

“But What If I Fail?” A Meta-Synthetic Study of the Conditions Supporting Teacher Innovation

Sally Holdsworth
Nipissing University

Nancy Maynes
Nipissing University

Abstract

This meta-synthesis investigates the conditions that support teacher innovation in schools. Twenty-seven articles that report on studies using a combination of qualitative and quantitative methodology were selected for this analysis. The articles were analyzed using Hargreaves’s and Fullan’s concept of “professional capital” as a framework, and nine emergent themes were developed. Most significant among the themes were the impact of teacher attitudes and beliefs, and the importance of school structure on how teachers initiated and sustained innovations in teaching practice. This research is limited by the ability to generalize results. This limitation is due to the variety of methodologies and sample sizes employed by studies used for the meta-synthesis. This article offers a

discussion of the importance of local adaptation in supporting teachers to develop and sustain innovations that lead to positive school change.

Keywords: teacher innovation, professional capital, meta-synthesis

Résumé

Cette méta-synthèse porte sur les conditions qui favorisent l'innovation dans les écoles de la part des enseignants. Vingt-sept articles sur des études faisant appel à une combinaison de méthodes qualitatives et quantitatives ont été choisis pour cette analyse. Le concept de « capital professionnel » de Hargreaves et Fullan a servi de cadre pour l'analyse des articles, à la suite de quoi neuf thèmes ont émergé, notamment l'impact des attitudes et des croyances des enseignants et l'importance de la structure de l'école sur la manière dont les enseignants s'y prennent pour lancer et maintenir des innovations dans leurs pratiques pédagogiques. Cette recherche est limitée par la capacité de généraliser les résultats et ce, en raison de la variété des méthodologies et de la taille des échantillons employées dans les études faisant partie de la méta-synthèse. Dans cet article, les auteures discutent de l'importance des aménagements locaux qui aident les enseignants à développer et à mettre en œuvre des innovations qui entraînent des changements positifs à l'école.

Mots-clés : innovation de la part des enseignants, capital professionnel, méta-synthèse

Introduction

To examine how schools and teachers initiate and sustain innovative practices (Hargreaves, 2004), this study involved a meta-synthesis of research studies which investigated the conditions needed to support true innovation; innovation which is both authentic and sustainable. Ironically, while pedagogy is moving toward a more individualized, student-centred approach, professional development in some jurisdictions (e.g., the United States) in the last two decades has become increasingly prescriptive and standardized, thereby minimizing overt confidence in the professional skills of the teaching profession (Darling-Hammond, Wei, Andree, Richardson, & Orphanos, 2009). The meta-synthesis that forms the basis for this study focused on examining current research about factors that contribute to creating a culture of innovation among teachers with the intention of providing a direction for future thought about school orientation and policy as it relates to ongoing professional learning and professional practice for teachers.

The Importance of Innovation

As a primary function, schools exist to enable students to achieve learning goals. In order to do this, educational institutions dedicate themselves to constant improvement, using data and best practices to increase the effectiveness and quality of instruction and learning programs offered (Earl & Katz, 2006; Hattie, 2011). As a public institution, schools are beholden to an insecure public, which demands evidence of efficacy (McNamara & O'Hara, 2004). The drive to meet these demands results in near constant change, as all levels of education adapt to achieve what is deemed necessary for student success. These often top-down shifts come in many forms—structure, methodology, pedagogy—but all are seeking to standardize practice and to provide evidence that the quality of the educational experience is improving for students (Hargreaves, 2004; Hattie, 2011). Even as standardization increases, however, so does the evidence from educational theorists that the most effective agent of change for students is, in fact, the classroom teacher (Hargreaves & Fullan, 2012; McKenzie, Santiago, Sliwka & Hiroyuki, 2005).

In a study of the process of improvement in 20 school systems from around the world, The McKinsey Report noted that system improvement “ultimately comes down to improving the learning experience of students in their classrooms” (Mourshed, Chijioke,

& Barber, 2010, p. 3). In the quest for measurable improvement by higher levels of government administration, however, this key factor is frequently ignored. Tschannen-Moran (2009) points to contrasting rationales of educational reform: on one hand, in the move toward “greater standardization of work processes, such as ‘teacher proofing’ the curriculum; on the other, in the move toward professional development and coaching as coordinating mechanisms” (p. 220). McNamara and O’Hara (2004) argue that while there is increasing pressure to “reduce teaching to merely implementing a ‘proven’ programme of instruction” (p. 468), the literature and scholarship of school improvement has increasingly stressed that student learning is directly related to the quality of teacher learning. According to these studies, supporting teachers to become the initiators of innovation rather than passive receivers is a key to understanding the improvement of educational practices in schools.

Teachers often feel either ill-equipped to handle new initiatives, or reluctant to employ new methodologies, which they judge to be unsound (Hargreaves, 2004). This creates a vicious cycle: new policies which, inadequately supported or poorly implemented, do not result in the immediate success their creators hoped for, are then scrapped and new methods proposed, with teachers being blamed for their unwillingness to try something new. In education, this has caused what Abrahamson (2004) calls *repetitive change syndrome*, where “hardly anyone knows which change they’re implementing and why” (p. 3). In his study about the emotional response of teachers to change, Hargreaves (2004) concluded that emotional responses reported by teachers to mandated reforms are consistently negative, while teachers were overwhelmingly enthusiastic and animated about their experiences of self-initiated change, even when teachers described self-initiated changes as fraught with “inherent difficulties, inner doubts and external resistance as they struggled to make their initiative succeed” (Hargreaves, 2004, p. 300). In another study, Stam, Miedema, Onstenk, Wardekker, and ten Dam (2014) also found self-initiated innovation to be a struggle, and an “energy consuming, emotional, and painful process” (p. 263). Hargreaves (2004) recognized that teachers are involved in research about their practice each teaching day, and concluded that, even if it is challenging, each new initiative must engage the knowledge and professional judgement of teachers in order to ensure success (see also Boyer, 1997; Sherrington, 2014).

Theoretical Framework

While education and business have often shared an uneasy relationship, the concept of professional capital explored by Hargreaves and Fullan in their 2012 book, *Professional Capital: Transforming Teaching in Every School*, pulls concepts from the language of economics and applies them to school improvement and teacher innovation. As Hargreaves and Fullan argue, the acceptance of teachers as sources of professional capital in education acknowledges the importance of teacher skill, technical knowledge, and methodological expertise. The belief in teachers as knowledgeable professionals and agents of change offers a way to understand how greater outcomes in the area of student achievement can be realized through increased support of teacher innovation. This approach is consistent with the scholarship of teaching and learning introduced by Boyer (1997) in its recognition of teacher professionalism. Hargreaves and Fullan (2012) discuss the three kinds of capital that make up professional capital (human capital, social capital, and decisional capital), which provide a useful structure for examining studies that address the factors that foster innovation in schools and among teachers.

Teaching and schooling are social endeavours. Vygotsky proposed a theory of development—sociocultural theory—that emphasizes the importance of a social context in learning and development (John-Steiner & Mahn, 1996), positing learning as a uniquely social endeavour, in which knowledge is co-created by members of a society within a distinct cultural and historical context (John-Steiner & Mahn, 1996). If learning is a constant dialectic, then sociocultural theory can provide a way to view teaching and learning as an ongoing event, one which is constantly shifting, making it even more important to create a structure for self-regulation and individualized innovation. The emphasis on the social, interactive, and emerging nature of professional educational practice embraced by both of these perspectives provides a useful lens through which to examine the diverse factors that serve to foster and sustain teacher innovation.

Review of the Literature

By examining the three types of capital—human, social, and decisional—within a school, Hargreaves and Fullan offer a way to investigate the strengths and challenges faced by educators within a complex social setting. Human capital is described by Hargreaves and

Fullan (2012) as “the qualities of the individual, their qualifications and competencies on paper” (p. 37), recognizing that the individual qualities of a teacher often determine the impact a teacher has in the classroom (Hargreaves, 2004). In a study of teaching and teacher policy in 25 member countries around the world, the Organization for Economic Cooperation and Development (OECD) determined that teachers are primarily motivated by the intrinsic value of teaching—making a contribution to society through the development of their students (McKenzie et al., 2005). Similarly, Ali (2011) studied innovation-oriented teachers and concluded that change efforts by these teachers were motivated by the “conception of their role as teachers, [and by] their sense of commitment to their students” (p. 1635). Emo (2015) determined that when teachers perceive a positive outcome of a change, they are willing to take the risks inherent in innovation. Davies (2013) agreed, citing positive student response as a key factor for teachers in the initiation of change in the classroom. Zehetmeier (2015) describes the outcome of effective, teacher-initiated change on students as a “virtuous circle”; in a positive school environment, factors fostering innovation “led to impact, which led to fostering factors, which led to impact” (p. 125). Each of these studies highlights that human capital within school systems is developed and maintained in the same way that teachers support students—by developing confidence and supporting positive outcomes.

Teachers with high human capital engage emotionally with their students, and invest of themselves when planning and implementing innovations (Hargreaves, 2004). In an effective classroom, teachers are authentic participants in the process of learning, and engage emotionally with their students (Hatt, 2005); Hatt refers to this concept as pedagogical love. This type of vulnerability can engender discomfort on the part of the teacher (Lasky, 2005), but ultimately, students respect and understand that teachers who take risks affirm their own incompleteness and their willingness to learn together (Greene, 1986). Noddings (2012) calls this the “ethic of care,” and asserts that the “ethic of care binds ‘carers’ and ‘cared-fors’ in relationships of mutual responsibility” (p. 235). This is closely tied to Freire’s (1970) belief that serious education should also acknowledge the authentic emotional bonds of teaching and learning, and hooks’ (2003) assertion that teaching itself is an act of love in which teachers and students see each other as complex whole people engaged in a mutual pursuit of knowledge and understanding.

What is unclear from the literature on relationality is how the characteristics of human capital directly influence how and why teachers decide to undertake and sustain

innovations in their own practice. While teachers may feel open and emotionally present with their students, they may not be willing to take risks that might make them professionally vulnerable (Lasky, 2005). Abrami, Poulsen, and Chambers (2004) found that the most significant factor in teachers undertaking a new initiative was the expectation of success (p. 211). In her case study of an innovative project at an Ontario secondary school, Raksit (2006) recognized that innovations take place within a wider context and the support or criticism of their efforts by administration can affect teachers' decisions to make change. A greater understanding of this may lie in the second component of professional capital described by Hargreaves and Fullan (2012): social capital.

Social capital refers to the collaborative power of the group. While an individual teacher might demonstrate human capital in his/her own practice, it is social capital that allows teachers to bring professional skills and abilities to a larger collective. Pil and Leana (2009) argue that current reform efforts that focus primarily on the role of administrators as instructional leaders, and bring in outside experts to fix the system, have been largely ineffective in accomplishing sustainable improvement in education. They found that in schools where teachers reported high social capital, student achievement increased, mentorship flourished, and new or struggling teachers gained skills and improved confidence. Collaboration has been identified as one of the key social capital skills for the 21st-century workplace (Ontario Ministry of Education, 2014; Starko, 2013) where learning is experienced socially (John-Steiner & Mahn, 2008; Sawyer et al., 2003) and innovation often involves a social aspect and is a collaborative pursuit (Amabile, 2006; Sawyer, 2007; Starko, 2013). Amabile and Pillemer (2012) found that collaboration in the workplace fosters a broader exchange of ideas and abilities. Hargreaves and Fullan (2013) described this as “us[ing] the group to change the group” (p. 37). In the traditional school environment, teachers are frequently isolated in classrooms as a result “of an ‘egg crate’ model of instruction” (Darling-Hammond et al., 2009), limiting opportunities for collaboration. Also, the use of high-stakes standardized test scores and credit acquisition data as methods of rating teacher effectiveness have resulted in a hunkering-down mentality for many educators, at the same time as expectations for collaboration have increased (Tschannen-Moran, 2014). This response may be a logical way to address the connection being made between student achievement and teacher effectiveness. For example, Bergin (2015) makes this argument:

The purpose of evaluating teaching effectiveness is to increase student learning. A common metric of student learning is achievement data (i.e., test scores). Thus, it is logical to use student achievement data to evaluate teaching effectiveness. (p. i)

This link may seem less causal than the argument made by Bergin when the complexities of personality, motivation, teacher seniority, attribution errors, and socio-economic indicators are considered (Braun, 2005) but it also seems logical that such connections between student achievement and attempts to measure teacher effectiveness using these data may impact teachers' willingness to risk innovation.

Research findings (Bryk & Schneider, 2003; Leithwood, Patten & Jantzi, 2010; Tschannen-Moran, 2009, 2014) have directly linked the willingness of school faculty to collaborate with each other to the sense of trust within their organization. It seems evident from these studies that relational trust supports the structure of social capital by seeing educators as professionals and valuing their input in supporting collaborative inquiry and innovation.

The third component of Hargreaves and Fullan's (2012) concept of professional capital is decisional capital—how an individual develops capabilities over time; in particular, the ability to use informed and evidence-based judgement, which balances risk-taking with measured, informed action. Professional learning is a significant part of building decisional capital and has been directly linked to student-achievement gains (Darling-Hammond et al., 2009). Research overwhelmingly supports the efficacy of ongoing teacher learning as a self-directed, collaborative process in which teachers use their professional knowledge to determine the strategies that will best serve student achievement (Hargreaves, 2004). Teachers can also look to professional learning as practical, job-embedded opportunities to discover challenges and seek solutions in a collaborative environment (Darling-Hammond et al., 2009). Reflective of this approach, the Ontario College of Teachers supports the “complex, holistic, interrelated, self-directed, contextual and evolving nature of relevant and meaningful ongoing professional learning” (Ontario College of Teachers, 2015). Indeed, many educational innovations have failed because the need for teacher learning was not acknowledged or understood (King, 2014; Vermunt & Endedijk, 2011). Vermunt and Endedijk (2011) found that teachers need extended learning opportunities that are collaborative and supported in order to sustain long-term innovation. Understanding professional learning as a “complex process involving the

interconnectedness and interdependency of teacher agency” (King, 2014, p. 103) is essential to creating the conditions necessary to build decisional capital within a school community and involve teachers in classroom inquiry and action research (Creswell, 2012).

In some schools, this approach may exist in professional learning communities (PLCs), groups of professionals who come together within a school or a region to develop initiatives or approaches to address specific challenges, or explore particular areas of professional learning (Davies, 2013; Owen, 2015) and establish collaborative networks among teachers (Aubusson, Steele, Dinham, & Brady, 2007; Davies, 2013; Frank, Zhao, Penuel, Ellefson, & Porter, 2011; Owen, 2015). PLCs that are teacher-driven can lead to significant collegiality and professional learning (Little, 2002). However, it must be recognized that sometimes PLCs can inadvertently equate change with improvement, particularly when the demand for change is motivated by outside initiatives, rather than based on priorities from within the learning community (Elementary Teachers Federation of Ontario, 2007; Little, 2002). There is strong evidence that distributing, or sharing, leadership within a school can achieve real results for the entire community through the development of increased decisional capital (Harris, 2007; Leithwood, Patten, & Jantzi, 2010; Leithwood & Strauss, 2009). Research confirms that if leadership is distributed, then so is responsibility, which seems to result in the creation of a stronger sense of community and collective purpose within the school (Copland, 2001).

In the following sections, research findings from studies that connect the concept of professional capital with teacher innovation are considered to develop a better understanding of how teachers and schools have supported innovation using the three components of professional capital. Through an analysis and discussion of the interpretive findings of multiple studies, this meta-synthesis will offer some insight into how schools can foster the conditions necessary to support self-initiated and sustainable innovation by teachers in a school community.

Defining Innovation

The word innovation is often used to describe a change that is new or different from the status quo. This study used the interpretation advanced by Emo (2015), who defines innovation as “those initiatives which are new to those who introduce them” (p. 172). Initially,

the meta-synthetic analysis was approached with a distinction between those innovations which were self-initiated, and those which were determined or compelled by an external motivation. However, through the course of the research, it became clear that this was not a helpful differentiation, as the studies confirmed that teacher innovations are inspired by a complex mix of top-down and bottom-up processes (Stam et al., 2014). It was apparent that an innovation that was new to the individual was often the result of a variety of influences. For example, an innovative practice could be modelled on something they read, heard from colleagues, or experienced during a professional learning opportunity (Emo, 2015). This understanding of innovation as a new process for the individual who implements it connects well to the framing concepts of this study—professional capital, which contends that teachers are professionals with the knowledge and judgement to make decisions pertaining to their instructional practices (Hargreaves & Fullan, 2012), and sociocultural theory, which views all learning as a social endeavour, which affects and is affected by contextual factors (John-Steiner & Mahn, 1996). In this study, the term innovation defines a practice that is new to the individual who implements it based on the individual's assessment of need and efficacy, even if the practice is already in place in other contexts or being used by other educators.

Research Questions

Education is understood as a means of improvement—self-improvement and the improvement of society at large (Fullan, 2006), including the improvement of professional practice. Therefore, guiding research questions for this study included:

- Why are teachers motivated to undertake and sustain self-initiated innovation?
- What conditions support teachers to innovate their practice?
- How do schools support teacher resiliency when facing the challenges of self-initiated change?

This study, therefore, examined the conditions necessary to support teachers to take risks and develop innovative practices, using meta-synthesis methodology.

Methodology

This study involved a qualitative meta-synthesis of articles reporting current research studies related to this topic. Meta-synthesis is similar to the meta-analytic technique, but was developed as a methodology to summarize research from qualitative studies (Creswell, 2012). Meta-analysis draws conclusions specifically from the data accumulated from multiple studies, and offers new analytical results based on the broader picture offered by these data. However, a meta-synthesis approach focuses primarily on the collected findings of existing studies rather than the data alone, yet goes beyond the traditional literature review, which typically provides a summary and foundation of knowledge on a particular topic. While a literature review can offer an overview of research in a particular field, it is not considered an adequately critical and rigorous examination of research findings to offer a new perspective or research direction (Chenail, 2009).

In contrast, meta-synthesis seeks to develop new knowledge based on existing qualitative research with the purpose of building a new or fuller understanding of a phenomenon, or possibly the development of new theory (Aspfors & Fransson, 2015; Thorne et al., 2002) and was developed in response to the increased acceptance of qualitative studies as offering a vital perspective on specific issues and areas of policy development (Chenail, 2009). Meta-synthesis is primarily concerned with the interpreted results and outcomes of a study, rather than its scientific or statistical data. In keeping with socio-cultural theory, which sees knowledge as contextual and co-created, the meta-synthetic approach seeks to maintain the integrity of the interpretative findings of each study while recognizing that the findings of multiple studies can be collected, summarized, and integrated into common thematic categories for overall analysis (Chenail, 2009; Noblit & Hare, 1988), in order to provide further understanding of related concepts (Beck, 2003) and useful information for evidence-based decision-making (Sandelowski, Docherty, & Emden, 1997).

Despite the lack of a commonly accepted meta-synthetic procedure, some researchers have proposed frameworks and conceptual guidelines, which can be very helpful to researchers. One example is meta-ethnography (Noblit & Hare, 1988), in which the researcher examines previous studies and “translates them into one another” (p. 319) through common metaphors based on the interpretive data in each study (Scruggs, Mastropieri, & McDuffie, 2007; Beck, 2003). Compared to a meta-analysis, the sample size

used for a meta-synthesis is small, so statistical instruments are rarely used. As a result, researchers can treat each study with more focused attention, allowing each one to stand as a distinct part of the research (Sandelowski et al., 1997), guided by approaches that help avoid bias (Sandelowski, Voils, & Barroso, 2007).

Meta-Synthesis Search Methodology

This project used three primary ways of locating studies for the meta-synthesis: keyword search, expert suggestion, and bibliographic investigation. To begin, available databases were searched using keyword search techniques, including the Nipissing University e-library:

- a. Education Research Complete
- b. ERIC (EBOSCO host)
- c. CBCA Education

The terms “innovation” and “teacher” or “teaching” provided starting points for the search. Additionally, the search term “self-initiated” was used to narrow the search results considerably. Adding the term “school” offered some studies that explored innovative programs that were adopted on a school-wide basis. Some of these were useful as they described or included information about why individual teachers chose to participate and why such programs may have influenced innovation. Because of an inadequate search return from these few keywords, terms branching out from the main topic were added, which included “teacher learning,” “teacher creativity,” “professional development,” and “collaboration,” and some of the searches including the words “sustainable” and “support/ing” were redone with combinations of the above keywords. This search yielded 23 studies. Of these, four were eliminated following the reading of the abstracts. This was not because of concerns with methodology, but because the innovations reported were not in any way associated with teacher initiation, and instead were imposed programs in which teachers were obliged to participate. For this reason, these studies could not be considered topically similar to the research questions.

Expert suggestions were also used as a way to expand the list of studies. If these experts had used the research and if the study seemed topically similar to the current research concerns, a search was performed using the Nipissing University e-Library or

Google Scholar in order to find these studies and read their abstracts. Searching specific authors was also useful, to enable locations of other studies documented by experts in this field of inquiry. In this way, another seven studies were added to the meta-synthetic sample. The final, and perhaps least rigorous form of searching, was through a direct bibliographic search. Using studies that were chosen as effective research materials for the meta-synthesis and other supporting documents, bibliographies and reference sections were examined, and some articles were isolated, based primarily on their titles, if they seemed as if they could hold some relevance to this study. The combination of these search methods yielded 27 studies that met the criteria for inclusion in this meta-synthesis. Participant and methodology details for each of the studies are included in the Appendix.

Inclusion and Exclusion Criteria

Several inclusion criteria were specifically considered as decisions were made to include or exclude each study. Each study that was chosen was published in a recognized and peer-reviewed journal, ensuring a level of methodological acceptability. Secondly, any articles published before the year 2000 were excluded. Next, though the included studies document research from all over the world, any articles that were not published in an English language journal were excluded. Finally, the decision to include mixed-method studies provided access to additional studies. While several of the chosen studies included some aspect of quantitative data collection, all of the mixed-method studies that were selected included a discussion of the quantitative findings, which is consistent with the interpretive nature of an exclusively qualitative study. In these cases, the quantitative research results are used in combination with the qualitative findings and serve to support, and/or enhance, the understanding gained through the qualitative data collection (Figure 1).

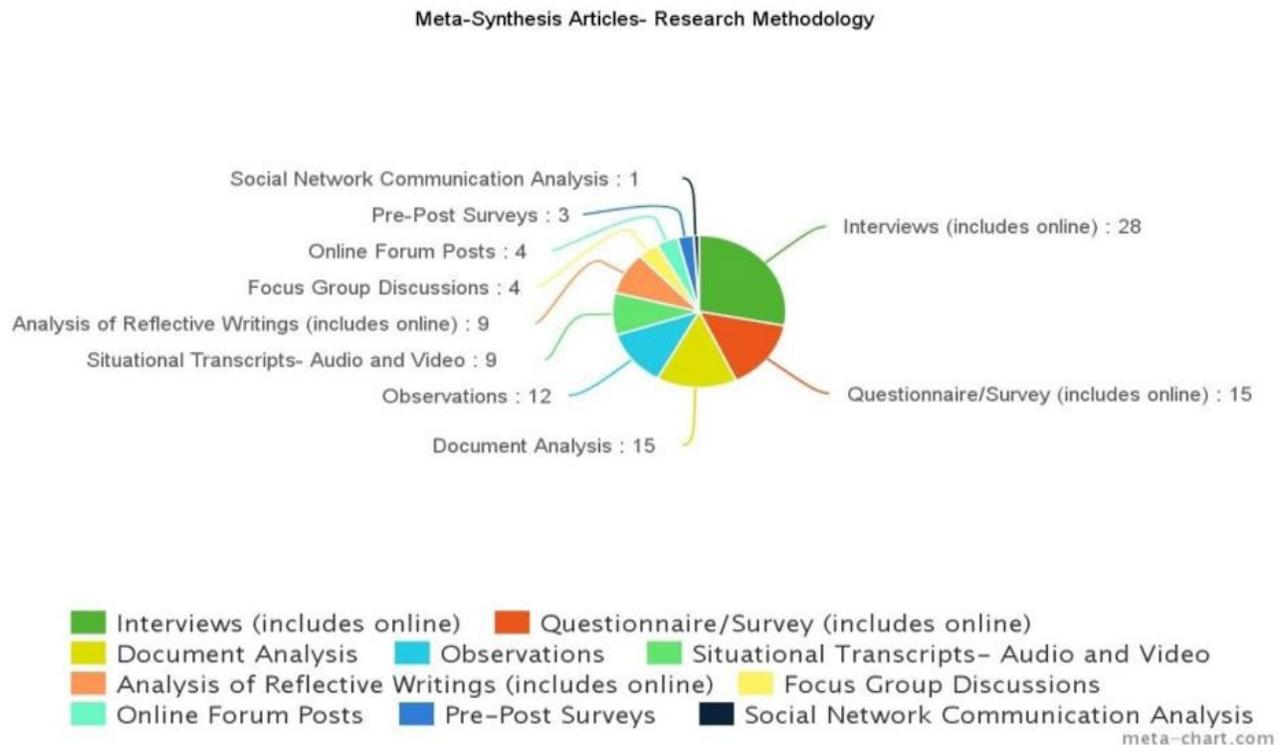


Figure 1. Types of research methods used in the meta-synthesis articles

Findings

After a detailed reading and an analysis of the findings from the 27 articles used for this meta-synthesis, a number of thematic categories emerged and were related to Hargreaves's and Fullan's (2012) framework of "professional capital." The emergent themes from the research were grouped, with three themes connecting to each of the three components of professional capital, for a total of nine themes. The nine emergent themes are: teacher attitudes and beliefs, teacher emotions, student engagement, role of collaboration, school structure, relational trust, professional learning, perception of support, and school leadership. These nine themes were tracked throughout the findings of the meta-synthesis as a way to evaluate the most pervasive and significant themes (Figure 2).

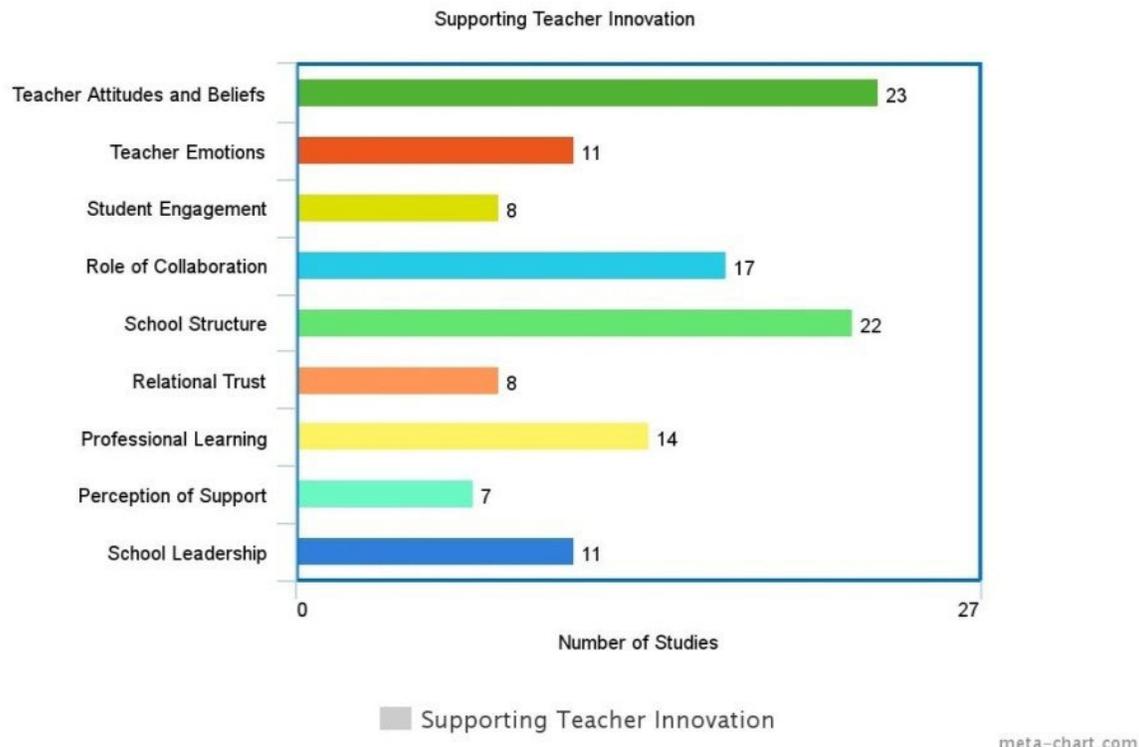


Figure 2. Tracking the frequency of the nine themes in the meta-synthesis articles

Teacher Beliefs and Attitudes (Human Capital)

Twenty-three of the 27 articles addressed the impact of teacher beliefs and attitudes. An understanding of the teacher's role as an independent change agent was significant in creating new pedagogical structures (Ali, 2011; Davies, 2013; Emo, 2015; van Veen, Slegers, & van de Ven, 2005) by supporting self-determination and autonomy in innovative practices and promoting belief in their own innovations (Little, 2002). Russell and Schneiderheinze (2005) point to the importance of allowing teachers to negotiate the process of innovation, whether the impetus for change comes from a source internal or external to the teaching situation (see also Raksit, 2006; Vennebo & Ottesen, 2015) in recognition of the influence that school structure has on efforts to innovate (Fallon & Barnett, 2009) and views teachers hold of themselves as innovators and curriculum designers (Emo, 2015).

Beliefs and attitudes can also affect how teachers view the process of innovation (Edwards et al., 2014), the administrative support they have to pursue change (Phelps & Graham, 2008; Raksit, 2006), and their ability to deal with innovation friction, as old and new ideas may conflict (Bakkenes, Vermunt, & Wubbels, 2010). The success or failure of many innovations was found to depend on how well the proposed change matched, or demonstrated congruence, with a teacher's own belief system. Individual teacher beliefs about educational practices were found by many studies to have a major impact on the adoption and implementation of new practices (Bakkenes et al., 2010; Casey, 2012; Emo, 2015; Owen, 2015; Russell & Schneiderheinze, 2005; Tondeur, Devos, Van Houtte, van Braak, & Valcke, 2009; Vennebo & Ottesen, 2015; Wallace & Priestly, 2011). These studies demonstrate that understanding the success or failure of an innovation may be related to how new concepts connect to a teacher's existing belief system.

The studies also show that educators may not undertake an innovation if they have doubts about their own abilities (Abrami et al., 2004; Davies, 2013; Goodyear & Casey, 2015; Phelps & Graham, 2008). Successful innovators believe in their own efficacy and this confidence allows for increased risk tolerance when undertaking new practices (Davies, 2013). Emo (2015) argues that in order to embrace innovation, teachers have to create situations that produce uncertainty in their jobs, requiring that they have confidence to believe in the likelihood of their own success and the ability to analyze and maintain a professional orientation toward positive change (Davies, 2013). These studies make it clear that teachers need to feel confident when trying something new. Without this belief in their own efficacy, teachers are unlikely to embrace innovation in their teaching practice.

Teacher Emotion (Human Capital)

These studies yielded several key findings uniquely connected to emotions. Firstly, Bakkenes and colleagues (2010) found that teachers reported struggle and friction as they attempted change, experiences that gave rise to powerful emotions (see also van Veen et al., 2005). Stam and colleagues (2014) found that innovation itself can have a strong emotional impact on teachers. Secondly, emotions affect the change process in a positive way, as they can be motivating factors in undertaking change (Abrami et al., 2004). Wallace and Priestly (2011) found that teachers are more likely to experience positive

emotions when they feel empowered as professionals to adapt and implement innovation as they see fit (see also Emo, 2015). Thirdly, an especially interesting finding of two of the studies was the motivating factor of boredom. Owen (2015) found that many teachers were motivated to make changes due to boredom with the curriculum (see also Emo, 2015).

The final connection between emotion and innovation discussed in this theme is the influence of confronting vulnerability. Teachers can feel extremely vulnerable when trying new methods (Abrami et al., 2004; Bakkenes et al., 2010; Emo, 2015; Fallon & Barnett, 2009; Phelps & Graham, 2008; Russell & Schneiderheinze, 2005), which can result in avoidance when faced with the contradictions and tensions inherent in new practices, causing them to respond by narrowing their goals as a way to reduce the vulnerability they feel when implementing an innovation in their classrooms (see also Edwards et al., 2014; Fallon & Barnett, 2009). These studies show the importance of acknowledging the complex emotions associated with innovation.

Student Engagement (Human Capital)

As discussed earlier, human capital is related to the capabilities of the individual teacher (Hargreaves & Fullan, 2012). One of the most important characteristics of a teacher is the ability to engage students, drawing them into the learning process (Hatt, 2005). Many of the studies in the meta-synthesis point to the importance of student engagement in motivating an innovation, gauging its success, and supporting its continued implementation. Teachers who found an increase in student engagement as a result of a new initiative were more likely to be motivated to sustain the innovation (Ali, 2011; Davies, 2013; Edwards et al., 2014; Emo, 2015; Goodyear & Casey, 2015; Owen, 2015; Zehetmeier, 2015). The link between student engagement and improved student learning is well established (Emo, 2015; Owen, 2015; Pil & Leana, 2009) and many of the studies found that improving student learning was a powerful motivator for teachers to innovate their practice and pursue professional learning (Davies, 2013; Goodyear & Casey, 2015; Zehetmeier, 2015). Increased student engagement may also be a key factor in mitigating vulnerability, as positive student response was shown by several studies to decrease the sense of uncertainty felt by teachers when trying something new (Davies, 2013; Goodyear & Casey, 2015).

Improving student engagement is a significant motivator for undertaking innovation, and the positive response of students is a powerful force in sustaining innovative practices.

Collaboration (Social Capital)

According to sociocultural theory, human beings learn through interaction, progressively co-constructing all knowledge within a social setting (Coburn, Mata, & Choi, 2013; John-Steiner & Mahn, 1996; Wallace & Priestly, 2011). In collective endeavours, teachers can alternately play the roles of learner and expert, allowing members of the group flexibility in both roles as the collaborative process evolves (Stam et al., 2014). Casey (2012) observed that while individual reflective practice can lead to positive change, it should be part of a collaborative process if it is to be truly effective, according to the findings of several studies (see for example Emo, 2015; Owen, 2015). In these studies, the collaborative structure provided support and sustained a high level of collegiality—two aspects which are essential to providing a safe environment to take the risk of innovating (Ali, 2011; Fallon & Barnett, 2009) and offering the supports needed to sustain the innovation (Coburn et al., 2013; Frank et al., 2011; Goodyear & Casey, 2015; Owen, 2015; Skerrett, 2010).

Coburn and colleagues (2013) found that even teachers who exhibit the highest level of expertise in implementing a particular innovation were vulnerable to returning to old methods when faced with a lack of social interaction and support. These studies affirm the importance of collaboration, not only for initiating innovative practices, but for supporting their continued use. Social and political policy can have a significant effect on teacher collaborative networks (Coburn et al., 2013). Policy affects network formation as it influences the construction and support of formal professional structures that are both social and collaborative, allowing teachers to access expertise and moral support as they work through the implementation of an innovative practice. However, Coburn and colleagues (2013) also found that these formal collaborative networks are subject to rapid decline should these resources be withdrawn. Additionally, Lohman and Woolf (2001) contend that informal and unplanned social interactions provide the needed support for innovations to succeed (see also Skerrett, 2010). Interestingly, both formal and informal collaborative practices can act as support for reflection and change, and can be equally damaging when that support is withdrawn.

Many studies acknowledged that the data showed clear limits to the levels of collaboration undertaken by teachers. Fallon and Barnett (2009) studied one school's efforts to transform its organizational structure, revealing significant inner conflicts in teacher collaborative structures (see also Russell & Schnerderheinze, 2005). To combat this, these researchers argue, teachers themselves (who ironically often teach these same skills to their students), may need coaching in cooperative skills as they move to more interactive professional environments (Stam et al., 2014).

School Structure (Social Capital)

Twenty-two of the 27 articles indicated that school structure, including the physical layout, had a significant impact on the process of supporting and sustaining teacher innovation (Aubusson et al., 2007; Casey, 2012; Coburn et al., 2013; Little, 2002; Lohman & Woolf, 2001; Tondeur et al., 2009; Vennebo & Ottesen, 2015). The absence of informal professional spaces inhibited the opportunities for teachers to discuss innovative practices and share successes and challenges.

Teacher isolation was also attributed to the impact of the primary working conditions of teachers (Fallon & Barnett, 2009; Little, 2002; Skerrett, 2010). Little (2002) described the nature of teaching as “widely familiar and deeply private” (p. 934). Lohman and Woolf (2001) found that when assessing the success of their own initiatives, teachers primarily use solitary self-reflection to determine their success—a direct result of their professional isolation from one another. Indeed, the norms of privacy and isolation in teaching can directly affect how a teacher develops identity and beliefs about personal teaching practice. Fallon and Barnett (2009) attempted to explain this by recognizing that schools are complex social structures, where high levels of collegial interaction in teaching practice may prove difficult to attain, and efforts to introduce critical discourse or observation of teaching practice can cause a strain on professional relationships (Little, 2002). Therefore, innovations that teachers undertake can be poorly disseminated (Casey, 2012; Fallon & Barnett, 2009; Little, 2002; Lohman & Woolf, 2001; Raksit, 2006). Similarly, difficulties can be found from the highly prescribed schedule of the school day (Coburn et al., 2013; Edwards et al., 2014; Emo, 2015; Little, 2002; Lohman & Woolf, 2001; Phelps & Graham, 2008; Raksit, 2006; Sandoval-Lucero, Maes, & Pappas, 2013; Tondeur et al., 2009; van Veen et al., 2005; Wallace & Priestly, 2011; Zehetmeier, 2015).

Having the time to explore new methodology can affect how deeply an initiative is integrated into teaching practice and thereby sustained (Edwards et al., 2014).

Lohman and Woolf (2001) reported that teachers “cope with the intensification of their jobs by spending less time interacting with their peers and thinking independently” (p. 69). Raksit (2006) found that lack of time is often a significant factor in a teacher’s decision to initiate or participate in an innovation (see also Wallace & Priestly, 2011). Teachers who face significant demands in their personal lives may find it nearly impossible to take on the extra workload of new initiatives, thus opening the door to criticism or a perception that they are resistant or unwilling to embrace innovative practices. As well, teachers may not prioritize a specific initiative if it is mandated, or they may devote less time to self-initiated innovations if external demands also vie for limited time (van Veen et al., 2005).

The concept of school structure as an influencing factor in teacher innovation was considered by many of the researchers to be a primary factor in the success or failure of teacher innovation (Ali, 2011; Casey, 2013). Vennebo and Ottesen (2015) found that structural aspects of schools affect both the physical layout and the embedded frameworks for thinking about teaching and learning.

Relational Trust (Social Capital)

In the meta-synthesis studies, researchers indicated that the existence of relational trust (Aubusson et al., 2007; Fallon & Barnett, 2009; Tschannen-Moran, 2014) was a required condition to support the risk-taking that comes with innovation, and that teachers will take increased risks with innovative practices as the school climate becomes more and more trusting. Coburn and colleagues (2013) found that increased trust mitigated the risk of talking to colleagues about the successes and challenges of new reform efforts. Similarly, Fallon and Barnett (2009) found that trust building was a requirement for the process of innovation and restructuring undertaken by a particular school.

Sandoval-Lucero, Maes, and Pappas (2013) found that allowing teachers the autonomy to develop their own relevant projects was essential to success. Davies (2013) reported that teachers who implemented innovations in their classrooms were supported by their school leadership, who increasingly saw them “as professionals who were capable of making good educational decisions about their pupils’ learning and also being trusted

to make them” (p. 67). Zehetmeier (2015) discovered that even if teachers are innovating their practice in an isolated classroom, the impact of relational trust can be significant, and a key to creating a culture of appreciation among professionals. The existence of relational trust among all members of a school community can provide the support and professional autonomy necessary for teachers to face the vulnerability that often comes with innovation.

Professional Learning (Decisional Capital)

Professional learning was connected to innovation in many of the studies, and teacher learning was seen to be significant to ensure implementation and sustainability of innovation. Bakkenes and colleagues (2010) found that educational innovations have often failed because proponents did not recognize the need for teacher learning. In addition, the perception of what constitutes teacher learning can be contentious. A common finding was that teachers who undertake innovations also consider themselves to be learners (Ali, 2011; Bakkenes et al., 2010; Davies, 2013; Emo, 2015; Frank et al., 2011; Owen, 2015; van Veen et al., 2005) and professionals who are capable of applying their learning to achieving improved learning for students.

Several researchers stress the importance of teacher choice in professional learning opportunities. Lohman and Woolf (2001) found that the success of collaborative learning opportunities was in large part determined by whether teachers’ decisions to participate had been by personal choice (see also Bakkenes et al., 2010; Emo, 2015). Frank and colleagues (2011) found that at the beginning stage of new learning, professional development provided by outside experts offers the most effective way to support new learning (see also Bakkenes et al., 2010; Goodyear & Casey, 2015; Kwakman, 2003). Alternatively, other studies asserted that on-site, contextual learning experiences for teachers will be much more effective in supporting teacher innovation (Frank et al., 2011; Vennebo & Ottesen, 2015), giving an unclear pattern for this aspect of teacher innovation. Although there was some debate about location and delivery of professional learning programs, all of the studies that discussed teacher learning agreed that the ability to transform new knowledge into an approach specifically designed for each unique context is extremely important (Edwards et al., 2014; Russell & Schneiderhenze, 2005; Vennebo & Ottesen, 2015).

Perception of Support (Decisional Capital)

Teachers' efforts to innovate may be influenced by the perception of support from their colleagues, their administration, and their school. Teachers who believe that they are fighting to initiate innovations because of a lack of success or support can progressively be demoralized and disillusioned, often scaling back their own innovative practices (Ali, 2011; Casey, 2012; Fallon & Barnett, 2009; Frank et al., 2011; Phelps & Graham, 2008; Raksit, 2006; van Veen et al., 2005; Zehetmeier, 2015). Several of the studies detail ways in which entire schools transformed themselves into communities that supported individual teacher innovation. Goodyear and Casey (2015) determined that schools that celebrate innovation are expressing support for risk-taking and innovation (see also Edwards et al., 2014). The allocation of resources, including time, was a frequently mentioned contributor to the perception of support for innovation (Aubusson et al., 2007; Coburn et al., 2013; Frank et al., 2011; Lohman & Woolf, 2001). Only one of the studies supported the use of resources as rewards for innovation. Lohman and Woolf (2001) argue that reward systems, such as offers of increased resources, should be considered as "meaningful incentives for participation in such activities to promote the diffusion of teacher expertise throughout the school system" (p. 73). In contrast, Raksit (2006) found that many teachers were discouraged from trying new innovations because of an unfair allocation of resources. Resource allocation and the perception of support from school administration were found to influence the formation of networks that supported teacher innovation (Coburn et al., 2013).

School Leadership (Decisional Capital)

School administrative leadership can have a significant impact on how innovation is supported. According to the studies, the approach of administrative leadership can impact innovation in many ways. Sandoval-Lucero and colleagues (2013) found that institutional cultures that support change can be heavily influenced by school leadership (see also Stam et al., 2014). However, Aubusson and colleagues (2007) found that teachers who were forced by their school leadership to participate in innovative practices remained resentful of the work they were asked to undertake. Results from some of the studies showed that teachers might be discouraged from attempting reform if their efforts are not supported by administration (Lohman & Woolf, 2001; Raksit, 2006; Zehetmeier,

2015). Many studies found that as schools scaled up their commitment to innovation, they recognized the need to support the development of leadership among staff (see for example Aubusson et al., 2007), mutual mentorship and in-school apprenticeships (Skerratt, 2010), and building leadership capacity in the school (Emo, 2015; Fallon & Barnett, 2009; Lohman & Woolf, 2001; Wallace & Priestly, 2011).

Summary of Themes

These nine themes offer a way to frame the multifaceted research about teacher innovation presented in the articles studied for this meta-synthesis. Figure 3 expresses the relationship among the nine emergent themes that were evident from the meta-synthesis.

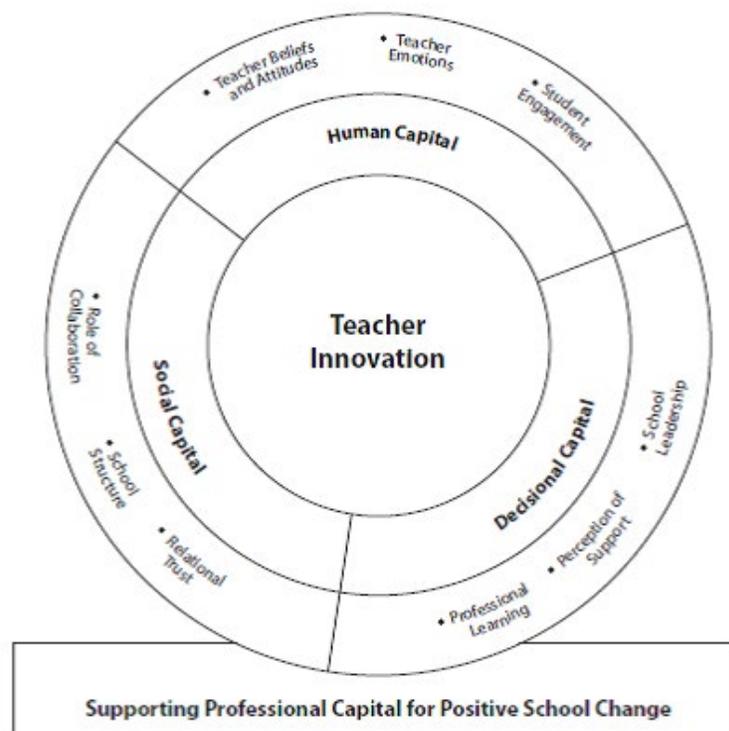


Figure 3. Teachers' professional innovation and creativity model

In the centre of the diagram lies the heart of positive school change—teacher innovation. Surrounding this is a ring that contains the three components of professional capital, each of which supports teachers as they strive to make changes in their practices

that positively affect students. The outside circle contains the nine themes divided by their connection to the three aspects of professional capital. This diagram represents the flow of influence among these layers in both inward and outward directions. The entire circle sits on a pedestal, demonstrating that all aspects of teacher innovation are influenced by the fostering of professional capital that in turn supports positive school change. In this way, teacher innovation will influence the building of professional capital at a school, just as the investment in professional capital will support and encourage sustainable teacher innovation.

Analysis

The purpose of a meta-synthesis is to examine the interpretive findings of multiple articles with the purpose of gaining new insights or developing a new perspective or a more complete understanding of a phenomenon (Aspfors & Fransson, 2015). Each of the research questions is addressed through this analysis.

Question #1: Why are teachers motivated to undertake and sustain self-initiated innovation?

The research literature did not support the importance of making a distinction between self-initiated innovation and innovation that was initiated as a result of an outside influence. Based on the results of the meta-synthesis, teachers are primarily motivated to innovate in order to improve student learning (Davies, 2013; Emo, 2015; Goodyear & Casey, 2015; Zehetmeier, 2015). Several studies found that teachers innovate to keep the curriculum fresh and interesting for themselves and the students (Emo, 2015; Owen, 2015). The meta-synthesis also revealed that teachers are often pushed into innovation by changes in curriculum, policy, and the introduction of new technology or teaching materials (Bakkenes et al., 2010; Emo, 2015; Kwakman, 2003; Lohman & Woolf, 2001; Stam et al., 2014). Wallace and Priestly (2011) found that teachers who were able to transform reforms according to their own beliefs were more likely to sustain new practices in their classrooms. New methods that are offered as a package to be implemented exactly as presented were less likely to be adopted by teachers (Edwards et al., 2014; Vennebo & Ottesen, 2015). Innovations that are developed or adapted to a specific school context are

much more likely to result in long-term and sustainable positive change (Tondeur et al., 2009; Wallace & Priestly, 2011).

Question #2: What conditions support teachers to innovate their practice?

Several of the emergent themes in the meta-synthesis discussed essential factors in supporting teachers to initiate and sustain innovations in their practice. Professional collaboration was most frequently addressed as a strategy to support teacher innovation, with 17 of the 27 studies citing its importance. Collaboration and relational trust are addressed in many articles as overlapping themes. This gives credence to the argument put forward by several studies that true collaboration, an essential support for teacher innovation, cannot exist without relational trust (Aubusson et al., 2007; Coburn, et al., 2013; Fallon & Barnett, 2009; Goodyear & Casey, 2015; Sandoval-Lucero et al., 2013).

It was clear from the meta-synthesis results that the physical layout of schools and the isolation of teachers in their classrooms are barriers to collective and sustained innovation in schools. The classroom isolation still commonly experienced by teachers contributes to a resistance to innovate, as teachers who never see into other classrooms may believe that students are learning effectively with the “tried and true” methods. Interestingly, while reluctance to embrace change has often been conceived of as a lack of care for students, this study reframes this assumption, suggesting that teachers who seem resistant to change could in fact be making decisions that they feel will ensure greater student achievement. Examining ways to break down these barriers and understand the complex interplay between independence and collective work in teaching could help to support the development of innovative practices.

Another interesting finding was how strongly innovative practices are affected by the attitudes and beliefs of teachers. It was not surprising that so many articles made mention of “innovation-oriented teachers” (Ali, 2011; Casey, 2012; Emo, 2015; Raksit, 2006; van Veen et al., 2005). Because of the tremendous individual responsibility that teachers hold to ensure student achievement, they must develop methods that suit individual teaching styles and personal approaches to classroom structure and, ultimately, must develop a personal process best suited to their own ability. Therefore, what could be seen as reluctance or inflexibility may in fact be an issue of congruence. This new

understanding has offered a way to see how a school community needs to differentiate its response to innovation.

Question #3: How do schools support teacher resiliency when facing the challenges of self-initiated change?

Based on the results of the meta-synthesis, schools need to pay attention to the importance of teacher identity, attitudes, and beliefs. As mentioned in many of the studies, supporting the identity of teachers as change agents is a significant part of encouraging change, particularly when it is fraught with conflict and challenge (Hargreaves, 2004; Stam et al., 2014). A pre-existing sense of relational trust was shown by the meta-synthesis results to be an essential part of taking a risk. Assurance of support from colleagues and all levels of administration can give teachers the freedom to try something new without fear of professional repercussions. Collaboration, not surprisingly, emerged as a key theme in supporting teacher resiliency when facing an innovation (Aubusson et al., 2007; Little, 2002; Owen, 2015; Skerrett, 2010). Even the existence of informal networks was shown to provide support to teachers taking risks and facing challenges (Coburn et al., 2013). The opportunities to collaborate with colleagues to integrate new methods and reflect on challenges and successes were shown to be primary factors in whether innovations became integrated and sustainable.

Conclusion

This meta-synthesis has provided the opportunity to develop new understandings from theoretical and empirical work that can be directly applied to professional work as a classroom teacher. Certainly, there are limitations to this type of study, as qualitative findings, particularly those based on case studies and small samples, cannot always be generalized to other contexts. However, the prevalence of some themes in the studies certainly warrants further examination. It would be very interesting to continue to investigate how schools and teachers work to overcome the isolating organizational structure of the classroom. In addition, it is important that educational administrators at many levels pay attention to the significance of local adaptation. Giving teachers the conceptual understanding

of a new method or innovation and then allowing them to adapt it to their context makes sense as a way to support professional capital and sustain innovative practices.

This meta-synthesis contributes to a greater understanding of how teachers work under specific constraints such as time and isolation, and how innovation involves adapting new understandings to suit their students as well as their own teaching context. The concept of professional capital acknowledges that effective teaching practice is difficult and complex, requiring “technical knowledge, high levels of education, strong practice within schools and continuous improvement over time that is undertaken collaboratively” (Hargreaves & Fullan, 2013). A thorough understanding of how to support teachers in their roles as agents of positive change will inevitably contribute to ongoing and sustainable innovation in schools.

Appendix: Meta-Synthesis Articles

Study	Location	Participants	Methodology	Innovation Studied
Abrami, Poulsen, & Chambers, 2004	Montreal, QC	933 participants Primary, secondary, social affairs and vocational teachers	Cooperative Learning Implementation Questionnaire (CLIQ) Interviews of some participants	Study addressed the use of cooperative learning techniques
Ali, 2011	Pakistan	50 teachers at 6 secondary schools	Case study methodology was used with data collected from interviews, meetings, observations, discussions, oral reflections, and document analysis.	Study involved an investigation of the values and practices of improvement-oriented teachers (IOTs)
Aubusson, Steele, Dinham, & Brady, 2007	Australia	Elementary and secondary school teachers at 82 schools	Data collected through pre- and post-surveys, questionnaires, interviews, and case studies	Study included evaluating if and how school-based action learning projects were involved in building a mature learning community
Bakkenes, Vermunt, & Wubbels, 2010	Netherlands	94 experienced secondary school teachers at 3 schools	Data collected by digital logs written by participants	Study of teacher responses to a national innovation program in secondary school education
Casey, 2012	United Kingdom	1 secondary school PE teacher	Data collected through longitudinal self-study using reflective diary entries and the observations of colleagues, and student interviews.	Study of a planned innovation in PE curriculum using action research and reflective practice
Coburn, Mata, & Choi, 2013	Southwestern United States	12 elementary school mathematics teachers	Data collected through classroom observations, interviews, and social interaction analysis	Studied how teacher networks affect the sustainability of a district-mandated mathematics curriculum reform
Davies, 2013	United Kingdom	3 school teams of primary, secondary and special needs school teachers, 3 external coordinators and an external arts advisor	Data collected by focus group discussions, questionnaires, and an analysis of the final project report compiled by participants	Study of how collaborative networks and external advisors influenced the implementation of a creative action research project

Study	Location	Participants	Methodology	Innovation Studied
Edwards, Kirwin, Gonyeau, Matthews, Lancaster, & DiVall, 2014	United States	25 college-level faculty members	Data collected through web-based survey instruments, online reflections, and at department meetings	Study describes an innovation challenge among faculty in which faculty members commit to initiating and documenting one innovative teaching practice
Emo, 2015	Midwestern United States	30 elementary, secondary and university level teachers	Case study methodology used with data gathered by interviews	Study explores why teachers implement innovations in their teaching
Fallon & Barnett, 2009	British Columbia, Canada	18 elementary school teachers	Case study approach was used with data collected from school documents, and meeting observations	Study details the efforts by a school staff to transform their internal organization into a collaborative environment meant to support innovation through collegial interaction
Frank, Zhao, Penuel, Ellefson, & Porter, 2011	Midwestern United States	25 elementary schools in 10 school districts	Data collected through surveys, interviews, and observations of professional development	Study sought to increase understanding of how knowledge of new and innovative practices is diffused within a school
Goodyear & Casey, 2015	United Kingdom	6 secondary school PE teachers and an external advisor	Data collected through surveys, Facebook and Twitter messages, phone conversations, interviews, and observations	Study sought to understand if implementing principles of Cooperative Learning would be more successful with the development of a Community of Practice supported by an external advisor
Kwakman, 2003	Netherlands	16 participated in the discussions; 10 schools participated in the survey	Data collected by group discussion, observation, and survey	Study explores why teachers participate in certain types of professional development experiences and whether the school environment is conducive to professional learning

Study	Location	Participants	Methodology	Innovation Studied
Little, 2002	United States	5 English teachers in two secondary schools	Employed a multilevel case study design with data collected from observation, interviews, surveys, school documents, and recorded situational interactions	Study sought to analyze the nature and significance of professional learning communities in the development of teacher innovation and school reform
Lohman & Woolf, 2001	United States	22 experienced teachers from primary, junior high, and senior high schools	Data collected through interviews and observations	Study explored and described the self-initiated learning activities of experienced teachers
Owen, 2015	Australia	15 teachers from 3 elementary and 3 secondary schools	Case study design used with data collected through interviews and focus group discussions	Study explored the specific professional learning processes that occurred with schools with PLCs and how these impacted student learning
Phelps & Graham, 2008	Australia	Primary and secondary schools in two research phases: Year 1–7 schools and Year 2–9 schools	Action research; used data collected from pre- and post-surveys, workshop evaluations, documentation, journals by participants, notes from meetings, observations, reflections, and reports from schools	Study sought to understand the benefit of using a meta-cognitive approach to increase the adoption and integration of innovative use of ICT
Raskit, 2006	Ontario, Canada	6 teachers and 1 principal of an Ontario secondary school	Data gathered through observations, recorded interviews, and document analysis	Explored how a technological innovation in a school remained a “contained entity” when confined to an individual teacher rather than shared among an entire staff
Russell & Schneiderhe- inze, 2005	Missouri, United States	4 elementary school teachers in 4 cities	Case study methodology with data collected through interviews, phone conference transcripts, chatroom conferences, messages on discussion boards, reflective questionnaires, and documents related to the innovative unit	Study described the influence of professional collaboration on the development of a technology-focused innovative learning environment

Study	Location	Participants	Methodology	Innovation Studied
Sandoval-Lucero, Maes, & Pappas, 2013	United States	16 teachers in an alternative school program for students with special needs	Data collected through interviews and document analysis	Study sought to explain why, after 1 year, teachers continued or discontinued the use of action research as a way to improve classroom practice
Skerrett, 2010	Ontario, Canada	10 teachers in a secondary school English department	Data collected through interviews, observations, and document analysis.	Study explored the opportunities and constraints faced by teachers when trying to create a collaborative learning community
Stam, Miedma, Onstenk, Wardekker, & ten Dam, 2014	Netherlands	23 secondary school teachers, and 28 educational stakeholders	Case study methodology with data collected through interviews with teacher participants and those they connected with as they innovated their practice	Study explored how and what teachers learn by innovating their own educational practice and the individual and systemic issues encountered during the process
Tondeur, Devos, Van Houtte, van Braak, & Valcke, 2009	Belgium	527 teachers in 68 elementary schools	Data collected through survey results	Study examined the connection between cultural and structural school factors and how they influenced innovative ICT integration
van Veen, Slegers, & van de Ven, 2005	Netherlands	1 secondary school teacher with 25 years of teaching experience	Data collected in several rounds of semi-structured interviews	Study examined the emotional response of one “reform-enthusiast” teacher to educational innovations
Vennebo & Ottesen, 2015	Norway	Technology project team: 2 secondary school teachers and 2 consultants	Ethnographic methodology with data collected through transcripts of recorded team meetings	Study aimed to contribute to an understanding of the work processes through which innovation emerges in situ
Wallace & Priestly, 2011	Scotland	5 secondary school teachers	Case study methodology data collected from interviews, field notes, and classroom observations.	Study investigated the influence that teacher beliefs about teaching, learning, and PD have on the mediation and development of reforms in their own classrooms

Study	Location	Participants	Methodology	Innovation Studied
Zehetmeier, 2015	Austria	2 secondary school teachers	Case study methodology with data collected from interviews, reflective papers, and document analysis	Examined factors that influence the scale-up and sustainability of a PD program's impact

References

References marked with an asterisk indicate studies included in the meta-synthesis and details are provided in the Appendix.

- Abrahamson, E. (2004). *Change without pain: How managers can overcome initiative overload, organizational chaos, and employee burnout*. Boston, MA: Harvard Business Press.
- *Abrami, P. C., Poulsen, C., & Chambers, B. (2004). Teacher motivation to implement an educational innovation: Factors differentiating users and non-users of cooperative learning. *Educational Psychology, 24*(2), 201–216.
- *Ali, T. (2011). Understanding the evolving roles of improvement-oriented high school teachers in Gilgit-Baltistan. *The Qualitative Report, 16*(6), 1616–1644.
- Amabile, T. (2006). How to kill creativity. In J. Henry (Ed.), *Creative management and development* (3rd ed., pp. 223–235). London, England: Sage. doi: 10.4135/9781446213704
- Amabile, T., & Pillemer, J. (2012). Perspectives on the social psychology of creativity. *Journal of Creative Behavior, 46*(1), 3–15.
- Aspfors, J., & Fransson, G. (2015). Research on mentor education for mentors of newly qualified teachers: A qualitative meta-synthesis. *Teaching and Teacher Education, 48*, 75–86.
- *Aubusson, P., Steele, F., Dinham, S., & Brady, L. (2007). Action learning in teacher learning community formation: Informative or transformative? *Teacher Development, 11*(2), 133–148.
- *Bakkenes, I., Vermunt, J. D., & Wubbels, T. (2010). Teacher learning in the context of educational innovation: Learning activities and learning outcomes of experienced teachers. *Learning and Instruction, 20*(6), 533–548.
- Beck, C. T. (2003). Seeing the forest for the trees: A qualitative synthesis project. *The Journal of Nursing Education, 42*(7), 318–323.
- Bergin, C. (2015). *Using student achievement data to evaluate teachers*. Columbia, MO: Network for Educator Effectiveness, College of Education, University of Missouri.

- Retrieved from https://nee.missouri.edu/documents/NEE_White_PaperStudent_Achievement_in_TeacherEvaluation2015_5_20.pdf
- Boyer, E. (1997). Scholarship reconsidered: Priorities of the professorate. In C. E. Glassick, M. Taylor Huber, & G. I. Maeroff (Eds.), *Scholarship assessed: Evaluation of the professoriate* (pp. 13–18). Princeton, NJ: Carnegie Foundation for the Advancement of Teaching.
- Braun, H. I. (2005). *Using student progress to evaluate teachers: A primer on value-added models*. Princeton, NJ: Educational Testing Service. Retrieved from <https://www.ets.org/Media/Research/pdf/PICVAM.pdf>
- Bryk, A. S., & Schneider, B. L. (2003). Trust in schools: A core resource for school reform. *Educational Leadership*, 60(6), 40–45.
- *Casey, A. (2012). A self-study using action research: Changing site expectations and practice stereotypes. *Educational Action Research*, 20(2), 219–232.
- Chenail, R. J. (2009). Bringing method to the madness: Sandelowski and Barroso's Handbook for Synthesizing Qualitative Research. *The Weekly Qualitative Report*, 2(2), 8–12.
- *Coburn, C. E., Mata, W. S., & Choi, L. (2013). The embeddedness of teachers' social networks: Evidence from a study of mathematics reform. *Sociology of Education*, 86(4), 311–342.
- Copland, M. A. (2001). The myth of the superprincipal. *Phi Delta Kappan*, 82(7), 528–533.
- Creswell, J. W. (2012). *Educational research: Planning, conducting and evaluating quantitative and qualitative research*. New York, NY: Pearson.
- Darling-Hammond, L., Wei, R. C., Andree, A., Richardson, N., & Orphanos, S. (2009). *Professional learning in the learning profession*. Washington, DC: National Staff Development Council. Retrieved from <https://learningforward.org/docs/pdf/nsdcstudytechnicalreport2009.pdf?sfvrsn=0>
- *Davies, T. (2013). Incorporating creativity into teachers practice and self-concept of professional identity. *Journal of Educational Change*, 14(1), 51–71.
- Earl, L. M., & Katz, S. (Eds.). (2006). *Leading schools in a data-rich world: Harnessing data for school improvement*. Thousand Oaks, CA: Corwin Press.

- *Edwards, R. A., Kirwin, J., Gonyeau, M., Matthews, S. J., Lancaster, J., & DiVall, M. (2014). A reflective teaching challenge to motivate educational innovation. *American Journal of Pharmaceutical Education*, 78(5), 103.
- Elementary Teachers Federation of Ontario. (2007). *Professional learning communities (PLCs)*. Retrieved from <http://www.etfo.ca/SupportingMembers/Employees/PDF%20Versions/Professional%20Learning%20Communities.pdf>
- *Emo, W. (2015). Teachers' motivations for initiating innovations. *Journal of Educational Change*, 16(2), 171–195.
- *Fallon, G., & Barnett, J. (2009). Impacts of school organizational restructuring into a collaborative setting on the nature of emerging forms of collegiality. *International Journal of Education Policy and Leadership*, 4(9), 1–14.
- *Frank, K. A., Zhao, Y., Penuel, W. R., Ellefson, N., & Porter, S. (2011). Focus, fiddle, and friends: Experiences that transform knowledge for the implementation of innovations. *Sociology of Education*, 84(2), 137–156.
- Freire, P. (1970). *Pedagogy of the oppressed*. New York, NY: Continuum Publishing.
- Fullan, M. (2006). The future of educational change: System thinkers in action. *Journal of Educational Change*, 7(3), 113–122.
- *Goodyear, V. A., & Casey, A. (2015). Innovation with change: Developing a community of practice to help teachers move beyond the “honeymoon” of pedagogical renovation. *Physical Education and Sport Pedagogy*, 20(2), 186–203.
- Greene, M. (1986). In search of a critical pedagogy. In A. Darder, M. P. Baltodano, & R. D. Torres (Eds.), *The critical pedagogy reader* (pp. 84–96). New York, NY: Routledge.
- Hargreaves, A. (2004). Inclusive and exclusive educational change: Emotional responses of teachers and implications for leadership. *School Leadership & Management*, 24(3), 287–309.
- Hargreaves, A., & Fullan, M. (2012). *Professional capital: Transforming teaching in every school*. New York, NY: Teachers College Press.
- Hargreaves, A., & Fullan, M. (2013). The power of professional capital. *JSD, The Learning Forward Journal*, 34(3), 36–39. Retrieved from <http://www.michaelfullan.ca/wp-content/uploads/2013/08/JSD-Power-of-Professional-Capital.pdf>

- Harris, A. (2007). Distributed leadership: Conceptual confusion and empirical reticence, *International Journal of Leadership in Education*, 10(3), 315–325.
- Hatt, B. E. (2005). Pedagogical love in the transactional curriculum. *Journal of Curriculum Studies*, 37(6), 671–688.
- Hattie, J. (2011). *Visible learning for teachers: Maximizing learning for teachers*. New York, NY: Routledge.
- hooks, b. (2003). *Teaching community: A pedagogy of hope*. New York, NY: Routledge.
- John-Steiner, V., & Mahn, H. (1996). Sociocultural approaches to learning and development: A Vygotskian framework. *Educational Psychologist*, 31(3), 191–206.
- King, F. (2014). Evaluating the impact of teacher professional development: An evidence-based framework.” *Professional Development in Education*, 40(1), 89–111.
- *Kwakman, K. (2003). Factors affecting teachers’ participation in professional learning activities. *Teaching and Teacher Education*, 19(2), 149–170.
- Lasky, S. (2005). A sociocultural approach to understanding teacher identity, agency and professional vulnerability in a context of secondary school reform. *Teaching and Teacher Education*, 21, 899–916.
- Leithwood, K., Patten, S., & Jantzi, D. (2010). Testing a conception of how school leadership influences student learning. *Educational Administration Quarterly*, 46(5), 671–706.
- Leithwood, K., & Strauss, T. (2009). Turnaround schools: Leadership lessons. *Education Canada*, 49(2), 26–29.
- *Little, J. W. (2002). Locating learning in teachers’ communities of practice: Opening up problems of analysis in records of everyday work. *Teaching and Teacher Education*, 18(8), 917–946.
- *Lohman, M. C., & Woolf, N. H. (2001). Self-initiated learning activities of experienced public school teachers: Methods, sources, and relevant organizational influences. *Teachers and Teaching: Theory and Practice*, 7(1), 59–74.
- McKenzie, P., Santiago, P., Sliwka, P., & Hiroyuki, H. (2005). *Teachers matter: Attracting, developing and retaining effective teachers*. Paris, France: OECD.

- McNamara, G., & O'Hara, J. (2004). Trusting the teacher: Evaluating educational innovation. *Evaluation, 10*(4), 463–474.
- Mourshed, M., Chijioke, C., & Barber, M. (2010). *How the world's most improved school systems keep getting better*. London, England: McKinsey & Company. Retrieved from <https://www.mckinsey.com/industries/social-sector/our-insights/how-the-worlds-most-improved-school-systems-keep-getting-better>
- Noblit, G. W., & Hare, R. D. (1988). *Meta-ethnography: Synthesizing qualitative studies*. Thousand Oaks, CA: Sage Publishing.
- Noddings, N. (2012). *Philosophy of education*. Boulder, CO: Westview Press.
- Ontario College of Teachers. (2015). Professional Learning Framework—Revised Draft. Retrieved from <https://www.oct.ca/public/professional-standards/professional-learning-framework>
- Ontario Ministry of Education. (2014). *Achieving excellence: A renewed vision for education in Ontario*. Retrieved from <http://www.edu.gov.on.ca/eng/about/renewedVision.pdf>
- *Owen, S. M. (2015). Teacher professional learning communities in innovative contexts: “Ah hah moments,” “passion” and “making a difference” for student learning. *Professional Development in Education, 41*(1), 57–74.
- *Phelps, R., & Graham, A. (2008). Developing technology together, together: A whole-school metacognitive approach to ICT teacher professional development. *Journal of Computing in Teacher Education, 24*(4), 125–134.
- Pil, F. K., & Leana, C. (2009). Applying organizational research to public school reform: The effects of teacher human and social capital on student performance. *Academy of Management Journal, 52*(6), 1101–1124.
- *Raksit, M. (2006). Contained entity of an educational innovation: The realities of micropolitics. *Alberta Journal of Educational Research, 52*(4), 225–240.
- *Russell, D. L., & Schneiderheinze, A. (2005). Understanding innovation in education using activity theory. *Journal of Educational Technology & Society, 8*(1), 38–53.

- Sandelowski, M., Docherty, S., & Emden, C. (1997). Focus on qualitative methods, qualitative metasynthesis: Issues and techniques. *Research in Nursing and Health*, 20, 365–371.
- Sandelowski, M., Voils, C. I., & Barroso, J. (2007). Comparability work and the management of difference in research synthesis studies. *Social Science and Medicine*, 64(1), 236–247.
- *Sandoval-Lucero, E., Maes, J. B., & Pappas, G. (2013). Action research in a non-profit agency school setting: Analyzing the adoption of an innovation after initial training and coaching. *Journal of Education and Learning*, 2(1), 262–277.
- Sawyer, R. K. (2007). *Group genius*. New York, NY: Basic Books.
- Sawyer, R. K., John-Steiner, V., Moran, S., Sternberg, R. J., Feldman, D. H., Gardner, H., & Csikszentmihalyi, M. (2003). *Creativity and development*. Oxford, England: Oxford University Press.
- Scruggs, T. E., Mastropieri, M. A., & McDuffie, K. A. (2007). Co-teaching in inclusive classrooms: A meta-synthesis of qualitative research. *Exceptional Children*, 73(4), 392–416.
- Sherrington, T. (2014). What's the incentive? Systems and culture in a school context. In J. Hallgarten, L. Bamfield, & K. McCarthy (Eds.), *Licensed to create: Ten essays on improving teacher quality* (pp. 55–59). London, England: RSA Action and Research Centre. Retrieved from <https://www.thersa.org/discover/publications-and-articles/reports/licensed-to-create>
- *Skerrett, A. (2010). “There’s going to be community. There’s going to be knowledge”: Designs for learning in a standardised age. *Teaching and Teacher Education*, 26(3), 648–655.
- *Stam, M., Miedema, W., Onstenk, J., Wardekker, W., & ten Dam, G. (2014). Researching how and what teachers learn from innovating their own educational practices: The ins and outs of a high-quality design. *International Journal of Qualitative Studies in Education*, 27(2), 251–267.
- Starko, A. J. (2013). *Creativity in the classroom: Schools of curious delight* (5th ed.). New York, NY: Routledge.

- Thorne, S., Paterson, B., Acorn, S., Canam, C., Joachim, G., & Jillings, C. (2002). Chronic illness experience: Insights from a meta-study. *Qualitative Health Research, 12*(4), 437–452.
- *Tondeur, J., Devos, G., Van Houtte, M., van Braak, J., & Valcke, M. (2009). Understanding structural and cultural school characteristics in relation to educational change: The case of ICT integration. *Educational Studies, 35*(2), 223–235.
- Tschannen-Moran, M. (2009). Fostering teacher professionalism in schools: The role of leadership orientation and trust. *Educational Administration Quarterly, 45*(2), 217–247.
- Tschannen-Moran, M. (2014). *Trust matters: Leadership for successful schools*. San Francisco, CA: Jossey-Bass.
- *van Veen, K., Slegers, P., & van de Ven, P. H. (2005). One teacher's identity, emotions, and commitment to change: A case study into the cognitive-affective processes of a secondary school teacher in the context of reforms. *Teaching and Teacher Education, 21*(8), 917–934.
- *Vennebo, K. F., & Ottesen, E. (2015). The emergence of innovative work in school development. *Journal of Educational Change, 16*(2), 197–216.
- Vermunt, J. D., & Endedijk, M. D. (2011). Patterns in teacher learning in different phases of the professional career. *Learning and Individual Differences, 21*, 294–302. doi: 10.1016/j.lindif.2010.11.019
- *Wallace, C. S., & Priestley, M. (2011). Teacher beliefs and the mediation of curriculum innovation in Scotland: A socio-cultural perspective on professional development and change. *Journal of Curriculum Studies, 43*(3), 357–381.
- *Zehetmeier, S. (2015). Sustaining and scaling up the impact of professional development programmes. *ZDM Mathematics Education, 47*(1), 117–128.