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Collective teacher efficacy research: Productive patterns of behaviour and other positive consequences

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Abstract Collective teacher efficacy (CTE) beliefs serve to encourage certain behaviours and constrain others. Bandura (Educ Psychol 28(2):117–148, 1993) was the first to generate interest in this area by demonstrating that the effect of perceived CTE on student achievement was stronger than the link between socio-economic status and student achievement. The purpose of this study was to gain a better understanding of the productive patterns of behaviour and other consequences resulting from educators' shared sense of efficacy. Studies showed that CTE was associated with a number of productive behaviours including implementation of school improvement strategies, increased teacher leadership, communication of high expectations, and a strong focus on academic pursuits. In addition, CTE was associated with other positive factors including greater job satisfaction, commitment to students and the teaching profession, and positive attitudes toward teaching students with special education needs and professional development. Collective efficacy was negatively related to performance goal orientations and positively related to students' emotional engagement. Finally, there were a number of studies that established the relationship between CTE and individual teacher efficacy. It is important to acknowledge that the relationship between CTE and other variables included in the studies contained within this review are most likely bidirectional. Policy makers, system and school leaders, and staff developers' efforts toward successful education reforms might be better served by strategically and intentionally considering how to foster collective efficacy throughout the conceptualization, design, delivery, and assessment of change initiatives. Suggestions for

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future research and limitations including potential measurement problems of included studies are shared.

Keywords Collective teacher efficacy · Student achievement · Teacher efficacy · Implementation · Teacher leadership · Student misbehaviour · Job satisfaction · Goal orientations · Teacher commitment · Graduation rates · Special education · Professional learning

Introduction

Collective teacher efficacy refers to educators' shared beliefs that through their combined efforts they can positively influence student outcomes, including those who are disengaged, unmotivated, and/or disadvantaged. It is the "collective self-perception that teachers in a given school make an educational difference to their students over and above the educational impact of their homes and communities" (Tschannen-Moran and Barr 2004, p. 190). Adams and Forsyth (2006) noted that "at the organizational level, perceived collective efficacy reflects a teaching faculty's belief in its collective ability to carry out teaching tasks that promote student achievement" (p. 626).

The research on *collective* teacher efficacy (CTE) is relatively new compared to research related to teachers' *individual* sense of efficacy. Past research demonstrates that teacher efficacy influences student achievement indirectly through productive patterns of behaviour. A number of impactful teaching practices, associated with teacher efficacy and known to promote student achievement, have been summarized by Goddard and Goddard (2001) and Tschannen-Moran and Barr (2004). A few include persistence in helping struggling students (Gibson and Dembo 1984, cited in Goddard and Goddard 2001), organized and planful teaching (Allinder 1994, cited in Goddard and Goddard 2001), spending a high proportion of time on task (Wang et al. 1993, cited in Tschannen-Moran and Barr 2004), and an openness to testing new instructional approaches in order to meet the learning needs of their students (DeMesquita and Drake 1994, cited in Tschannen-Moran and Barr 2004).

In 2000, Goddard, Hoy, and Wolkfolk Hoy published a seminal article that extended self-efficacy theory to the collective by elaborating and operationalizing a model of CTE for use in schools. Since then, research demonstrating the relationship between *collective* teacher efficacy and the patterns of behaviour known to promote student achievement (e.g. setting high expectations, fostering parental involvement) has begun to emerge; however, a comprehensive review of the current research does not exist to the author's knowledge. In addition to the productive behaviours exhibited by efficacious teaching staffs, a review of the research identifying other consequences related to CTE does not exist to the author's knowledge.

Even though Ramos et al. (2014) conducted a review of CTE research from 2000 to 2013, the researchers presented the data using different thematic categories than the two suggested in this current study. Klassen et al. (2011) also reviewed teacher

efficacy research from 1998 to 2009 however, their focus was related to the sources, domain specificity, internationalization, and measurement and conceptual problems. Klassen et al. (2011) noted that there was a lack of research attention paid to how efficacy influenced student outcomes, that is, how "collective efficacy promotes positive teaching practices that in turn should result in enhanced student learning" (p. 37). Identifying the knowledge base related to productive patterns of behaviour associated with a sense of collective efficacy would help practitioners in understanding the variables that mediate the strong and positive relationship between CTE and student achievement.

Research was reviewed in search of answering the following two questions:

- What does the research tell us about the productive behaviours that result from collective teacher efficacy?
- What does research tell us about other consequences that result from collective teacher efficacy?

In the next section, research regarding the relationship between CTE and student achievement is shared followed by a brief discussion regarding conceptualization and measurement concerns.

Next, the method for locating relevant research for the current study is outlined along with the findings and discussion. Finally, implications are presented and recommendations for further research are suggested.

The relationship between collective teacher efficacy and student achievement

Research shows that when teachers share the belief that through their collective actions they can positively influence student outcomes, student achievement increases. Bandura (1993) was the first to generate interest in this area by demonstrating that the effect of perceived collective efficacy on student achievement was stronger than the link between socio-economic status and student achievement. Consistent findings have been reported in a number of other studies since. For example, Sandoval et al. (2011) examined the relationship between CTE and student achievement at economically disadvantaged middle school campuses and found that the efficacious campuses could impact student achievement through their belief in their colleagues' ability to impact student achievement regardless of the students' background and socioeconomic status. Goddard et al. (2015) examined the relationships among leadership, teacher collaboration, collective efficacy, and student achievement and found that the more robust the sense of collective efficacy, "the greater their levels of student achievement, even after controlling for school and student background characteristics and prior levels of student achievement" (p. 525). Ramos et al. (2014) indicated that 100% of the studies selected for inclusion in their review of research published between 2000 and 2013 found a positive correlation between CTE and students' performance. The researchers concluded that

when collective efficacy was elevated the negative effects of socio-demographic aspects were reduced.

Eells (2011) conducted the first meta-analysis, synthesizing all available and relevant studies, in order to quantify the correlation between collective efficacy and student achievement. "Collective efficacy was strongly and positively associated with student achievement across subject areas, when using varied instruments, and in multiple locations" (Eells 2011, p. 110). The researcher concluded that "the beliefs that teachers hold about the ability of the school as a whole to promote positive outcomes were predictive of positive learning outcomes for their students" (p. 115). As a result of Eells' (2011) research, Hattie (2016) recently positioned collective teacher efficacy at the top of the list of factors that influence student achievement based on his synthesis of over 1500 meta-analyses.

In both elementary schools and secondary schools there is a compelling body of research that demonstrates a significant positive relationship between CTE and student achievement in mathematics and English. In a large sample study taking place in the United States, Jung et al. (2014) found that the level of teachers' collective efficacy exerted significant influences on kindergarten students' mathematics learning over a school year. Archambault et al. (2012) studied mathematics teachers and secondary students from disadvantaged communities in Quebec. The results from this study indicated that the more efficacious teachers felt in helping their students succeed, the more students' mathematics achievement increased over the course of a year. Similarly, Hoy et al. (2002) found that CTE was more important in explaining school achievement than socio-economic status in a study which also examined mathematics achievement in high schools. Goddard et al. (2000) found that CTE was a more significant predictor of student achievement than socio-economic status in both mathematics and reading in elementary schools. Cybulski et al. (2005) also concluded that the collective efficacy of teachers in elementary schools had a positive direct effect on student reading and mathematics achievement, even when controlling for socio-economic status and prior achievement. Tschannen-Moran and Barr (2004) found that when controlling for socio-economic status, CTE made a significant independent contribution to grade 8 writing scores. Finally, Moolenaar et al. (2012) found that perceived collective efficacy was positively associated with increased language achievement, above the influence of socio-economic status in elementary schools.

The purpose of this article is to review and summarize the extant research regarding the productive behaviours known to promote student achievement that result from a staff's shared sense of collective teacher efficacy. In addition to the productive behaviours, this article also reviews what is known about additional consequences that result from educators' shared belief in their ability to influence student outcomes. Examining CTE and its relationship with other variables will help educators in gaining a better understanding of these concepts and their potential impact on student achievement. However, in order to draw accurate conclusions from this review, it is important to consider conceptual definitions of CTE and measurement tools used in the studies selected for inclusion in this review. If measures are not considered conceptually sound, the results from studies may result in misleading conclusions. A description of the origins of the construct CTE, and

concerns about conceptual and measurement problems highlighted in past research, is outlined below.

Origins, conceptual and measurement concerns

In order to understand the origins of educational studies of CTE, it is useful to consider the concepts of *self-efficacy* and *teacher efficacy*. Forty years ago, the psychological construct, self-efficacy, was conceived by Bandura (1977) as a belief, on part of an individual, that he or she can perform the necessary activities to attain a desired result. Bandura (1977) described a self-efficacy expectation as "the conviction that one can successfully execute the behavior required to produce outcomes" (p. 193). Embedded in this definition is the notion of *convictions* and *beliefs* about competence and not objective measures of actual competence.

The construct of *teacher efficacy* was first conceived by researchers from the RAND organization who defined it as "the extent to which teachers believed that they could control the reinforcement of their actions, that is whether control over reinforcement lay within themselves or in the environment" (Tschannen-Moran et al. 1998, p. 202). In the mid-1970's, in an effort to investigate teacher efficacy, the RAND organization created two questionnaire items designed to reveal the extent to which a teacher believed that the consequences of teaching were internally controlled. Fundamental to the RAND organization's definition was the attribution of student outcomes to either internal or external factors, growing out of the work of Rotter's (1966) concept of locus of control. On the other hand, Bandura's (1977) social cognitive theory, viewed teacher efficacy as a type of self-efficacy and positioned it as an educator's belief about his or her capacity to attain a certain level of competence based on the cognitive processing of different types of past experiences.

This initial lack of clarity in defining the construct of teacher efficacy has caused continued concerns in regard to conceptual and psychometric measurements. Twenty years after the RAND organization operationalized the construct, Tschannen-Moran et al. (1998) examined its conceptual underpinnings and measurement tools in an effort to provide clarify and improve its measure. The researchers suggested that the historical roots of teacher efficacy created confusion about its nature because it grew out of two theoretical perspectives and was based on the existence of "two separate but intertwined conceptual strands" (p. 203).

Even though Bandura attempted to clarify the distinction between self-efficacy and locus of control by providing data demonstrating that perceived self-efficacy was a much stronger predictor of behavior than locus of control and that the two "were not the same phenomenon" (Tschannen-Moran et al. 1998, p. 211), concerns about construct definition and the validity of measures remained. In their analysis of the historical perspectives of teacher efficacy, Goddard et al. (2000) noted that confusion about its nature resulted from the assumption that perceived self-efficacy and locus of control were roughly the same. In addressing the continued need for clarity, the researchers stated that "beliefs about one's capability to produce certain actions (perceived self-efficacy) are not the same as beliefs about whether actions

affect outcomes (locus of control)" (p. 481). They also pointed out that while one may hold a belief that an outcome is caused by the actions of an individual (internally controlled), individuals may still lack the confidence that they are able to accomplish desired actions.

In 2011, Klassen et al. compared research published in the 12 years prior to and 12 years since the time of 1998 publication of the influential summary by Tschannen-Moran et al. and concluded that despite the "clear warnings that have been given about measurement problems by key self-efficacy researchers in prominent journals" (p. 39), there still exists a "lack of conceptual clarity in measuring the construct" (p. 41). The researchers noted that apprehension in regard to the validity of some instruments was due to the items they contained that were orientated toward external determinants, extending from the RAND measure (e.g. The amount a student can learn is primarily related to family background), rather than on "teachers' capabilities to influence outcomes" (p. 22).

What does this mean in relation to the origins of CTE research? When initial interest in measuring CTE began, researchers aggregated scores from self-efficacy questionnaires and therefore the concerns over construct validity remained. However, Bandura (1997) noted that "perceived collective efficacy is an emergent group-level attribute rather than simply the sum of members' perceived personal efficacies" (p. 478). Goddard (2001) also noted that "aggregation alone is not enough to constitute an organizational characteristic" (p. 468). Therefore, questionnaires were redesigned to reflect the object of the efficacy perception— for example, items measuring collective teacher efficacy were re-worded to reflect perceptions based on "we" instead of "I". Regardless of this revision, based on their analysis of scales examined in their research review, Klassen et al. (2011) noted a continued lack of conceptual clarity in widely used measures. The researchers noted that conceptual definitions of collective efficacy were consistent with Bandura's definition but in considering instruments designed to measure collective teacher efficacy, "the actual measures of collective efficacy show less fidelity with theory" (p. 35). The concern regarding items focused on environmental characteristics, noted in teacher efficacy questionnaires, was also true of collective efficacy measures. In addition, distinction between items focused on teachers' current ability rather than the "more theoretically congruent forward-looking capabilities" (Klassen et al. 2011, p. 35) was not present in some of the widely used measures. If measures are not considered conceptually sound, then results from studies may lead to inaccurate conclusions. Implications regarding the conceptualization and measurement of CTE for the studies involved in this review are considered in the limitations section of this paper.

Method

Relevant studies were selected for inclusion in this review according to the following procedures. Educational Resources Information Center (ERIC) and EBSCO databases were searched for peer-reviewed articles written in English and published since 2000. The search terms included "collective efficacy" and

"collective teacher efficacy" and were extended beyond titles to include keywords contained within the articles. This would help to broaden the search and increase the number of hits. The resulting hits (149) were examined in order to determine if the article reported on collective teacher efficacy. Initial screening was conducted by examining article titles and abstracts and skimming the content. Articles that focused solely on teacher efficacy and/or student efficacy were excluded. Articles that reported on the validation of collective efficacy scales (that did not also include results from an empirical study) were also excluded. In addition, the hits that contained key words but focused on something other than collective teacher efficacy (e.g. collective action, collective responsibility) were also excluded. Of the remaining articles (91) those that could be retrieved electronically (79) were saved.

The next level of screening involved detailed scans and sorting of reports. Further exclusions included studies that examined: (a) the impact of leadership on collective efficacy; (b) the contextual factors (antecedents) and/or the four sources that influence collective efficacy; (c) and/or other variables related to collective efficacy (e.g. effects of inspection on collective efficacy). While these categories were of interest to the researcher, they were not relevant for the purpose of the current review, which aimed to examine *behaviours* and *consequences* of collective teacher efficacy. The remaining studies were read in their entirety and a final selection (N = 34) was based on eligibility criteria which included studies of CTE that: (a) reported results in relation to teaching behaviours related to collective teacher efficacy; (b) reported findings in relation to other consequences that educators and/or students experienced related to collective teacher efficacy; and (c) included participants who were practicing teachers in primary, elementary, middle, and/or high school settings.

Findings

Studies showed that CTE was associated with a number of productive behaviours. These behaviours included deeper implementation of school improvement strategies and teachers assuming leadership roles. In addition, where CTE was present, teachers set high expectations and had a strong focus on academic pursuits, which in turn influenced the way they approached their work. Teachers also exhibited greater risk taking, a receptiveness to new ideas, and extended of a sense of efficacy to parents. Studies also showed that in schools where efficacy was present, less students were excluded due to problem behaviour. A sense of CTE was associated with commitment to students and the teaching profession. Beginning teachers were also less likely to leave teaching when employed in schools where educators shared the perception that together they could overcome challenges and meet students' needs. In addition to the positive behaviours, CTE was also associated with other positive factors including greater job satisfaction, less stress and burnout. Collective efficacy was related to positive attitudes toward professional development and positive attitudes toward teaching students with special education needs. Collective efficacy was negatively related to performance goal orientations and positively related to students' emotional engagement. Finally, there were a number of studies

that established the relationship between CTE and individual teacher efficacy. In schools where collective efficacy was present, teachers tended to be more efficacious as well. Additional details of each of these studies are presented in the section that follows. Characteristics of the components studies are outlined in Table 1.

Productive behaviours resulting from collective efficacy

Four studies provided evidence that CTE resulted in deeper implementation of school improvement strategies. Cantrell and Callaway (2008) examined the collective efficacy beliefs of junior high school teachers whose implementation patterns differed based on a year-long professional development program which aimed to integrate literacy strategies into content area classrooms. The researchers found that teachers who exhibited higher levels of collective efficacy required less time to internalize literacy strategies and determine how they could be used to teach content, were more successful in working through the barriers they encountered (including time constraints), and showed greater persistence in "finding resources for multiple strategies and approaches to meeting the needs of students" (p. 1746). Parks et al. (2007) also found a relationship between CTE and implementation in a study that examined 314 elementary teachers' willingness to integrate movement into their classrooms. While noting the benefits from integrating physical movement into classroom activities, the researchers set out to assess variables related to teachers' individual and CTE to promote students' physical activity. Teachers' willingness to integrate was related to CTE and collective efficacy was predicted by the importance the institutional environment placed on integrating movement in classrooms. Tschannen-Moran (2001) also found that implementation of a conflict management program, infused via curriculum integration, was positively related to CTE in a study involving 50 high schools in the United States. Finally, utilizing an Appreciative Inquiry methodology, Lyons et al. (2016) examined the implementation of inclusive education for students with disabilities in Canada. In gathering and documenting successful practices in four inclusive elementary schools, the researchers noted that teachers expressed confidence in their collective efficacy and the shared belief that together they could work through challenges.

Findings from a study by Derrington and Angelle (2013) indicated "a clear and strong relationship between collective efficacy and the extent of teacher leadership in a school" (p. 6). Participants included 719 teachers from 50 schools in the United States. The researchers noted that informal teacher leaders assisted others and actively shared ideas "on a wide-range of topics such as learning, teaching, and managing the classroom" (p. 6). The researchers concluded that teachers who believed in the capacity of the faculty as a whole and in the capability of individual teachers created schools where the extent of teacher leadership was greater and that the relationship between the constructs of teacher leadership and CTE promoted success for students, teachers, and schools.

In a study that compared the distinguishing features of rural schools that had significantly higher graduation rates to those that had average graduation rates,

Table 1 Characteristics of component studies

Study	Design	Sample size	Level	CTE measure	Theme
Ahuja (2007)	Qualitative case study	5 teachers 1 principal	High school	Themes derived from interviews	Commitment (school success)
Avanzia et al. (2015)	Quantitative correlational	192 teachers	High school	Skaalvik and Skaalvik (2007) 7-item scale	Teacher burn-out
Boberg and Bourgeois (2016)	Quantitative mediation analysis	569 teachers	Not reported	Goddard (2002) Collective Teacher Efficacy (CTE) Scale–short form	Engagement (students' emotional)
Calik et al. (2012)	Quantitative structural equation modeling	328 teachers	Primary school	Goddard et al. (2000) Collective Teacher Efficacy CTE Scale–full version	Teacher efficacy
Cantrell and Callaway (2008)	Qualitative interview study	16 teachers	Junior high school	Themes derived from interviews	Implementation (content-area literacy)
Caprara et al. (2003a)	Quantitative multilevel structural equation modeling	2688 teachers	Junior high schools	Self-created 9-item questionnaire (alpha .82)	Job satisfaction
Caprara et al. (2003b)	Quantitative correlational	726 teachers 387 staff	Junior high school	Self-created 8-item questionnaire (alpha .86)	Commitment (school success) and job satisfaction
Chong et al. (2010)	Quantitative survey	222 teachers	Middle School Teachers	Tschannen-Moran and Barr (2004) Collective Teacher Belief Scale (CTBS)	Expectations and academic press
Ciani et al. (2008)	Quantitative survey	156 teachers	High school teachers	Goddard (2002) Collective Teacher Efficacy (CTE) Scale–short form	Goal orientations and teacher efficacy
Derrington and Angelle (2013)	Quantitative correlational	719 teachers	Not reported	Oliver (2001) Teacher Efficacy Beliefs Scale–Collective form (TEBS-C)	Teacher leadership
Garberoglio et al. (2012)	Quantitative analysis participant responses	296 teachers	Not reported	Goddard (2002) Collective Teacher Efficacy (CTE) Scale–short form	Teacher efficacy

Table 1 continued

Study	Design	Sample size	Level	CTE measure	Theme
Gibbs and Powell (2011)	Quantitative survey	197 teachers	Primary schools	Goddard (2002) Collective Teacher Efficacy (CTE) Scale–short form	Student behaviour and teacher efficacy
Goddard and Goddard (2001)	Quantitative hierarchical linear modeling	438 teachers	Elementary school	Goddard et al. (2000) Collective Teacher Efficacy CTE Scale–full version	Teacher efficacy
Goddard et al. (2004b)	Quantitative structural equation modeling	Not reported	High school	Goddard (2002) Collective Teacher Efficacy (CTE) Scale–short form	Persistence
Haworth et al. (2015)	Qualitative interviews	6 teachers	Primary school	Themes derived from interviews	Expectations
Hoy et al. (2002)	Quantitative correlational	Not reported	High school	Goddard (2002) Collective Teacher Efficacy (CTE) Scale–short form	Persistence
Kirby and DiPaola (2011)	Quantitative multiple regression and factor analysis	1292 teachers	Elementary schools	Tschannen-Moran and Barr (2004) Collective Teacher Belief Scale (CTBS)	Academic optimism Engagement (parent and community)
Klassen (2010)	Quantitative exploratory factor analysis	951 teachers	Elementary and secondary school	Tschannen-Moran and Barr (2004) Collective Teacher Belief Scale (CTBS)	Job satisfaction and stress
Klassen et al. (2008)	Mixed methods Survey and Interviews	502 teachers (survey) 24 teachers (interviews)	Secondary teachers	Tschannen-Moran and Barr (2004) Collective Teacher Belief Scale (CTBS)	Culture
Klassen et al. (2010)	Quantitative structural equation modeling	500 teachers	Elementary and middle schools	Tschannen-Moran and Barr (2004) Collective Teacher Belief Scale	Job satisfaction
Kurz and Knight (2003)	Quantitative survey correlational design	113 teachers	High school	Goddard et al. (2000) Collective Teacher Efficacy CTE Scale–full version	Teacher efficacy
Lee et all (2011)	Quantitative exploratory factor analysis	480 teachers	Middle school	Tschannen-Moran and Barr (2004) Collective Teacher Belief Scale (CTBS)	Commitment (students)

Table 1 continued

Study	Design	Sample size	Level	CTE measure	Theme
Lim and Eo (2014)	Quantitative structural equation modeling	367 teachers	Middle school	Goddard et al. (2000) Collective Teacher Efficacy CTE Scale–full version	Teacher burn-out
Lyons et al. (2016).	Qualitative Appreciative inquiry	68 teachers	Elementary school	Themes derived from interviews	Implementation (inclusion) and Engagement (parents)
Parks et al. (2007)	Quantitative survey	314 teachers 38 principals	Elementary school	Modified version of Roth and Solmon (2002) 39-item	Implementation (physical activity)
Rauf et al. (2012)	Quantitative survey	515 teachers	High schools	Self-created 8-item scale (alpha .68)	Attitudes (Professional development)
Skaalvik and Skaalvik (2007)	Quantitative correlational	2249 teachers	Elementary and middle school	Skaalvik and Skaalvik (2007) 7-item scale	Teacher efficacy
Tellez and Manthey (2015)	Quantitative survey multiple regression analysis	578 teachers	Elementary schools	Goddard (2002) Collective Teacher Efficacy (CTE) Scale–short form	Teacher Efficacy
Tiplic et al. (2015)	Quantitative survey	227 teachers	Primary elementary and secondary	Skaalvik and Skaalvik (2007) 7-item scale	Retention
Tschannen-Moran (2001)	Mixed Methods Survey Document analysis Interviews	452 teachers (survey) 50 (documents) 52 (interviews)	High schools	Goddard et al. (2000) Collective Teacher Efficacy CTE Scale–full version	Implementation (conflict management)
Urton et al. (2014)	Quantitative survey	276 teachers	Primary	Schwarzer and Jerusalem (1999)	Attitudes (inclusion and remedial education)
Viel-Ruma et al. (2010)	Quantitative survey	70 teachers	Elementary, middle and high school	Goddard et al. (2000) Collective Teacher Efficacy CTE Scale–full version	Teacher efficacy and job satisfaction

Table 1 continued

Study	Design	Sample size	Level	CTE measure	Theme
Ware and Kitsantas (2007)	Quantitative exploratory factor analysis	26 257 teachers 6711 principals	Not reported	Self-created 6-item scale (alpha .78)	Commitment (profession)
Wilcox et al. (2014)	Qualitative multiple case study	63 teachers	High school	Themes derived from interviews	Engagement (parents and community)
					Risk taking, innovation

Wilcox et al. (2014) noted distinct differences in teachers' "expressed individual and collective efficacy in supporting youth to achieve a high school diploma" (p. 9). The researchers listed several important contrasts between the two sets of high schools including: (a) the qualities of academic goals, expectations, and learning opportunities; (b) the nature of individual and collective educator efficacy; (c) the strategies educators used to develop and maintain family relationships and engage community members; and (d) mechanisms for adapting instruction and employing interventions for students at risk of dropping out. Wilcox et al. (2014) noted that the "features of practices and processes, which distinguished the higher from the average performers, appear to be intertwined and mutually supportive" (p. 13). For example, "individual and collective efficacy manifested in a proactive approach to setting goals and aligning programs and practices to meet those goals. This process required reaching out to families and helping them to understand the need for and benefit of programs that would help their children to meet state requirements for graduation and potentially be better prepared for college or career" (p. 13). Wilcox et al. (2014) noted that in schools where teachers shared a sense of collective efficacy teachers spoke of taking risks to innovate and meet students' learning needs. Administrators in these schools also noted that teachers were receptive to new ideas. In the lower-performing schools, teachers "described feeling that they had done all they could do" (p. 9). It was reported that the sense of efficacy and engagement had been extended to educators' relationships with families and community in the higher-performing schools.

Kirby and DiPaola (2011) also found that collective efficacy, one aspect included in the construct 'academic optimism', helped to bridge relationships between schools, parents, and communities. In this study, the researchers found a statistically significant positive relationship between academic optimism and parental and community engagement in urban elementary schools. The researchers noted that since current research supports findings that working class parents are less likely to be involved in schools, the significance between CTE and community engagement in urban schools is noteworthy. Also of relevance, Lyons et al. (2016) noted, in their examination of implementation of inclusive education, that parents were considered "part of the team" and that "concerted efforts were made to involve parents in authentic and meaningful ways" (p. 895).

Chong et al. (2010) studied middle school teachers in Singapore and, similar to Wilcox et al. (2014), found that "when teachers feel efficacious about their self- and collective capability to promote learning and instruction, they are more likely to perceive high expectations, standards and press from the school leadership, and parents and students for academic success" (p. 188). Haworth et al. (2015) also concluded that collective efficacy had a positive influence on teachers' expectations in a study that examined CTE for teaching English language learners in primary schools in New Zealand.

Chong et al. (2010) noted that schools characterized by high levels of CTE were better positioned "to communicate a press for effective teaching and learning that produces positive outcomes" (p. 188). Goddard et al. (2004b) found that "the expectations for attainment set by perceived collective efficacy influence the diligence and tenacity with which teachers approach their work" (p. 420) in a study

of high school teachers in the Midwestern United States. Goddard et al. (2004b) noted that schools characterized by high levels of CTE "communicate a press for effective teaching and learning that yields positive outcomes" (p. 420). In addition, Hoy et al. (2002) studied the efficacy beliefs of teachers in 97 high schools in Ohio and determined that when CTE was high, a strong focus on academic pursuits not only directed the behaviour of teachers and helped them persist but it also reinforced a pattern of shared beliefs held by other teachers and students. Hoy et al. (2002) concluded that "strong collective efficacy leads teachers to be more persistent in their teaching efforts, set high and reasonable goals, and overcome temporary setbacks and failures" (p. 90).

Gibbs and Powell (2011) found that CTE impacted how teachers responded to problem behaviour. The researchers investigated the relationship between teachers' individual and collective beliefs about their efficacy with children's behaviour and whether these beliefs were associated with the use of exclusion as a sanction. The researchers found that "in schools where the group mean collective efficacy for addressing external influences was higher, exclusions were used less" (p. 579). A sense of CTE resulted in a reduction of exclusion as a way of solving problem behaviour in this study. Lyons et al.'s (2016) examination of inclusive implementation also found that teachers' confidence in their collective efficacy was most evident in discussions of practices to change or modify student behaviour for students with learning disabilities.

Other positive factors resulting from a sense of CTE included commitment to students and the teaching profession. Lee et al. (2011) used exploratory factor analysis to investigate the relationship between a professional learning community, faculty trust in colleagues, teachers' collective efficacy, and their commitment to students in a study involving 480 teachers in Hong Kong. The findings from Lee et al. (2011) indicated that "collective teacher efficacy could significantly and positively account for the school-level variances of teachers' commitment to students" (p. 820). Ware and Kitsantas (2007) also found that efficacy to enlist administrative support, influence decision making at school, and for classroom management was related significantly to teacher commitment in a study that involved over 25,000 teachers in the United States. In a collective case study, Ahuja (2007) investigated educators' perceptions of the factors that influence commitment to school success. Teacher and CTE were among the six themes identified.

Furthermore, when beginning teachers have a perceived sense of collective efficacy, they are less likely to leave the profession. Tiplic et al. (2015) examined factors affecting 227 beginning teachers' turnover intentions in 133 schools in Norway. Findings supported the researchers' hypothesis that strong CTE would result in greater teacher retention. The researchers noted that "the results indicate that beginning teachers are less likely to develop thoughts about leaving their profession or workplace when they perceive that efforts are being made by the teacher team at their school as a whole" (p. 461).

Additional positive consequences resulting from collective teacher efficacy

With one study (Viel-Ruma et al. 2010) as an exception, CTE resulted in greater job satisfaction and reduction in teachers' stress and burn-out. Caprara et al. (2003a) found that collective efficacy beliefs were a main determinant of teachers' job satisfaction in 103 junior high schools in Italy. Klassen et al. (2010) confirmed their hypothesis that CTE would be positively related to job satisfaction across settings in a study that included teachers from Canada, the United States, and Korea. In addition, in a study that took place in Canada with 951 elementary and secondary school teachers, Klassen (2010) found that CTE not only predicted job satisfaction, but that it could lower teachers' stress attributed to student behaviour. Finally, Caprara et al. (2003b) concluded that collective efficacy beliefs represented "determinants of affective commitment and job satisfaction for teachers" (p. 15). However, Viel-Ruma et al. (2010) found that only individual efficacy, not CTE, served as a significant predictor of job satisfaction for special education teachers.

In addition to the studies examining CTE and job satisfaction, two studies examined the relationship between CTE and burnout. Avanzia et al. (2015) reported on a study of 192 high school teachers in Italy. The researchers found that when teachers strongly identified with a social group, social support related strongly to a positive sense of CTE, which in turn represented an important resource to dealing with stressors. Lim and Eo (2014) noted that CTE was negatively associated with lower levels of teacher burnout in a study that involved Korean middle school teachers, stating that "when teachers perceived their school's capability as a whole to be higher, they were more unlikely to get burnout" (p. 144).

Rauf et al. (2012) examined the influence of school culture on professional development in the Malaysian school context. The researchers included CTE as one of the five constructs of school culture. The others included trust, academic optimism, control, and communication. Moving toward designing more effective professional development that took place over a long period of time and incorporated research about what is known about how people learn, the researchers were interested in the correlation between school culture and the management of professional development in schools. Rauf et al. (2012) noted that CTE, as a construct of school culture, was a predictor of professional development in secondary schools. In other words, CTE positively influenced teachers' attitudes regarding professional development planning.

In another study examining school culture in both Singapore and Canada, Klassen et al. (2008) found the strongest predictor of culture perceptions was students' socio-economic status. In Singapore, this perception was mediated by CTE however, in Canada, it was not. The researchers employed a mix-method and noted that qualitative results suggested that the range of social problems was greater in Canada. Klassen et al. (2008) attributed Canadian teachers' lack of efficacy to the more serious social issues students were experiencing in Canada.

Urton et al. (2014) found that CTE played a decisive role in regard to teachers' attitudes toward remedial education. This study compared the attitudes of teachers who taught classes containing students with special education needs with those teaching classes containing students without special education needs. While

individual experience was a more important factor in regard to attitudes toward inclusive teaching than individual efficacy, the researchers noted that efficacy was gained through active experience in managing situations. Urton et al. (2014) concluded that "at the teaching staff level, collective efficacy, influenced attitudes towards remedial education" (p. 151).

Collective efficacy was negatively related to performance goal orientations in a study conducted in the United States, involving 156 high school teachers. Ciani et al. (2008) reported that in environments where performance-orientation goal structures were more prevalent, staffs demonstrated a lower sense of collective efficacy. Noting the distinction between mastery goal structures (where value is placed on learning and the development of competence) versus performance goal structures (where value is placed on high test scores, top grades, competition, and social comparison of ability), the researchers in this study found that perceived collective efficacy had a "significant negative direct effect on the performance-oriented classroom practices of high school teachers" (p. 553). In other words, in schools where CTE was present, performance goal orientations were less predominant.

Boberg and Bourgeois (2016) established a relationship between CTE and students' emotional engagement in a large scale, multisource research study in the United States. The researchers found that students who reported higher levels of emotional engagement were associated with teachers who reported higher levels of collective efficacy. An important conclusion drawn from this study was that "this relationship was especially important for mathematics achievement" (p. 369).

A number of research studies demonstrated a significant and positive relationship between collective efficacy and teacher efficacy. Goddard and Goddard (2001) were the first to explore how collective efficacy was related to teacher efficacy in a study that involved 438 elementary teachers in 47 schools in the United States. The researchers found that teacher efficacy was higher in the schools where collective efficacy was higher, even after accounting for the effects of prior achievement and socio-economic status. Additional empirical evidence, that collective efficacy predicted variation in teacher efficacy, has since been provided by a number of researchers in a variety of locations and settings. For example, Kurz and Knight (2003) found a positive, moderate relationship between the two constructs in a study of 113 high school teachers in the southwestern United States. Skaalvik and Skaalvik (2007) found that teacher efficacy was strongly related to perceived collective efficacy in a study that involved 2249 elementary and middle school teachers in Norway. Calik et al. (2012) found a positive and significant relationship between collective efficacy and teacher efficacy based on a sample of 328 primary school teachers in Turkey. Gibbs and Powell (2011) also found a significant relationship between collective and individual efficacy beliefs with respect to teachers' management of children's behaviour based on a study involving 197 teachers in England. The researchers noted that "teacher beliefs in their individual efficacy in the classroom appear to have been related specifically only to the corporate belief in the staff's efficacy for motivating children to learn" (p. 579). Garberoglio et al. (2012) examined teachers' self and collective efficacy beliefs related to teaching deaf students. The researchers found that the most significant

predictor of teachers' sense of efficacy in deaf education was teachers' perceived collective efficacy of the educational setting. The results from this study showed that "the teacher's beliefs of the collective ability of the educational setting to make an impact on student outcomes significantly influences beliefs of their individual ability to make a difference in student outcomes" (p. 378). Viel-Ruma et al. (2010) also found that CTE directly affected teacher self-efficacy. Tellez and Manthey (2015) found that teacher efficacy for teaching English language learners was related to CTE while controlling for teacher experience. Ciani et al. (2008) found that CTE was positively related to teachers' sense of efficacy in a study taking place in four high schools in the United States.

Discussion

Previous research has demonstrated that teachers' beliefs about their combined ability to positively influence student learning were predictive of increased student outcomes. The purpose of this study was to examine what is known about specific behaviours and other consequences that result from CTE in order to better understand the relationship between CTE and student achievement. Specifically, research was reviewed in search of answering the following two questions:

- What does the research tell us about the productive behaviours that result from collective teacher efficacy?
- What does research tell us about other consequences that result from collective teacher efficacy?

Peer-reviewed articles, written in English and published since 2000, were examined and 34 that met the inclusion criteria, were included in this review. Studies showed that CTE not only influenced productive teaching behaviours, it also resulted in more positive affective states. Specifically, CTE resulted in deeper implementation of school improvement strategies, increased teacher leadership, high expectations and a strong focus on academic pursuits, greater risk taking, and a receptiveness to new ideas on the part of educators. In addition, in schools where efficacy was present, teachers demonstrated greater commitment to students, it was less likely for students to be removed from classrooms and/or suspended from school as a result of misbehavior, and teachers were more likely to remain in the profession. Furthermore, CTE was predictive of positive feelings and attitudes. In all but one study, CTE was associated with greater job satisfaction and less stress. Where CTE was present, teachers had more positive attitudes toward professional development and toward teaching students with special education needs. Collective efficacy was negatively related to performance goal orientations and positively related to students' emotional engagement. Finally, in schools where CTE was strong, teachers tended to be more efficacious as well.

Attaining deep levels of implementation of research-based approaches and high-leverage strategies has proven problematic in educational settings. Findings from this review suggested that lack of implementation might be partly explained through

a collective efficacy framework. Successful educational reforms are defined by deep levels of implementation of what is known to work best in systems, schools, and classrooms. Policy makers, leaders, and staff developers' efforts toward successful reforms might be better served by strategically and intentionally considering how to foster CTE throughout the conceptualization, design, delivery, and assessment of change initiatives.

In regard to teacher leadership, studies showed that when educators share a sense of collective efficacy, teacher leadership is more prevalent in schools. Leading educational experts, including Hargreaves and Fullan (2012), advocate for increasing teachers' power to make decisions on issues related to school improvement as part of an effective change strategy. Increased teacher leadership appears to be one of the benefits resulting from teachers' shared perception that they can impact student outcomes over and above any other influence. This is yet, another compelling reason why it is important to consider how to foster CTE amongst educators.

A link between CTE and teachers' expectations has begun to be established based on the findings from this review. This is an important link when considering the factors that influence student achievement. In a synthesis of meta-analyses examining factors that influence student achievement, Hattie (2012) demonstrated that teacher expectations have a powerful influence on the success of student learning. Rosenthal and Babad (1985) found that teachers "obtain superior performance from students for whom they have more favorable expectations" (p. 38). Teachers with high expectations convey to students that teachers hold the belief they can attain high levels of performance based on challenging and appropriate goals. These beliefs result in self-fulfilling prophecies (Brophy and Good 1970; Rosenthal and Jacobson 1968). On the other hand, studies show that when teachers hold low expectations they employ inconsistent behaviour toward low expectation students including less wait time for students to respond and rewarding incorrect answers (Brophy 1983). Rubie-Davis et al. (2006) brought to light an additional concern related to teachers' expectations with the finding that when teachers hold lower expectations, they do so for *all* students in a class.

The negative relationship between CTE and performance goal orientations is noteworthy given that goal orientations directly affect classroom instruction and in turn, students' perceptions of what is important. Ciani et al. (2008) found that in schools where a performance goal orientation was valued, teachers' motivational beliefs were less adaptive and teachers experienced less of a sense of community within the school (community defined as trust, encouragement, collaboration, and administrative support). In addition, teachers' classroom practices were geared more toward performance oriented instruction. The caution here is that students' perceptions of teachers' instructional practices could have a direct effect on student motivation and students' goal orientations. Results from a study by Young (1997) showed that students who held performance focused goal orientations (e.g. concerned with achievement scores and out-performing peers) were more likely to utilize surface level processing strategies. In comparison, students who held mastery focused goal orientations (e.g. concerned with developing competencies) were more likely to utilize strategies that would lead to a deeper understanding. This

underscores the importance of the predictive relationship between CTE and mastery goal orientations.

Caution about the directionality of the variables included in this study is warranted. Most of the studies in this review were designed to let CTE predict variables; in other words, the causal direction was determined in advance. This is not coincidental since this review sought to identify the *consequences*, not the antecedents, of CTE. However, the relationships between the variables in many of the studies are likely bidirectional. For example, when considering the studies that demonstrated that teachers' self-efficacy beliefs were influenced by their beliefs about the faculty's capability, Goddard et al. (2004a) argued that the influence goes both ways. In schools where most teachers are confident in their own ability to reach students, it is likely that collective perceptions are strong and there are high expectations for success. In explaining the link between CTE and individual's sense of efficacy in schools, Goddard et al. (2004a) noted that the sources of efficacy "can act in concert at both the individual and organizational level" (p. 9). In addition, while this review included evidence that CTE resulted in deeper implementation, Sorlie and Ogden (2007) and Paxon et al. (2014) found that implementation quality impacted collective efficacy beliefs. Furthermore, while Wilcox et al. (2014) concluded that higher graduation rates resulted from a shared sense of collective efficacy, when examining CTE as the dependent variable, Goddard (2001) found that mastery experiences (defined as prior student achievement) predicted collective efficacy variation among 91 urban elementary schools. In addition, Ross et al. (2004) found that prior student achievement in grade 6 mathematics predicted CTE. Finally, when considering directionality of variables, a few of the studies in this review demonstrated that CTE resulted in positive affective states including greater satisfaction and reduced stress. Bandura (1977) demonstrated that affective states are one of the four sources that shape CTE.

Implications

This review helps to explain how CTE influences student achievement. Collective efficacy promotes a number of positive teaching behaviours and results in other positive consequences that in turn, impact student outcomes. There is a need for future reviews to examine what is known about the direction of the causal relationships amongst the variables highlighted in this study. Given the notion of reciprocal causality (Bandura 1997), it is likely that the antecedents and consequences of CTE mutually influence one another. In addition, there is a need to understand how the variables work together. Future research might look beyond bivariate relationships to examine the relationships *amongst* collective efficacy and multiple variables. Hoy et al. (2002) noted that often, what is neglected is an examination of variables as an explanatory system in how they work *together* to explain student achievement. Future reviews of research should also examine what is known about the relationship between leadership and CTE. If efficacy is going to be fostered in schools as a means of increasing student outcomes, insights into what is known about the relationship between CTE and leadership styles and practices is needed. Finally, even though the reciprocal relationship amongst CTE and the

variables summarized in this review has been acknowledged, future research is needed in gaining a better understanding of how CTE is shaped. What are the antecedents and enabling conditions for CTE to flourish? How do Bandura's (1977) sources that influence an individual's interpretation of their effectiveness apply at the collective level?

Limitations

One limitation is related to conceptualization and measurement concerns summarized earlier in this review. In only nine of the quantitative studies included in this review, scales that were deemed congruent with theory by Klassen et al. (2011), including Skaalvik and Skaalvik's (2007) scale and Tschannen-Moran and Barr's (2004) Collective Teacher Belief Scale (CTBS), were utilized to measure CTE. Three additional scales in studies, that were in alignment with current theory, included items that were phrased to represent individual's perception of the group (e.g. "We" rather than "I") and were future oriented. These included scales used by Caprara et al. (2003a), and Derrington and Angelle (2013). However, while the conceptual definitions of CTE in the studies included in this review were congruent with Bandura's definition, the measures used in many of the quantitative studies demonstrated less fidelity with the theory. For example, the most widely used measure, based on the studies in this review (13 of the 34 studies), was Goddard et al. (2000) and Goddard (2002) Collective Teacher Efficacy Scale (CTE-Scale). Klassen et al. (2011) noted that items in the CTE-Scale refer to environmental characteristics and focus on teachers' current abilities rather than forward-looking capabilities that are more congruent with theory. Similar to what Klassen et al. (2011) found in their review, other scales purporting to measure CTE in this study, strayed from theory-based understanding of the construct. For example, the scale used in the study by Urton et al. (2014) was Schwarzer and Jerusalem's (1999) General Self-Efficacy Scale which was described as assessing self-efficacy—not collective efficacy. As noted by Klassen et al. (2011), "findings from studies using flawed measures can lead to misleading conclusions" (p. 37). A strength of this review however, is that it included four qualitative studies, which are needed to help deepen understanding of the consequences of CTE.

Another limitation that influences the findings of this review is that the review was not exhaustive, and articles written in English with the search terms outlined did not capture the population of possible articles. Future reviewers may uncover new patterns in CTE research by searching non-English journals and by examining the range of work completed in graduate theses and dissertations.

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