

Principal Leadership to Improve Collective Teacher Efficacy

This manuscript has been peer-reviewed, accepted, and endorsed by the National Council of Professors of Educational Administration as a significant contribution to the scholarship and practice of school administration and K-12 education.



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The purpose of this study was to examine the relationships between, and predictive value of, select school and teacher characteristics, and collective teacher efficacy (CTE). CTE is a strong predictor of school and student outcomes that principals may target to minimize the continued strong influence of socioeconomic status. Results from this study suggest that prior levels of student achievement offer more value to practitioners to improve CTE in schools than the other school and teacher characteristics the author examined in this study. The author presents implications for practice and future research recommendations based on these results

Collective teacher efficacy (CTE) is “the perceptions of teachers in a school that the efforts of the faculty as a whole will have a positive effect on students” (Goddard, Hoy, & Woolfolk Hoy, 2000, p. 480). Researchers continue to report findings to suggest that CTE is a strong predictor of a school's overall level of academic achievement (Hoy, Sweetland, & Smith, 2002; Leithwood, Patten, & Jantzi, 2010; Moolenaar, Slegars, & Daly, 2012; Tschannen-Moran, Salloum, & Goddard, 2015), and some have reported that principals may target CTE to minimize the influence of various school level measures of socioeconomic status (SES) on achievement (Hoy, Sweetland, & Smith, 2002; Tschannen-Moran, Salloum, & Goddard, 2015). Bandura (1997) has written that efficacy may be improved in different settings via mastery and vicarious experiences, with verbal persuasion, and through emotional arousal; however, improving CTE in schools requires further inquiry (Goddard, LoGerfo, & Hoy, 2004). In an attempt to identify different leadership behaviors and tasks that might improve CTE, researchers have examined the influence of different principal leadership types, including transformational leadership (Leithwood, Patten, & Jantzi, 2010) and instructional leadership (Fancera & Bliss, 2011). Leithwood, Patten, and Jantzi (2010) provided evidence for behaviors associated with transformational leadership as a means to improve CTE, however, Fancera and Bliss (2011) reported little evidence of relationships between different instructional leadership functions and CTE. Still, Belfi, Gielen, De Fraine, Verschueren, and Meredith (2015) wrote that understanding how to enhance CTE will enable school leaders to further improve school and student outcomes in lower SES schools. Given the evidence for CTE as a school level variable and mechanism to attenuate the continued strong influence of school SES on academic achievement, there is a need to explore administratively mutable variables that practitioners may target to improve CTE, and continuing the line of inquiry on how principals can improve CTE is a worthwhile endeavor.

Purpose Statement

Local education agencies include a variety of school and teacher characteristics on annual school report cards, and the examination of one state’s annual school report card reveals at least three administratively mutable school and teacher characteristic variables that may serve as antecedents to improved CTE. Therefore, I framed the study to examine whether the selected administratively mutable school and teacher characteristic variables included in one state’s school report card are related with and predict CTE. The purpose of this study was to examine the relationships between administratively mutable school and teacher characteristics, and CTE, as well as to assess whether these administratively mutable characteristics predict CTE. The school and teacher characteristics under examination in this study include student attendance rate, percentage of teachers with advanced degrees, and prior mathematics achievement.

Figure 1 shows how I conceptualized CTE for this study. This framework includes the administratively mutable school and teacher characteristics, including student attendance rate (SAR), percentage of teachers with advanced degrees (TAD), and prior math achievement (PMA), and school SES to influence CTE. Findings from this study will inform scholars regarding the value of continuing this line of inquiry into administratively mutable school and teacher characteristics to improve CTE, and it will inform principals about their leadership efforts to target the selected school and teacher characteristic variables as antecedents to enhance CTE in their schools. These findings will also be useful to policy makers who focus on improving school and student outcomes to suggest changes to school leader preparation. The literature supports improving CTE to perhaps mitigate the influence of school SES while

positively influencing student achievement, however, this study addresses a gap in the research base with respect to specific school and teacher characteristic variables that principals may target as antecedents to enhance CTE.

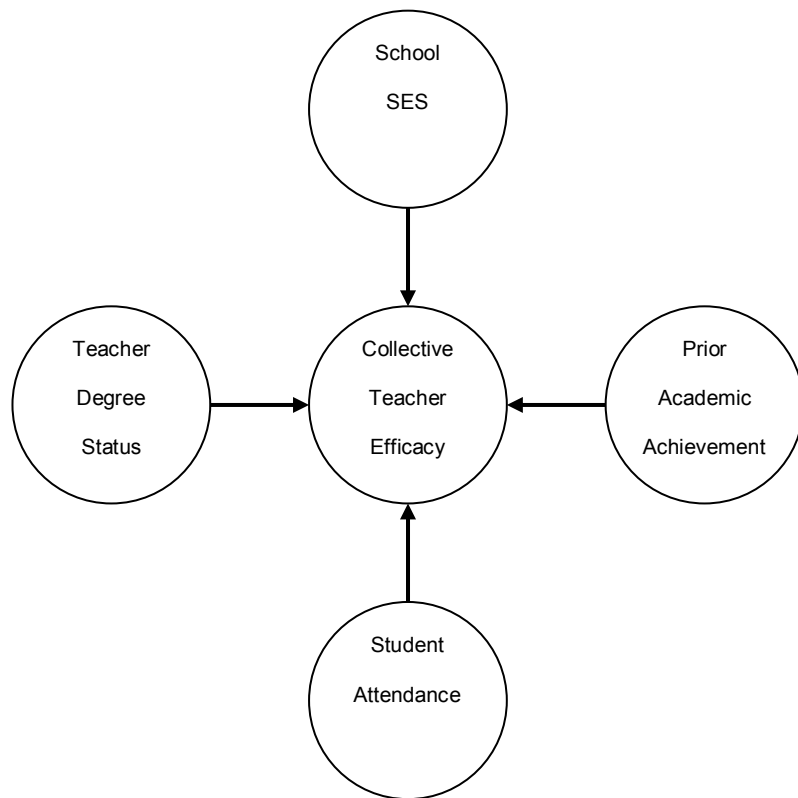


Figure 1: Study's Conceptual Framework

Research Hypotheses

To accomplish the purpose of this study, the following research hypotheses guided this inquiry.

- H₁: School and teacher characteristics, including student attendance rate (SAR), the percentage of teachers with advanced degrees (TAD), and prior mathematics achievement (PMA), are associated with collective teacher efficacy (CTE).
- H₂: School and teacher characteristics, including SAR, TAD, and PAM, predict CTE when modeled with school socioeconomic status.

Literature Review

Collective teacher efficacy (CTE) has been “conceptualized as the level of confidence a group of teachers feels about its ability to organize and implement whatever educational initiatives are required for students to reach high standards of achievement” (Leithwood, Patten, & Jantzi, 2010, p. 676). In one theoretical model of school achievement, which included school socioeconomic status (SES), academic press, and CTE, CTE was a stronger predictor of school achievement than school SES (Hoy, Sweetland, & Smith, 2002). The importance of this work has been to propose that principals can lead their schools to overcome district, school, and

student level indicators of SES by targeting CTE. Although researchers have reported evidence for transformational leadership practices to improve CTE (Leithwood, Patten, & Jantzi, 2010), there is a need to examine other mechanisms under leadership control that practitioners can target to improve CTE (Goddard, LoGerfo, & Hoy, 2004; Leithwood, Patten, & Jantzi, 2010).

Bandura (1997) has discussed how mastery and vicarious experiences, verbal persuasion, and emotional arousal are sources of information to improve one's sense of efficacy, and it is important for school leadership practitioners to embrace a variety of sources as they attempt to improve CTE (Kennedy & Smith, 2013). As an individual's sense of efficacy improves, the efficacy of the group follows. In schools, this implies that as individual teachers feel they are effective at teaching and improving student learning, the feeling of the faculty as a whole regarding their effectiveness improves (Calik, Sezgin, Kavgaci, & Kilinc, 2012; Katz & Stupel, 2015). Important to the study of school leadership is to uncover how principals can provide these sources of information (Bandura, 1997) to their faculties to develop efficacy as they attempt to improve CTE and subsequently school and student outcomes. Salanova, Martinez, and Llorens (2012) found that past academic success is a relevant predictor of future academic success. Practitioners may provide mastery experiences for teachers by celebrating their school's performance on a variety of outcome measures, including measures such as state assessment results, student attendance, and college acceptance. Principals may organize vicarious experiences for their faculties by encouraging them to pursue advanced degrees, modeling instructional strategies for teachers who have had challenges improving student achievement, permitting time for teachers to observe colleagues who have high levels of self-efficacy, and by arranging visits for their teachers to observe the instructional practices implemented in classrooms of high achieving students. Derrington and Angelle (2013) found that improved CTE happens in schools when teachers believe their colleagues behave in ways that promote student achievement. School leaders might also encourage lead teachers and administrators to model exemplary classroom instruction to teachers with lower levels of self-efficacy as another vicarious experience. "At a collective level, observing successful performances of colleagues within the group to which the observer belongs may enhance efficacy" (Zakeri, Rahmany, & Labone, 2016, p. 160). Communicating the school's goals, increasing the availability of professional development opportunities and workshops, supervising and evaluating instruction followed by constructive feedback of instructional methods, monitoring student progress, and maintaining high levels of visibility in the school are examples of leadership tasks that principals can use as forms of verbal persuasion to improve individual teacher efficacy and CTE. In an out of school context, Bruton, Mellalieu, and Shearer (2014) found that positive, neutral, or negative feedback can manipulate the collective efficacy beliefs of a group. To extend these findings to school settings, perhaps principals can provide teachers with sources of information to develop self-efficacy through mastery and vicarious experiences, as well as through verbal persuasion, to improve a school's CTE.

In the *Equality of Educational Opportunity* report (Coleman, Campbell, Hobson, *et al.*, 1966), the researchers reported that school socioeconomic status (SES) is one of the strongest predictors of student success, but they also suggested that teacher quality has a strong relationship with student achievement. More recently, Moolenaar, Slegars, and Daly (2012) reported that SES is related with math and language achievement. Others have supported these teacher quality findings by reporting that some school level variables, including teacher effects and their perceptions of effectiveness, are stronger predictors of school achievement than SES (Bandura, 1997; Hoy, Sweetland, & Smith, 2002; Leithwood, Patten, & Jantzi, 2010; Nye,

Konstantopoulos, & Hedges, 2004). It is reasonable to deduce from these previous studies that practitioners might consider engaging in leadership practices to improve teacher quality and instructional skills to improve the overall level of achievement of their schools. Principals can improve the quality of their faculties through various means, including hiring the best candidates to fill vacancies, implementing teacher induction and retention programs for newly hired and novice teachers, and by providing and supporting job embedded, on-going professional development opportunities to address areas of instructional need. These means to improve teacher quality, however, are often district level responsibilities, and the influence of building level leadership on this decision making process varies among school districts.

Past student performance on measures of achievement are likely to provide teachers with perceptions of their efficacy regarding the production of desired outcomes. As student performances improve or decline over time, a faculty's belief about its efficacy is likely to follow similar trends. This prior academic achievement is important in shaping collective teacher efficacy, and as such, provides mastery experiences. Principals can emphasize any improvements to bolster his or her faculty's belief that as whole, the teachers in the school are providing students with the learning experiences that elicit the desired student outcomes.

One route to improve teacher quality that is more directly under principal control than the previously discussed means is for principals to encourage teachers to pursue advanced degrees. While most school districts compensate teachers who hold an advanced degree, researchers who have studied the influence of teachers with advanced degrees on school and student outcomes is inconclusive (Wayne & Youngs, 2003). Some have reported little or no influence of teacher degree status on either national or statewide standardized test scores (Campbell & Lopez, 2008; Eide & Showalter, 1998), while others have found that teacher degree status matters for content specific areas, including mathematics and science (Goldhaber & Brewer, 1996). In their extensive review of research in this area, Wayne and Youngs (2003) indicated that teachers with advanced degrees in mathematics taught students who achieved at higher levels in mathematics than teachers who either held a non-mathematics advanced degree, or did not hold an advanced degree. Although their review did not suggest similar findings in other content areas, Wayne and Youngs (2003) concluded additional inquiries in this area are needed to further distinguish the influence of teacher degree status on school and student outcomes.

In practice, school and district leadership devote time to ensure that students attend school regularly. The accumulation of missed learning opportunities due to student absence from school is likely to have a detrimental influence on school and student outcomes, and the evidence supports this practice. In one urban school district, the frequency at which high school students attended school influenced mathematics achievement on a standardized test (Parke & Kanyongo, 2012). Additionally, achievement levels of elementary and middle school students were related with attendance at school (Gottfried, 2010). The evidence for a leadership focus on improving student attendance warrants additional examination of this school characteristic, especially when principals lead to improve CTE in schools.

Method

Sample

The school served as the unit of analysis for this correlational study. I collected data from a sample of New Jersey (NJ) high schools, which I defined as a NJ public school that meets the following criteria: it is included in the NJ School Report Card (NJSRC); it includes a grade 11

class; and it is categorized into one of eight socioeconomic categories called district factor groups (DFGs), determined by NJ Department of Education (NJDOE, New Jersey Department of Education, n.d.). The eight NJ DFGs include the following categories, A, B, CD, DE, FG, GH, I, and J. School district SES increases through the alphabetic categorization continuum. For example, the A-DFG represents school districts with the lowest levels of SES in NJ, while the J-DFG represents those school districts with the highest levels of SES in NJ. This study's convenience sample included 60 NJ high schools. This sample includes high schools from each of the eight DFGs and 19 of NJ's 21 counties. Table 1 and Table 2 represent the distribution of sample schools by DFG and NJ region, respectively. These data imply that this convenience sample overrepresented middle SES high schools from the central region of NJ.

Table 1

Distribution of Sample by New Jersey District Factor Group, (N = 60)

New Jersey District Factor Group	Number of Schools in Sample	% of Sample	% of Schools in Population
A	4	7	15
B	4	7	11
CD	2	3	9
DE	12	20	16
FG	16	27	14
GH	9	15	17
I	10	17	15
J	3	5	4

Table 2

Distribution of Sample by New Jersey Region, (N = 60)

New Jersey Region	Number of Schools in Sample	% of Sample	% of Schools in Population
Northern	25	42	48
Central	20	33	23
Southern	15	25	29

Data Collection

I accessed school report card data to quantify the four independent variables included in the conceptual framework depicted in Figure 1. I collected data from the NJSRC to measure the following predictors of collective teacher efficacy (CTE): student attendance rate (SAR); the percentage of teachers with advanced degrees (TAD); and prior mathematics achievement (PMA). I utilized the ENROLL data base to calculate the percentage of students in each sample school who qualified for free lunch (FL) to serve as a school level measure of SES.

I quantified the dependent variable, CTE, by administering the short version of the collective efficacy scale (CES, Goddard, 2002) to teachers from the sample schools via an online survey provider. CTE is dependent on the interaction of group competence, the ability of the

faculty as a whole to effectively instruct students to learn, and teaching task analysis, or teacher perceptions of students (Goddard, 2002). The CES (Goddard, 2002) measures the interactions that occur between group competence and task analysis to provide a school level measure of CTE (Goddard, 2002). Goddard (2002) and Goddard *et al.* (2000) have previously discussed the validity of the CES. In this study, I obtained a school level CTE score from teacher responses to the CES (Goddard, 2002). This instrument includes 12 Likert-type items that are scored on a six-point scale that ranges from “strongly disagree” to “strongly agree.” For each school included in the sample, I computed an average item score for each of the 12 items on the CES (Goddard, 2002) from the responses obtained from teachers in that school. Next, I summed average item scores and divided by 12 to calculate a school level CTE score for each high school included in the sample. In this study’s sample, Cronbach’s α for the 12 CES items was .82.

Data Analysis

I analyzed all data using OpenStat and computed and reported Pearson product-moment correlation coefficients (r) to determine relationships between each of the variables included in the conceptual framework. I also computed coefficients of determination (r^2) to report effect sizes for each of the relationships. In addition, I conducted a multiple regression analysis to determine whether SAR, TAD, PMA, and FL predict CTE. These analyses allowed me to draw conclusions relative to each of the study’s research hypotheses.

Limitations

The purpose of this study was to examine the relationships between administratively mutable school and teacher characteristics, and CTE, as well as to assess whether these administratively mutable characteristics predict CTE. I aggregated the percentage of teachers in a school who held either a master or doctoral degree, or multiple master or doctoral degrees, as their highest degree to examine the predictive nature of teacher degree status on CTE. The decision to aggregate teachers with either a master or doctoral degree, or multiple advanced degrees, as their highest degree earned into one variable, AdvDeg, limited my ability to report the variance accounted for by either a master or doctoral degree alone, or that of multiple advanced degrees. I made the decision to aggregate degree status to limit the number of independent variables included in the analysis to four given the number of schools included in the sample. Although the multiple regression analysis conducted for this study is limited by the sample of 60 high schools, I determined that the results are nonetheless worthwhile to principals who lead to improve CTE in their schools, as well as to scholars who continue to explore mechanisms that educational administrators can target to improve CTE.

Findings

I included a description of the sample schools in Table 1 and Table 2. Schools categorized in the mid-level DFGs comprised 47% of the sample (20% in DE and 27% in FG), and 33% of the sample was located in the central region of New Jersey. Table 3 displays the descriptive statistics for school SES, school and teacher characteristics, and CTE. The average school SES, as measured by the percentage of students in a school who received free lunch (FL), was 11.91% ($SD = 14.41$). Half of the teachers ($M = 50.09\%$, $SD = 12.84$) in these schools held an advanced degree (TAD), and the student attendance rate (SAR) in the sample averaged 94.18% ($SD = 2.47$).

Table 3
Descriptive Statistics

Variable	<i>n</i>	<i>M</i>	<i>SD</i>
1. FL	60	11.91	14.41
2. TAD	60	50.09	12.84
3. SAR	60	94.18	2.47
4. PMA	60	78.12	12.24
5. CTE	60	4.09	0.43

I computed correlation coefficients for all pair-wise combinations of variables, which are included in Table 4, to answer H₁. All variables were related with CTE in these sample schools, including FL ($r = -0.68, p < 0.01$), TAD ($r = 0.48, p < 0.01$), SAR ($r = 0.63, p < 0.01$), and PMA ($r = 0.74, p < 0.01$). The effect sizes of the correlations between FL and CTE ($r^2 = 0.46$), as well as PMA and CTE ($r^2 = 0.55$) suggests that a moderate amount of the variance of either variable is shared by the other variable, indicative of moderate practical value. On the contrary, the effect sizes of the correlations between TAD and CTE ($r^2 = 0.23$), and SAR and CTE ($r^2 = 0.40$) suggests that a low amount of the variance of either variable is shared by the other variable, indicative of lower practical value. The positive correlation between PMA and CTE indicates the influence of mastery experiences on a faculty's belief about their effectiveness, while the negative correlation between FL and CTE indicates that higher concentrations of student poverty influences a faculty to believe it is less effective at teaching and student learning, which is consistent with previous findings (Rubie-Davies, Flint, & McDonald, 2011).

Table 4
Correlations among Independent Variables and Collective Teacher Efficacy (CTE)

Variable	1	2	3	4	5
1. FL	-				
2. TAD	-.45**	-			
3. SAR	-.70**	.35*	-		
4. PMA	-.77**	.45**	.64**	-	
5. CTE	-.68**	.48**	.63**	.74**	-

Note: ** $p < .01$

A summary of the regression analysis that I conducted to answer H₂ is included in Table 5. PMA ($\beta = .45, p < .05$) emerged as the only variable included in the model to predict CTE, while FL ($\beta = -.13, p > .05$), AD ($\beta = .16, p > .05$), and SAR ($\beta = .20, p > .05$) did not predict CTE. The overall model fit was $R^2 = 0.62$.

Table 5
Summary of Regression Analysis

Variable	<i>B</i>	β	<i>t</i>	<i>p</i>
FL	-.004	-.13	-.86	> .05
TAD	0.01	.16	1.64	> .05
SAR	0.03	.20	1.66	> .05
PMA	0.02	.45	3.30	< .05

Note. $R^2 = .62, F(4, 55) = 22.0, p < .01$

In sum, I found that FL was negatively related with CTE, and that TAD, SAR, and PMA were positively related with CTE. As determined by effect sizes, I found that the relationships between FL and CTE, and PMA and CTE, offered more value to principals than either the relationships between TAD and CTE or SAR and CTE. PMA emerged as the sole predictor of CTE when modeled with FL, TAD, and SAR.

Implications for Practice

In light of the increasing evidence for collective teacher efficacy (CTE) as a school level variable to improve student outcomes (Hoy, Sweetland, & Smith, 2002; Leithwood, Patten, & Jantzi, 2010; Moolenaar, Slegars, & Daly, 2012; Tschannen-Moran, Salloum, & Goddard, 2015), it is important for researchers to continue to examine other school level variables that practitioners may target as antecedents to enhance CTE. I examined the relationships between administratively mutable school and teacher characteristics, and CTE in this study, and assessed whether these administratively mutable characteristics predict CTE.

A major goal of this study was to identify if school leaders can target any of the three administratively mutable variables that I examined to improve CTE, and prior academic achievement emerged as the most useful independent variable for this purpose. The relationship between prior academic achievement, as measured by prior mathematics achievement (PMA) in this study, and CTE was positive and offered a moderate effect to enhance CTE. Additionally, PMA emerged as the sole predictor of CTE in this study when modeled with free lunch (FL), percentage of teachers with advanced degrees (TAD), and student attendance rate (SAR), and these four variables included in the model accounted for 62% of the variation in CTE. Therefore, only prior academic achievement can serve as an antecedent to CTE that practitioners can target to enhance CTE in these sample high schools. This conclusion is consistent with that of other researchers who previously found that past academic successes can predict future academic success, thereby serving as a mastery experience for improved CTE (Salanova, Martinez, & Llorens, 2012). This conclusion is further supported by previous researchers who discussed the importance of mastery experiences as sources of information to improve efficacy beliefs (Calik, Sezgin, Kavgaci, & Kilinc, 2012; Derrington & Angelle, 2013; Katz & Stupel, 2015; Zakeri, Rahmany, & Labone, 2016). Bandura (1997) has written extensively on the topic of efficacy and the influence of mastery experiences as one of the strongest predictors of both self and collective efficacy. When an individual or group experiences success at a task, the individual or group has the belief that they will meet subsequent attempts at similar tasks with equal or greater levels of success. This concept of mastery experiences to influence efficacy beliefs holds in this study. PMA emerged as the sole predictor of CTE in these sample schools, which suggests that when students achieved at high levels on this state's standardized mathematics assessments, the

teachers in these schools believed that they and their colleagues were successful at delivering the curriculum and helping their students learn. So, school leaders who wish to enhance CTE in their schools must prioritize the recognition of prior academic successes to provide members of their school's faculty with the mastery experiences required to improve each individual's self and collective efficacy beliefs.

In the absence of the specific mastery experience of PMA, results from this study indicate the neither SAR nor TAD predict CTE. It may be prudent, however, for principals to continue to target SAR and TAD to improve CTE, because both variables in these sample schools were positively related with CTE and offered a moderate effect. That is, schools with higher student attendance rates were comprised of faculties that had higher levels of CTE, as did schools that had more teachers who held advanced degrees. Given these results, principal leadership to improve CTE should continue to consider the relationships between these school and teacher characteristics and CTE.

A troubling conclusion for practitioners who lead schools with high concentrations of student poverty that I can draw from these data and analyses is with regard to the strong, negative relationship between school SES, as measured by the percentage of students who qualify for free lunch (FL), and CTE. This relationship suggests that a school faculty's belief about their effectiveness at delivering classroom instruction and improving student learning is lower in schools that have higher percentages of students who qualify for free lunch. Principals in schools with higher concentrations of student poverty might do well to lead with a focus on positive feedback to manipulate the collective efficacy beliefs of the faculty, as described by Bruton, Mellalieu, and Shearer (2014) in a non-school setting. Principals in these schools might best serve their students and faculty by providing teachers with sources of information to develop self-efficacy through mastery and vicarious experiences, as well as through verbal persuasion, to improve a school's CTE.

Future Research Recommendations

Future work needs to continue to examine administratively mutable variables that principals can target as they lead to improve collective teacher efficacy (CTE) in their schools, because the evidence for the value of this variable to improve school and student outcomes is too strong for principals to not make it a leadership priority (Tschannen-Moran, Salloum, & Goddard, 2015). For practitioners, specific knowledge of school and teacher characteristics that are under leadership control that can serve as antecedents to enhance CTE is critical for higher levels of student learning, so future researchers should look to identify any such school level antecedent variables. Additionally, considering the relationship between teacher degree status and CTE that I found in this study, future work is needed to examine if the type of advanced degree, master versus doctoral or content specific versus non-content specific, matters with respect to improving CTE.

References

- Bandura, A. (1997). *Self-efficacy: The exercise of control*. W. H. Freeman and Company, New York, NY.
- Belfi, B., Gielen, S., De Fraine, B., Verschueren, K., & Meredith, C. (2015). The missing link between schools' socioeconomic composition and collective teacher efficacy. *Teaching and Teacher Education, 45*, 33-44.
- Bruton, A. M., Mellalieu, S.D., & Shearer, D. A. (2014). Observation interventions as a means to manipulate collective efficacy in groups. *Journal of Sport & Exercise Psychology, 36*, 27-39.
- Calik, T, Sezgin, F., Kavgaci, H., & Kilinc, A.C. (2012). Examination of relationships between instructional leadership of school principals and self-efficacy of teachers and collective teacher efficacy. *Educational Sciences: Theory and Practice, 12*, 2498-2504.
- Campbell, N. D. & Lopez, E. J. (2008). Paying teachers for advanced degrees: Evidence on student performance from Georgia. *The Journal of Private Enterprise, 24*, 33-49.
- Coleman, J. S., Campbell, E. Q., Hobson, C. J., McPartland, F., Mood, A. M., Weinfeld, F. D., & York, R. L. (1966). *Equality of educational opportunity*, U.S. Government Printing Office, Washington, DC.
- Derrington, M. L. & Angelle, P. S. (2013). Teacher leadership and collective efficacy: Connections and links. *International Journal of Teacher Leadership, 4*, 1-13.
- Eide, E. & Showalter, M. H. (1998). The effect of school quality on student performance: A quantile regression approach. *Economic Letters, 58*, 345-350.
- Fancera, S. F. & Bliss, J. R. (2011). Instructional leadership influence on collective teacher efficacy to improve school achievement. *Leadership and Policy in Schools, 10*, 349-370.
- Goddard, R. (2002). A theoretical and empirical analysis of the measurement of collective efficacy: The development of a short form. *Educational and Psychological Measurement, 62*, 97-110.
- Goddard, R. D., Hoy, W. K., & Woolfolk Hoy, A. (2000). Collective teacher efficacy: Its meaning, measure, and impact on student achievement. *American Educational Research Journal, 37*, 479-507.
- Goddard, R. D., LoGerfo, L., & Hoy, W. K. (2004). High school accountability: The role of perceived collective efficacy. *Educational Policy, 18*, 403-425.
- Goldhaber, D. D. & Brewer, D. J. (1996). Evaluating the effect of teacher degree level on educational performance. Westat, Inc., Rockville, MD, available at: <http://files.eric.ed.gov/fulltext/ED406400.pdf> (accessed July 24, 2015).
- Gottfried, M. A. (2010). Evaluating the relationship between student attendance and achievement in urban elementary and middle schools: An instrumental variables approach. *American Educational Research Journal, 47*, 434-465.
- Hoy, W. K., Sweetland, S. R., & Smith, P. A. (2002). Toward an organizational model of achievement in high schools: The significance of collective efficacy. *Educational Administration Quarterly, 38*, 77-93.
- Katz, S. & Stupel, M. (2015). Enhancing collective-efficacy in mathematics through cooperative implementation of a multiple solution task in a higher education classroom: A qualitative action research. *Education, 5*, 98-110.

- Kennedy, S. Y. & Smith, J. B. (2013). The relationship between school collective reflective practice and teacher physiological efficacy sources. *Teaching and Teacher Education, 29*, 132-143.
- Leithwood, K., Patten, S. & Jantzi, D. (2010). Testing a conception of how leadership influences student learning. *Educational Administration Quarterly, 46*, 671-706.
- Moolenaar, N. M., Slegars, P. J. C., & Daly, A. J. (2012). Teaming up: Linking collaboration networks, collective efficacy, and student achievement, *Teaching and Teacher Education, 28*, 251-262.
- New Jersey Department of Education. (n.d.). *District Factor Groups (DFG) for school districts*. Retrieved November 9, 2016, from <http://www.state.nj.us/education/finance/rda/dfg.shtml>
- Nye, B., Konstantopoulos, S., & Hedges, L. V. (2004). How large are teacher effects? *Educational Evaluation and Policy Analysis, 26*, 237-257.
- Parke, C. S. & Kanyongo, G.Y. (2012). Student attendance, mobility, and achievement in an urban school district. *The Journal of Educational Research, 105*, 161-175.
- Rubie-Davies, C. M., Flint, A., & McDonald, L. G. (2011). Teacher beliefs, teacher characteristics, and school contextual factors: What are the relationships? *British Journal of Educational Psychology, 1-19*.
- Salanova, M., Martinez, I. & Llorens, S. (2012). Success breeds success, especially when self-efficacy is related with an internal attribution of causality. *Estudios de Psicología, 33*, 151-165.
- Tschannen-Moran, M., Salloum, S. J., & Goddard, R. D. (2015). Context matters: The influence of collective beliefs and shared norms. In H. Fives & M. G. Gill (Eds.), *International Handbook of Research on Teachers' Beliefs* (pp. 301-316). New York, NY: Taylor & Francis.
- Wayne, A. J. & Youngs, P. (2003). Teacher characteristics and student achievement gains: A review. *Review of Educational Research, 73*, 89-122.
- Zakeri, A., Rahmany, R., & Labone, E. (2016). Teachers' self- and collective efficacy: The case of novice English language teachers. *Journal of La*