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Teacher Efficacy and Student Achievement

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Teacher Efficacy and Student Achievement: An NeMTSS Research Brief

Key Points:

- Albert Bandura's (1977) posits that a person with high self-efficacy will invest their effort in completing a task if they believe they can take on the challenges before them and complete it successfully.
- John Hattie's work on collective teacher efficacy builds on Bandura's work and applies it to educators. Hattie believes that positively influencing the academic achievements of students starts with educators' beliefs in their ability to do so (Hattie, 2003).
- Robert Marzano is an educational researcher and in a 2001 study, found several school-based and teacher-based factors strongly influencing student achievement: cooperation, climate, monitoring, content coverage, pressure to achieve, and school leadership – which relate to concept of collective teacher self-efficacy.
- Various research studies have shown that collective teacher efficacy has an impact on student achievement. There is some debate on the true effect size of it, but generally, all studies in this document suggested that collective teacher/educator efficacy, and/or cohesive leadership of some sort has a positive effect on student achievement.

Albert Bandura: The Theory of Self-efficacy

Self-Efficacy is a belief in one's own ability to complete a task successfully (Bandura, 1997). The theory of self-efficacy grew out of Albert Bandura's work studying psychological processes behind behavior. Bandura proposed that people possess a central processor of efficacy information. In other words, people process, weigh, and integrate diverse sources of information concerning their capability, and then regulate their choice behavior and effort accordingly (Bandura, 1977). Bandura's (1977) theory posits that a person with high self-efficacy will invest their effort in completing a task if they believe they can take on the challenges before them and complete it successfully. The influence of self-efficacy in educational outcomes has garnered a large interest in the last few decades, as researchers have sought to find the relationship between student self-efficacy and academic achievement. Various studies have established student self-efficacy to be positively correlated with academic achievement (Çoğaltay & Karadağ, 2017; Adeyinka, Adediji, & Olufemi, 2011; Alivernini & Lucidi, 2011).

According to Bandura (1997) and Çoğaltay & Karadağ (2017) the bidirectional interaction between self-efficacy and achievement is also critical to cumulative development, wherein achievement in one area positively affects self-efficacy for similar experiences, this is discussed and depicted in Çoğaltay & Karadağ (2017). Bandura also proposed the concept of collective efficacy- where self-efficacy is interpreted on a group level. Collective efficacy is the group-wide belief that the sum of the abilities of group members can effectively organize and execute the action plans to achieve specific goals (e.g., student achievement; Bandura 1993;1997). This concept of collective efficacy serves as the foundation on which researchers have attempted to measure the relationship of educators' collective efficacy and student achievement.

John Hattie: Collective Teacher Efficacy

John Hattie's work on collective teacher efficacy builds on Bandura's work and applies it to educators. Hattie believes that positively influencing the academic achievements of students starts with educators' beliefs in their ability to do so (Hattie, 2003). According to Hattie, setting expectations for formal, frequent, and productive teacher collaboration while fostering trust, social sensitivity, and empathy are critical to influencing collective efficacy within schools. Hattie (2003) recognized collective teacher efficacy as a greater predictor of student achievement than socioeconomic status, home environment, and parental involvement. He gained a considerable amount of attention after his Visible Learning research what identified teacher- based influences to be most predictive of student achievement (Hattie, 2009). According to Corwin Visible Learning Plus (2019), an ongoing branch of his 2009 research, collective teacher efficacy is reported as having an effect size of 1.39. In other words, collective teacher efficacy has the potential to raise achievement by 1.39 standard deviations. While this seems like a promising effect, it should be noted that this was calculated by synthesizing the results of only 2 different meta-analyses with 3,489 students. Additionally, the overall confidence in this effect size is reported as a 2 on a scale of 1-5, meaning there is a low confidence factor in the reported statistic (Corwin Visible Learning Plus, 2019).

More on Teacher Self-Efficacy and Student Achievement

Research has shown that teachers with high self-efficacy are generally more motivated in their work, are organized, have successful interpersonal relations, spend more time with students, and make a better contribution to students' achievement (Gibson and Dembo 1984; Tschannen- Moran et al. 1998; Tschannen-Moran and Barr 2004). At a group level, it seems like this finding is similar. There is evidence showing that a perception of collective efficacy is strongly associated with student achievement (Alinder 1994; Bandura 1993; Goddard 2001; Tschannen- Moran and Barr 2004).

In a meta-analysis done by Çoğaltay and Karadağ (2017) the effect size of collective teacher efficacy on student achievement was .52. Specifically, the level of effect of collective teacher efficacy on student achievement was calculated as .54, .61, and .50 for math, reading, writing and English courses respectively. All effect sizes were significant at a level of $p < .05$. This finding suggests that the joint competency belief level of teachers working in the same school can predict student achievement. Çoğaltay and Karadağ (2017) claim that teachers from schools with higher belief levels set more challenging long-term goals, are not easily discouraged, and do not consider demographic variables like SES status or race as reasons of failure. Because the findings relied on correlational methods, the directionality of the relationship is not completely clear. Another limitation to note on the research used in this meta- analysis is that the emergence of collective teacher efficacy in the schools was not studied. Therefore, additional research is needed to investigate the process of fostering collective teacher efficacy, and how student achievement in schools that do not have a strong collective teacher efficacy compared to those that do.

Robert Marzano: Teacher Efficacy and Student Achievement

Robert Marzano is an educational researcher best known for his work on standards-based assessment, high-yield teaching strategies, school leadership, and evidence-based education. His work has also examined the role of school-based and teacher-based factors on student achievement. In a large study synthesizing 40 years' worth of research to investigate the characteristics of effective schools and effective teaching, Marzano (2001) found several

school-based and teacher-based factors strongly influencing student achievement. School-based factors identified as having a statistically significant relationship to student achievement were: Cooperation (i.e. the quality and frequency of meetings between staff, and extent to which staff cooperation was an explicit goal), climate (i.e. school safety measures and positive interactions among staff and students), monitoring (i.e. strong emphasis on assessment and basing instruction on results and judgements about student learning), content coverage (the extent to which the curriculum is addressed by teachers), pressure to achieve (i.e. high expectations for all students and progress monitoring), and school leadership (i.e. the extent to which a school has strong administrative leadership relative to the goal of academic achievement).

Another study of his investigating the role of administrator leadership on student achievement and found that district-level leadership had a statistically significant relationship ($r = .24$) with student achievement. This can be related to the idea of collective teacher efficacy in that a cohesive leadership at a district level could foster cooperation and collective teacher efficacy to then influence students.

In addition to cohesive leadership in educators, Marzano (2001) researched teacher-level categories of influences that contributed to student achievement and identified three: (1) instruction, (2) curriculum design, and (3) classroom management. In a meta-analysis of research on instruction, Marzano (1998; 2000:2001) found nine categories of instructional variables influential to achievement (Table 1).

Table 1. Categories of Influences Contributing to Student Achievement

Category	Effect Size
Identifying similarities and differences	1.61
Summarizing and note taking	1.00
Reinforcing effort and providing recognition	.80
Homework and practice	.77
Nonlinguistic representations	.75
Cooperative learning	.73
Setting goals and providing feedback	.61
Generating and testing hypotheses	.61
Activating prior knowledge	.59

From Marzano (2001)

Hattie vs. Marzano and Teacher Efficacy

The work John Hattie and Robert Marzano have been influential in the training of teachers and exploration of evidence-based practices. However, both researchers have developed their own conceptualizations of the teacher-driven influences that impact student achievement. Nevertheless, Killian (2015) compared both researcher's strategies for effective teaching and developed 8 that both agreed on:

- 1. Provide a Clear Focus.**
 - Hattie emphasizes teacher clarity in effective classroom instruction.
 - Marzano suggests communicating explicit lesson goals.
- 2. Provide Overt Instruction.**
 - Both Hattie and Marzano agree that:
 - Learning objectives should be clearly communicated.
 - Teaching and instruction should be explicit and should include examples and non-examples.
 - Curriculum should have built-in cumulative practice.
- 3. Facilitate student engagement with lesson content.**
 - Marzano and Hattie both agree that curriculum should engage students on a surface level and a deep level. Teachers can facilitate surface level engagement by adding to information they already know and/or clarifying faulty assumptions students might have on the topic in order to have them link prior knowledge to new concepts. Teachers can engage students at a deeper level by exploring relationships between knowledge by using visual aids, analogies, and concept maps.
- 4. Give Feedback.**
 - Both Marzano and Hattie claim that highlighting what is right and wrong or good and bad about their work and helping students see areas of improvement is vital to learning.
 - Hattie believes that teachers should use student's results as feedback on their teaching and adjust accordingly.
 - Marzano believes that novice or struggling students benefit most from immediate feedback while more experienced and capable students benefit from delayed feedback.
- 5. Provide Multiple Exposures.**
 - Both Marzano and Hattie agree that students should be exposed to new material multiple times and have the opportunity to rehearse and review the material.
 - Hattie stresses the importance of spaced practice and feedback after practice so that students do not internalize the wrong information.
- 6. Facilitate the application of knowledge.**
 - Marzano found that deductive thinking helps students generalize their learning beyond the task at hand. He advocates teaching students how to think deductively and guiding them through the process of deductive thinking.
 - Both Hattie and Marzano believe that problem solving is important in stimulating learning and generalization of learned knowledge.
- 7. Get students working together.**
 - Both Hattie and Marzano believe that cooperative learning groups can enhance learning if (a) they're structured, (b) they're small, and (c) students have been taught how to work in small groups.
 - However, neither Marzano nor Hattie believe that it should replace whole-class instruction or individual learning activities.
- 8. Build students' self-efficacy.**
 - Hattie and Marzano have found that student self-efficacy has a substantial effect on achievement. They believe teachers should provide genuine praise and refer to specific accomplishments related to the task to encourage growth in student self-efficacy.

Conclusion

Various research studies have shown that collective teacher efficacy has an impact on student achievement. There is some debate on the true effect size of it, but generally, all studies in this document suggested a strong positive effect of collective teacher efficacy on student achievement/academic achievement. It is difficult to design a study in which collective teacher efficacy is experimentally tested, so although most studies were limited to using correlations and effect sizes, they still had promising results that should be valued in educational contexts. It is possible that collective teacher efficacy positively influences student achievement, and/or student achievement influences collective teacher efficacy to create a positive feedback loop. However, further research would need to be conducted to identify the details and directionality of the relationship. It is also possible that collective teacher efficacy drives or is driven by multiple factors like better organization, high expectations for students, and greater motivation, which have all been found to impact student achievement (Gibson and Dembo 1984; Tschannen-Moran et al. 1998; Tschannen-Moran and Barr 2004; Marzano, 1998). The development of these characteristics as well as skilled teaching practices referenced in Hattie and Marzano's work could also contribute to collective efficacy and vice versa. While there is still research to be done on this topic, it is important to note that all studies referenced in this summary shared the consensus that collective teacher/educator efficacy, and/or cohesive leadership of some sort had a positive effect on student achievement.

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