see three pages of highlighted text and probably not read the rest."

In addition, Lauren expressed concern over students' learning with regard to possible network or internet problems, as Bill and Megan pointed out: "I think that although we have a pretty good network system, it goes down frequently. Every time the technology is down, students won't be able to access the reading material at all during class."

Likewise, she anticipated concerns about the inevitable learning curve associated with the implementation of a new technology.

> The other thing is going to be the learning curve for students as well as faculty. Most students don't know how to use ebooks. They don't know how to access them, and they don't know how to deal with it. They are going to have trouble. And I see many students knocking [on] my door to resolve their technical problems. So I think the early adopters like me are going to be dealing with the learning curve in a big way this semester.

Discussion

Drawing on SoC in CBAM, this small-scale qualitative research explores the concerns of instructors who integrated ebooks into their curricular practices as early adopters in their academic institution. The findings of this study provide valuable insights into the questions posed by Anderson (1997) about applicability of the CBAM to the "bottom-up changes initiated by the participating teachers" (p. 333) and by Straub (2009) about the concerns of teachers with "positive perceptions of innovation" (p. 636). These findings can serve as a starting point in generating discussion on the CBAM's applicability to explain change processes of teachers who initiate change independently. This study also corroborates the findings of Kwok (2014) that questioned the developmental assumptions of teachers' change processes explained by SoC in CBAM and underscored the importance of considering contextual factors to refine the model. Lastly, this study contributes to the small body of inquiry that explores in depth the experiences,

concerns, and perspectives on ebook-integrated curricular practices from teachers' points of view.

First, the four instructors' concerns expressed at the time of the interviews were varied, ranging from personal to refocusing stages. While Megan and Lauren mainly demonstrated concerns about students' learning—a feature of the consequence stage—no clear-cut profiles were found from the other instructors, as Bill and Tom demonstrated several stages of concerns concurrently. For instance, Bill expressed the stages of Personal and Consequences, while Tom showed the stages of both Consequences and Refocusing at the same time. This finding supports the claim of Bitan-Friedlander et al. (2004) that no clear-cut boundary between the stages can be found.

All four instructors pointed out high student-oriented concerns (price, portability, and interactivity) when they were asked what drove them to volunteer to integrate ebooks into their courses. This finding calls into question the assumption of SoC in which lower concerns precede higher concerns. Although Bill's appreciation of the efficiency that the ebook-integrated curricular practices brought to him was indicative of a personal concern, according to SoC in CBAM, that concern was marginal and of low intensity given that the rest of his concerns around the innovation related to students' learning. Therefore, it can be stated that the four instructors who had positive perceptions toward ebooks from the beginning of the implementation and, thus, volunteered to integrate them into their courses independently demonstrated higher stages of concerns with stronger intensity, bypassing lower stages of concerns despite their experience with the innovation having been only for a short period or not at all.

Obviously, this finding does not correspond to the developmental and sequential nature of SoC in CBAM, which suggests that the initial concerns of teachers reacting to innovation are extremely self-oriented, wherein the effectiveness of innovations is judged according to an instructor's personal needs (Hall, 1979). More specifically, Hall (1979) stated that for non-users of an innovation, "concerns about 'what the innovation is' and 'what it means for me' are relatively intense, and concerns about the impact of the innovation upon students are relatively low" (p. 204).

The concerns from Lauren challenge another facet of the developmental assumption for SoC in CBAM: experience with the innovation must be involved in order to progress toward higher stages of concerns. In fact, several studies reviewed attributed the major reason for the low stage of concern frequently observed from the participating educators to the lack of experience with the innovation and further suggested expansion of professional development opportunities that could provide the instructors with more experiences with the innovation (Hao & Lee, 2016; Rakes & Dunn, 2015; Wang, 2013). As an example, Abell and Garrett-Wright (2014) explained the reason why the majority of nurse educators who had experiences with ebooks for fewer than two years demonstrated personal concerns as follows:

> This may indicate that faculty have not had sufficient time to work through personal concerns about ebooks that would be necessary prior to being concerned about the impact on students or the ability to engage peers or collaborate in projects. (p. 114)

However, this claim cannot explain how Lauren in this study had a higher level of concerns than personal concern. Lauren did not express personal concerns with regard to the ebook integration into her courses, although she lacked experience using ebooks. She nevertheless intended to utilize them in a sophisticated manner based on sound pedagogical practices. In

other words, her staring stage on SoC of CBAM was not self concerns but impact concerns despite her insufficient time "to work through personal concerns about ebooks" (Abell & Garrett-Wright, 2014, p.114). This provides a different perspective from Abell and Garrett-Wright (2014) who argued that providing enough time for the nurse educators to have personal concerns would enable them to have higher level of concerns such as task and impact concerns.

This finding also echoes and corroborates the claim of Kwok (2014) that experience with the innovation is not a precondition in advancing the stages of concern. In his study of teachers who expressed concerns over the Liberal Studies (LS) curriculum mandated by education reform policy in Hong Kong, he found that some teachers who had had transferable experiences with similar innovation in the past demonstrated higher stages of concern such as refocusing, bypassing the lower stages of concerns. Put specifically, some teachers who experienced optional Advanced Supplementary level of Liberal Studies (AS-LS, similar to LS in terms of adopting the issue-enquiry approach) prior to the new LS curriculum could arouse high stages of concerns without going through low stages of concerns.

Like the teachers that Kwok (2014) studied, Lauren might have experiences that could be transferred to her concerns with regard to ebooks. Indeed, Lauren was among the study's most distinguished participants in terms of teaching recognition: she had won several awards for excellence in teaching, in addition to an award acknowledging her innovative teaching efforts. These achievements could indicate that she, perhaps more so than others, was accustomed to taking into consideration the pedagogical dimensions of various instructional resources. Given her extensive teaching experience and award-winning efforts, Lauren was better able to foresee potential difficulties that she and her students would encounter upon adopting ebooks and consequently she could consider how to achieve optimum results from their use.

The transferability of past experiences to new innovations was also witnessed from Tom. During the interview, Tom mentioned that he had previously used ebooks to make his own podcasts to be used outside of his classroom for students who missed the class. Tom demonstrated refocusing, the highest stage of concern in SoC, although his single semester of experience with ebook-integrated curriculum was relatively short. That Lauren's and Tom's concerns do not follow the developmental assumptions of SoC in CBAM suggests an additional contextual factor that can enhance the framework besides the three external factors (i.e. school administration, the nature of the innovation, and culture) suggested by Kwok (2014): teachers' idiosyncratic characteristics, such as the extent to which an instructor has reflected on pedagogical practices in light of their teaching experience or has had experiences that are transferable to the target innovation. In other words, deep reflection on pedagogical practices could play a significant role in reaching a more sophisticated stage of concern regardless of the frequency of experiencing the target innovation.

These findings support the notion that change cannot be realistically generalized according to a particular theory or model, reminding us of the complex nature of the process of teacher change (Kim & McMullen, 2012; Kwok, 2014). The framework can be improved by addressing interactions between the stages of concerns and unique teacher characteristics.

Limitations

The purpose of this study is not to generalize findings, but to describe participants' lived experiences in order to facilitate a theoretical discussion based on empirical evidence. Hence, caution should be exercised when drawing inferences from it because of the following

limitations. First, the sample size was small, and although the samples were drawn from randomly selected departments, only four participants were included, and they were not randomly selected. Therefore, the diverse nature of higher education instructors in various settings may not have been adequately captured or represented.

Second, the participants were affiliated with the same university, and thus generalizations that extend to other higher education settings are potentially ambiguous. Third, the data gathered for Lauren did not include information about whether she had experiences of integrating any types of technology other than ebooks prior to the time of interview. Therefore, it could be possible that her experiences with other types of technology integration were transferred to her concerns about the ebook-integrated curriculum. However, this does not negate the claim that experience with the target innovation is not a precondition in arousing high levels of concerns.

Despite these limitations, the study's findings should enable scholars who focus on teacher education and the professional development of faculty members, as well as higher education policymakers, to empower instructors to actively adopt innovations.

Conclusion

This study revisited the developmental assumption of SoC in CBAM and suggested individual teachers' idiosyncratic characteristics as another facet of the contextual factors suggested by Kwok (2014) to be considered in the model to address the concerns of teachers who initiate change independently. The concerns shared by the four instructors in this study confirm that the SoC in CBAM is limited in its ability to fully explain the change process of instructors who attempt to adopt innovations independently, challenging the generalization of developmental progress through stages of concerns. The cases of Tom and Lauren in particular highlighted the importance of considering relevant experiences with the innovation and deep pedagogical reflection, while the cases of all four instructors demonstrated the critical role of their positive preferences towards the innovation in enhancing CBAM so as to account for changes in teacher concern related to independently-adopted innovations. It is suggested that further research is necessary to explore more idiosyncratic traits that might promote or hinder teachers' change processes toward either mandated or initiated innovation and the ways the traits interact with external contextual factors.

References

Abell, C. H., & Garrett-Wright, D. (2014). E-Books: Nurse faculty use and concerns. *Nursing education perspectives, 35*(2), 112-114.

Anderson, S. E. (1997). Understanding teacher change: Revisiting the concerns based adoption model. *Curriculum Inquiry, 27*(3), 331-367.

Baruch, A., & Avidov-Unger, O. (2014). Measures for ICT implementation in colleges of education. In J. Herrington, J. Vitell, & M. Leikomaa (Eds.), *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications* (pp. 1521-1529). Waynesville, NC: Association for the Advancement of Computing in Education.

Bazeley, P. (2006). Research Dissemination in Creative Arts, Humanities and the Social Sciences. *Higher Education Research and Development, 25*(3), 307-321.

Bitan-Friedlander, N., Dreyfus, A., & Milgrom, Z. (2004). Types of "teachers in training": The reactions of primary school science teachers when confronted with the task of implementing an innovation.

Teaching and Teacher Education, 20(6), 607-619.
Blackwell, C. K., Lauricella, A. R., Wartella, E., Robb, M., & Schomburg, R. (2013). Adoption and use of technology in early education: The interplay of extrinsic barriers and teacher attitudes. *Computers & Education, 69*, 310-319.
Brenner, A. M., & Brill, J. M. (2016). Investigating practices in teacher education that promote and inhibit technology integration transfer in early career teachers. *TechTrends, 60*(2), 136-144.
Bush, V. (1945). As we may think. *The Atlantic, 176*(1). 101-108.
Carlock, D. M., & Maughan Perry, A. (2008). Exploring faculty experiences with e-books: A focus group. *Library Hi Tech, 26*(2), 244-254.
Cassidy, E. D., Martinez, M., & Shen, L. (2012). Not in love, or not in the know? Graduate student and faculty use (and non-use) of e-books. *The Journal of Academic Librarianship, 38*(6), 326-332.
Chamblee, G., Slough, S., & Wunsch, G. (2008). Measuring high school mathematics teachers' concerns about graphing calculators and change: A yearlong study. *Journal of Computers in Mathematics and Science Teaching, 27*(2), 183-194.
Cheung, D., Hattie, J., & Ng, D. (2001). Reexamining the stages of concern questionnaire: A test of alternative models. *The Journal of Educational Research, 94*(4), 226-236.
Cheung, D., & Yip, D. Y. (2004). How science teachers' concerns about school-based assessment of practical work vary with time: the Hong Kong experience. *Research in Science & Technological Education, 22*(2), 153-169.
Christou, C., Eliophotou-Menon, M., & Philippou, G. (2004). Teachers' concerns regarding the adoption of a new mathematics curriculum: An application of CBAM. *Educational Studies in Mathematics, 57*(2), 157-176.
Choctaw, W. T. (2016). *Transforming the patient experience: A new paradigm for hospital and physician leadership*. Springer International Publishing.
Culp, K. M., Honey, M., & Mandinach, E. (2005). A retrospective on twenty years of education technology policy. *Journal of Educational Computing Research, 32*(3), 279-307.
Daniel, D. B., & Woody, W. D. (2013). E-textbooks at what cost? Performance and use of electronic v. print texts. *Computers & Education, 62*(2013), 18-23.
Davis, N. E., & Roblyer, M. D. (2005). Preparing teachers for the "Schools That
Technology Built": Evaluation of a program to train teachers for virtual schooling. *Journal of Research on Technology in Education, 37*(4), 399-409.
Davies, R. S., & West, R. E. (2014). Technology integration in schools. In J. M. Spector, M. D. Merrill, J. Elen, & M. J. Bishop (Eds.), *Handbook of research on educational communications and technology* (pp. 841-853). New York: Springer.
Dobbs, R. L. (2004). Impact of training on faculty and administrators in an interactive television environment. *Quarterly Review of Distance Education, 5*(3), 183-194.
Ertmer, P. A., & Ottenbreit-Leftwich, A. T. (2010). Teacher technology change: How knowledge, confidence, beliefs, and culture intersect. *Journal of research on Technology in Education, 42*(3), 255-284.
Finley, L., & Hartman, D. (2004). Institutional change and resistance: Teacher preparatory faculty and technology integration. *Journal of technology and teacher education, 12*(3), 319.
Fraenkel, J. R. & Wallen, N. E. (2009). How to design and evaluate research in education. New York: McGraw-Hill.
Fuller, F. F. (1969). Concerns of teachers: A developmental conceptualization. *American Educational Research Journal, 6*(2), 207-226.
George, A. A., Hall, G. E., Stiegelbauer, S. M., & Litke, B. (2008). *Stages of concern questionnaire*. Austin: Southwest Educational Development Laboratory.
Glaser, B. G. (1965). The constant comparative method of qualitative analysis. *Social Problems, 12*(4), 436-445.

Glaser, B. & Strauss, A. (1967). *The discovery of grounded theory: Strategies for qualitative research*. London: Wiedenfeld and Nicholson.
Hao, Y., & Lee, K. S. (2015). Teachers' concern about integrating Web 2.0 technologies and its relationship with teacher characteristics. *Computers in Human Behavior, 48*, 1-8.
Hall, G. E. (1979). The concerns-based approach to facilitating change. *Educational Horizons, 57*(4), 202-208.
Hall, G. E., & Hord, S. M. (1987). *Change in schools: Facilitating the process*. Albany, NY: State University of New York Press.
Hall, G. E., & Hord, S. M. (2011). *Implementing change: Patterns, principles and potholes*. Boston: Pearson.
Hall, G., Wallace, R., & Dossett, W. (1973). A developmental conception of the adoption process within educational institutions (Report No. 3006). Austin: The University of Texas at Austin. *Research and Development Center for Teacher Education*.
Hernon, P., Hopper, R., Leach, M. R., Saunders, L. L., & Zhang, J. (2006). E-Book use by Students: Undergraduates in Economics, Literature, and Nursing. *The Journal of Academic Librarianship, 33*(1), 3-13.
Hew, K. F., & Brush, T. (2007). Integrating technology into K-12 teaching and learning: Current knowledge gaps and recommendations for future research. *Educational Technology Research and Development, 55*(3), 223-252.
Holland, P. E. (2001). Professional development in technology: Catalyst for school reform. *Journal of Technology and Teacher Education, 9*(2), 245-268.
Huang, Y. M., Liang, T. H., Su, Y. N., & Chen, N. S. (2012). Empowering personalized learning with an interactive e-book learning system for elementary school students. *Educational Technology Research and Development, 60*(4), 703-722.
Inan, F. A., & Lowther, D. L. (2010). Factors affecting technology integration in K-12 classrooms: A path model. *Educational Technology Research and Development, 58*(2), 137-154.
Jones, T., & Brown, C. (2011). Reading Engagement: A Comparison between E-Books and Traditional Print Books in an Elementary Classroom. *Online Submission, 4*(2), 5-22.
Johnson, L., Levine, A., Smith, R., & Stone, S. (2010). *The 2010 Horizon Report*. Austin, TX: New Media Consortium
Kim, C., Kim, M. K., Lee, C., Spector, J. M., & DeMeester, K. (2013). Teacher beliefs and technology integration. *Teaching and Teacher Education, 29*, 76-85.
Kim, Y. & MuMullen, M. B. (2012). Evolving concept of the child in early childhood education curriculum theories: Challenging dominant assumptions about "best" practice. *The Sophist's Bane*. *6*(1), 14-20.
Kwok, P. W. (2014). The role of context in teachers' concerns about the implementation of an innovative curriculum. *Teaching and Teacher Education, 38*, 44-55.
Larson, L. C. (2010). Digital readers: The next chapter in e-book reading and response. *The Reading Teacher, 64*(1), 15-22.
Leech, N. L., & Onwuegbuzie, A. J. (2011). Beyond constant comparison qualitative data analysis: Using NVivo. *School Psychology Quarterly, 26*(1), 70-84.
Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Newbury Park, CA: Sage.
Lochner, B., Conrad, R. M., & Graham, E. (2015). Secondary Teachers' Concerns in Adopting Learning Management Systems: A US Perspective. *TechTrends, 59*(5), 62-70.
Martin, K., & Quan-Haase, A. (2013). Are e-books replacing print books? Tradition, serendipity, and opportunity in the adoption and use of e-books for historical research and teaching. *Journal of the American Society for Information Science and Technology, 64*(5), 1016-1028.
Miles, M. B., Huberman, A. M., & Saldana, J. (2013). *Qualitative data analysis: A methods sourcebook* (3rd ed.). Thousand Oaks, CA: SAGE Publications.
Nelson, M. R. (2008). E-books in higher education: nearing the end of the era of hype? *Educause Review,*

43(2). Retrieved from http://www.educause.edu/ero/article/e-books-higher-education-nearing-end-era-hype

Palak, D., & Walls, R. T. (2009). Teachers' beliefs and technology practices: A mixed methods study. *Journal of Research on Technology in Education, 41*(4), 417-441.

Priestley, M., Edwards, R., Priestley, A., & Miller, K. (2012). Teacher agency in curriculum making: Agents of change and spaces for manoeuvre. *Curriculum Inquiry, 42*(2), 191-214.

Rakes, G. C., & Dunn, K. E. (2015). Teaching online: Discovering teacher concerns. *Journal of Research on Technology in Education, 47*(4), 229-241.

Rakes, G., Dunn, K., & Rakes, T. (2015). Preservice K-12 teachers' concerns regarding teaching online. In D. Rutledge & D. Slykhuis (Eds.), *Proceedings of Society for Information Technology & Teacher Education International Conference* (pp. 1023-1026). Waynesville, NC: Association for the Advancement of Computing in Education

Rienties, B., Giesbers, B., Lygo-Baker, S., Ma, H. W. S., & Rees, R. (2016). Why some teachers easily learn to use a new virtual learning environment: A technology acceptance perspective. *Interactive Learning Environments, 24*(3), 539-552.

Rogers, Y., Connelly, K., Hazlewood, W., & Tedesco, L. (2010). Enhancing learning: a study of how mobile devices can facilitate sensemaking. *Personal and Ubiquitous Computing, 14*(2), 111-124.

Saunders, R. (2012). Assessment of professional development for teachers in the vocational education and training sector: An examination of the concerns based adoption model. *Australian Journal of Education, 56*(2), 182-204.

Saunders, R. (2013). The role of teacher emotions in change: Experiences, patterns and implications for professional development. *Journal of Educational Change, 14*(3), 303-333.

Sanders, M., & Ngxola, N. (2009). Addressing teachers' concerns about teaching evolution. *Journal of Biological Education, 43*(3), 121-128.

Shin, S. (2014). E-book usability in educational technology classes: Teachers and teacher candidates' perception toward e-book for teaching and learning. *International Journal of Distance Education Technologies (IJDET), 12*(3), 62-74.

Stes, A., De Maeyer, S., Gijbels, D., & Van Petegem, P. (2012). Instructional development for teachers in higher education: Effects on students' perceptions of the teaching–learning environment. *British Journal of Educational Psychology, 82*(3), 398-419.

Strauss, A., & Corbin, J. (1994). Grounded theory methodology. In N. K. Denzin & Y. S Lincoln (Eds.), *Handbook of qualitative research* (273-285). Thousand Oaks, CA: Sage.

Straub, E. T. (2009). Understanding technology adoption: Theory and future directions for informal learning. *Review of Educational Research, 79*(2), 625-649.

van den Berg, R., Sleegers, P., Geijsel, F., & Vandenberghe, R. (2000). Implementation of an innovation: Meeting the concerns of teachers. *Studies in Educational Evaluation, 26*(4), 331-350.

Wang, W. (2013). Teachers' stages of concern and levels of use of a curriculum innovation in China: A case study. *International Journal of English Language Teaching, 1*(1), 22-31.

Waters, J., Roach, J., Emde, J., McEathron, S. R., & Russell, K. (2014). A Comparison of e-book and print book discovery, preferences and usage by science and engineering faculty and graduate students at the University of Kansas. Retrieved from https://kuscholarworks.ku.edu/handle/1808/12537

Wong, P. M., & Cheung, A. (2015). The adoption features of government initiatives for the Curriculum Reform in Hong Kong schools. *Educational Management Administration & Leadership, 43*(5), 828-849.

Yang, M. Y., Kim, H. N., Kim, E. J., & Kim, D. H. (2013). An analysis on elementary school teachers' concern and implementation of differentiated instruction of mathematics. *Journal of Fisheries and Marine Sciences Education, 25*(2), 321-340.

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