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The Impacts of Peer Observation Roles and Teaching Characteristics on Teacher Self-Efficacy: A Secondary Data Analysis Study Using the TALIS Survey

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Abstract

It is important for teachers to have a high sense of self-efficacy, as it is one of the prime motivational forces influencing student learning, teacher quality, and in turn, overall success (Curry, 2015; Hattie, 2009; Klassen & Chiu, 2010). Teachers with high self-efficacy work harder, are more involved in learning, and have higher assurance (Bandura, 1994). For these reasons, it is imperative to study the influencers of teacher self-efficacy. Peer observations and observational feedback, a highly used practice in all schools, is one of those influencers. This cycle of observations and feedback provided to teachers is influential to teacher self-efficacy (Akkuzu, 2014; Tschannen-Moran & Woolfolk-Hoy, 2007). Therefore, a secondary data analysis utilizing the TALIS teacher survey was conducted to further examine the relationships between the dependent variable of teacher self-efficacy in the domains of classroom management, instruction, student engagement, and overall, and the independent variables of a teacher's role in peer observations, teacher age, teacher gender, and teacher years of experience.

Findings indicated that female teachers had higher self-efficacy in all domains. Self-efficacy levels in all domains increased with age and years of teaching experience, but notably decreased for those with the most experience. Overall, self-efficacy levels were at its height when a teacher was between the age of 40 through 49 or older than 60. Teachers also had the highest self-efficacy levels in all domains when a teacher had between 21 and 25 years of experience. Furthermore, teachers who were observers in peer observations had higher levels of self-efficacy than teachers who did not observe any peers. Contrastingly, teachers who were observed through peer observations had lower levels of self-efficacy than teachers who were not observed.

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To Carly, your story is the fuel that pushes me to keep fighting for students who deserve better. Because of you, I continue to stretch myself to have courageous and compassionate conversations, and to always take the time to learn someone's story.

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Chapter 1: Overview of the Study

Introduction

An extensive body of research exists on self-efficacy and its relation to success in the workplace. In education, teacher self-efficacy has been the focus of various studies and has been linked to job satisfaction and student achievement (Tschannen-Moran & Hoy, 2001). In order to fully understand self-efficacy as it relates to teachers, it is important to have a clear definition of social cognitive theory as described by Bandura (2012) who wrote that

> human functioning is a product of the interplay of intrapersonal influences, the behavior individuals engage in, and the environmental forces that impinge upon them. Because intrapersonal influences, in which self-efficacy is a constituent, are part of the determining conditions in this dynamic interplay, people have a hand in shaping events and the course their lives take (p. 11).

Bandura goes on to point out that social cognitive theory can be used to explain how one's self-efficacy originates. Additionally, he notes that an individual's surroundings can have a profound impact on her beliefs. In particular, the human contacts that we establish throughout life exert influence on us and can impact one's self-efficacy. In education, one of those relationships is that of the teacher and her colleagues; specifically, through the practice of peer observations.

It is important for teachers to have a high sense of self-efficacy, as it is one of the prime motivational forces influencing student learning, teacher quality, and in turn, overall success (Curry, 2015; Hattie, 2009; Klassen & Chiu, 2010). Teachers with high self-efficacy work harder, are more involved in learning, and have higher assurance (Bandura, 1994). For these

reasons, it is imperative to study the sources of teacher self-efficacy. One such source is observational feedback, a highly used practice in schools. Observational feedback provided to teachers from their peers is one of the ways to impact student learning and teaching practices, which ultimately influences student achievement (Bell, 2005; Bell & Mladenovic, 2008). This cycle of observations and feedback provided to teachers by peers is influential to teacher self-efficacy (Akkuzu, 2014; Tschannen-Moran & Woolfolk-Hoy, 2007).

Background

As shown in various studies, self-efficacy has a positive relationship on effective teaching and student learning behaviors, therefore, increasing school outcomes (Holzberger, Philipp, & Kunter, 2013; Tschannen-Moran & Hoy, 2001). Teachers with higher efficacy levels have stronger beliefs in their ability to bring about student learning and hold students to higher expectations (Freeman, 2008). Therefore, to positively impact the teaching and learning environment, it is beneficial to identify ways to influence teacher self-efficacy.

Various studies show that when teachers engage with more accomplished peers, they develop ambitious instructional practices (Coburn & Russell, 2008; Elmore, 1996; Frank, Zhao, & Borman, 2004; Louis, Marks, & Kruse, 1996; Newmann, King, & Youngs, 2000; Penuel, Riel, Krause, & Frank, 2009; Rigby et al., 2017). Therefore, conceptually, peer observations have the ability to enhance teaching practices and student learning. Unfortunately, peer observations are not a highly studied area. This research will seek to provide educators with knowledge of the relationship between peer observations and teacher self-efficacy, as a means to inform educational practices in order to influence school outcomes.

Additionally, studying self-efficacy through the lens of domain thinking will allow this research to pinpoint the specific area of self-efficacy that is impacted the most by peer

observations. Domain thinking in terms of self-efficacy identifies three categories, which have been studied in past research: classroom management self-efficacy, instructional self-efficacy, and student engagement self-efficacy (Bandura, 1997; Klassen & Chiu, 2010; Tschannen-Moran and Hoy, 2001). The current study will also focus on these three domains of teacher self-efficacy, specifically as it relates to the various independent variables of peer observations, years of teaching experience, age of the teacher, and gender of the teacher.

Statement of the Problem

Although the study of teacher self-efficacy dates back to the 1970s starting with the Research and Development (RAND) organization, little is known about the topic. Klassen et al. (2011) studied teacher self-efficacy from 1998 to 2009 and argued the attention paid to teacher self-efficacy is insufficient. Additionally, very few studies explored the impacts of teacher self-efficacy (Klassen, Tze, Betts, & Gordon, 2011; Curry, 2016). Although mastery experiences, verbal persuasion, vicarious experiences, and emotional arousal are found to be sources of teacher self-efficacy (Bandura, 1994; Tschannen-Moran & Hoy, 2001), more information is needed on the practical application (Klassen, Tze, Betts, & Gordon, 2011). Further research investigating these sources could assist in better understanding and explaining the development of teacher self-efficacy and may lead to practical knowledge on the enhancement of self-efficacy in teachers (Klassen, Tze, Betts, & Gordon, 2011). Specifically, this research could help leaders foster the development of teachers and positively impact teacher self-efficacy through peer observations, which could lead to enhanced school outcomes (Curry, 2015; Hattie, 2009; Klassen & Chiu, 2010). Albert Bandura, 1994, Tschannen-Moran & Hoy, 2001). Diane Ravitch (2016) states, “If you have a fever, you will not get better if you take your temperature more frequently”. Instead, educators must find ways to enhance the teaching and learning experience.

Studying teacher self-efficacy as it relates to teacher characteristics and peer observations will offer insight into practical applications that can be used in schools.

Purpose of the Study and Significance

This study will seek to explore the relationship between participation in peer observations and teacher self-efficacy levels. This study is critical for both teachers and educational leaders, as it strives to identify a practice that can be implemented in schools as a means of enhancing school outcomes through its influence on teacher self-efficacy. This knowledge can assist school leaders in not only understanding the relationship between teacher self-efficacy, a prime motivational influencer of student learning and instructional practices, and peer observations; but also identify the group of educators with potentially the lowest and highest efficacy levels based on their gender, years of teaching experience, role in peer observation, and age. Knowing the specific domain in which teachers need the most growth is beneficial to the development of instructional practices. By comprehending this relationship, school leaders can take more time to develop their teachers through observational feedback as a means of enhancing school outcomes.

Research Design

This study is a secondary data analysis using the 2018 Organization for Economic Co-operation and Development (OECD) Teaching and Learning International Survey (TALIS) to examine the relationships between teacher self-efficacy, peer observations, and various teaching characteristics (see Appendix A). The TALIS survey has eight sections: background and qualifications, current work, professional development, feedback, teaching in general, teaching in the target class, teaching in diverse environments, and school climate and job satisfaction. Teacher self-efficacy, the continuous dependent variable in the current study, is computed as a

composite score of three subcategories: teacher self-efficacy in classroom management, instruction, and students engagement. The various categories of self-efficacy will be studied for the relationship they have with years of teaching experience, teacher age, teacher gender, and their participation and role in peer observations.

Research Questions

To add to the research on teacher self-efficacy as it relates to observational feedback and teaching experiences, the current study will answer the following research questions:.

1. How does teacher self-efficacy vary by teacher characteristics (gender; age; years of teaching experience)?
2. How are teacher participation in peer observations as the observer and teacher self-efficacy related?
3. How are teacher participation in peer observations as the observed and teacher self-efficacy related?
4. How does teacher self-efficacy vary by observation role (observer vs. observed) while controlling for each teacher characteristic (gender; age; years of teaching experience)?

Assumptions and Limitations

The following assumptions were made in regards to the collection of data. The first assumption is that the data collected by OECD is valid and reliable. The second assumption is that the data file as reported in SPSS is accurate.

There are limitations to this study. First, the data was not designed to study the specific topic of this research. Although this is not a critical limitation, it is worth mentioning. Second,

the results of the TALIS questionnaire are self-reported. The data is only as accurate as the participants providing the answers.

Definition of Terms

Classroom instruction self-efficacy: A teacher's belief in his or her ability to effectively teach students content in a classroom setting.

Classroom management self-efficacy: A teacher's belief in his or her ability to control the classroom environment through the behaviors of students.

Peer observation: When teachers observe their colleagues instruct a classroom of students.

Peer observation observee/observed: The individual being observed by their colleague.

Peer observation observer: The individual performing the observation on a colleague.

Self-efficacy: A teacher's belief in his or her ability to organize and execute necessary steps and actions to successfully accomplish a specific task (Bandura, 1994; Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998; Barni, Danioni, & Benevene, 2019).

Self-efficacy composite/omnibus: A teacher's overall self-efficacy level in the categories of classroom management, student engagement, and classroom instruction.

Student engagement self-efficacy: A teacher's belief in his or her ability to hold the captive attention of students.

Chapter 2: Review of the Literature

Teacher Self-Efficacy

Defining Self-Efficacy

Derived from Bandura's social cognitive theory of behavioral change, teacher efficacy is a teacher's belief in his or her ability to organize and execute necessary steps and actions to successfully accomplish a specific task (Bandura, 1994; Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998; Barni, Danioni, & Benevene, 2019). Researchers have described self-efficacy as a cyclical relationship: Higher self-efficacy beliefs lead to greater effort and persistence, translating to better performance, leading to greater efficacy (Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998; Holzberger, Philipp, & Kunter 2013). Contrastingly, teachers with low self-efficacy experience greater difficulties in teaching, higher levels of job-related stress, and lower levels of job satisfaction (Klassen & Chiu, 2010).

Studies of self-efficacy should reflect a particular context or domain of functioning, rather than a global functioning (Bandura, 1997; Klassen & Chiu, 2010). A global measure may have a broader questioning technique such as, "How confident are you in your teaching ability?". Focusing on a particular domain allows the inquiry to be about a particular task (Klassen & Chiu, 2010). Tschannen-Moran and Hoy (2001) focused on three domains of teacher self-efficacy: implementing instructional strategies, managing student behaviors, and engaging students in the learning process. In the current study, there will be a focus on these domains of teacher self-efficacy.

Studying teacher self-efficacy dates back to the 1970s starting with the Research and Development (RAND) organization when they added two items to a questionnaire to investigate teacher beliefs in their ability to impact student achievement (Tschannen-Moran, Woolfolk Hoy,

& Hoy, 1998; Klassen, Robert, Tze, Virginia, Betts, Shea, & Gordon, Kelly, 2010). Since then, research focused on teacher self-efficacy has increased in popularity due to the relationship it has with job satisfaction, lower levels of job-related stress and ability to deal with student behaviors (Barni, Danioni, & Benevene, 2019). Overall, understanding the sources of teacher self-efficacy has proven to have positive implications for teacher well-being and overall school effectiveness (Barni, Danioni, & Benevene, 2019).

Sources of Teacher Self-Efficacy

Bandura (1994) continued his study of teacher self-efficacy by identifying four sources: (1) performance accomplishments (mastery experiences)- the actual performance of tasks; (2) verbal persuasion- direct encouragement from colleagues and supervisors; (3) emotional arousal- emotional or physiological response to behaviors; (4) vicarious experience- modeling by other colleagues. Through a lens of teaching, this translates into teacher self-efficacy being impacted by classroom experiences or student achievement, the observation of peers, the arguments of their colleagues, and the level of exhaustion that teachers feel (Ross, 1998). Mastery experiences can either build or inhibit a teachers' sense of self-efficacy (Mireles-Rios & Becchio, 2018). That is, through repeated success, especially when overcoming obstacles, self-efficacy beliefs heighten. However, if teachers interpret their performance negatively, self-efficacy may decrease (Bandura, 1997). Additionally, memories of a successful mastery experience demonstrated to be a strong influence on teacher self-efficacy (Klassen, Robert, Tze, Virginia, Betts, Shea, & Gordon, Kelly, 2010). With experience, teachers develop a relatively stable set of beliefs in their own abilities. When teachers have a positive experience, their belief in their abilities is heightened. The inverse is true; teachers who experience a negative occurrence will feel less assured in their abilities (Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998).

Verbal persuasion can be used to convince individuals that they have the capacity to achieve tasks they wish to accomplish (Mireles-Rios & Becchio, 2018). This is the most commonly used method due to its organic nature. Peer observations can positively influence teacher self-efficacy if the feedback they use accurately depict the performance (Mireles-Rios & Becchio, 2018). On the other hand, if teachers received minimal opportunities to receive feedback, it is likely to diminish their self-efficacy (Mireles-Rios & Becchio, 2018).

Emotional arousal is a source of self-efficacy that relates to the response from participants that may lead to negative thoughts and heightened fear of failure (Mireles-Rios & Becchio, 2018). Stressful situations when feel agitated or tense, have the ability to decrease self-efficacy. On the contrary, when teachers can reduce inhibitory emotional states related to a specific task, they will increase their sense of self-efficacy. This is important because the observation experience for teachers can be a stressful situation for some. Therefore, observers via their words and actions may enhance or inhibit the self-efficacy of teachers by influencing their emotional state (Mireles-Rios & Becchio, 2018). Physiological and emotional states which arise when dealing with challenging teaching situations proved to be a strong influence on teacher self-efficacy (Klassen, Robert, Tze, Virginia, Betts, Shea, & Gordon, Kelly, 2010).

Vicarious experiences are another source of teacher self-efficacy (Bandura, 1977). Observing the success of people with similar capabilities increases observers' beliefs that they too could master a similar task because they possess similar capabilities (Mireles-Rios & Becchio, 2018). Similarly, if a teacher has a positive or negative experience in terms of an observation and the feedback associated with it, vicarious experiences would enable another teacher to feel the same experiences associated with it, whether that develops or hinders their self-efficacy.

Therefore, administrators should understand the sources of teacher self-efficacy as a means to create a positive and impactful feedback experience for teachers through peer observation opportunities. Administrators can assist in the structure and outline of what peer observations look like in order to create a supportive environment. By doing so, teacher self-efficacy levels have the ability to increase, and consequently yield an effective teaching and learning environment for both students and teachers.

Teacher Self-Efficacy and Educational Outcomes

The Reciprocal Nature of Teacher Self-Efficacy

To increase the quality of instruction, which is instrumental for student and school achievement (Strong & Hindman, 2003), teachers must believe that they are capable of making a difference (Holzberger et al., 2013; Ross & Bruce, 2007). The effects of teacher self-efficacy on teacher quality and student achievement can be attested to several factors - (1) teachers are more likely to try new teaching ideas, including taking risks and performing difficult tasks; (2) teachers utilize classroom management approaches, which offer students more autonomy; (3) teachers meet the needs of individual students; (4) teacher behavior is altered by their efficacy and in turn enhances the beliefs of students' perception on their academic ability; (5) teachers are more persistent to help students become successful even when students fall short (Ross & Bruce, 2007). All of these attributes speak directly to teacher actions having an effect on student learning, and do not directly mention the actions of students. Therefore, the quality of instruction directly impacts student learning and achievement, and can be influenced by teacher self-efficacy (Bandura, 1997; Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998; Lohman, 2006; Holzberger, Philipp, & Kunter 2013; Curry, 2016).

Researchers have found that teachers with high self-efficacy work harder, are more involved in information learning activities, and are more persistent and less stressed (Bandura, 1997; Lohman, 2006; Holzberger, Philipp, & Kunter 2013; Curry, 2016). Additionally, teachers with high self-efficacy beliefs have been found to show effective classroom management, deploy more innovative teaching methods, set more rigorous learning objectives for students, and encourage student autonomy (Holzberger, Philipp, & Kunter 2013). Teacher quality is not only an outcome of teacher self-efficacy but also a source of teacher self-efficacy beliefs, making this a reciprocal relationship (Holzberger, Philipp, & Kunter 2013).

These beliefs were further proven in a longitudinal study where a significant positive correlation was found between teachers' self-efficacy beliefs and both the teacher and the student ratings of instructional quality at multiple measurement points (Holzberger, Philipp, & Kunter 2013). Specifically, teachers who reported high self-efficacy levels had higher cognitive activation, better classroom management, and more individual learning support for students (Holzberger, Philipp, & Kunter 2013). Contrastingly, teachers with low self-efficacy beliefs experience more difficulties in teaching, lower level of job satisfaction, and higher levels of job-related stress (Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998; Klassen, Robert, Tze, Virginia, Betts, Shea, & Gordon, Kelly, 2010).

Overall, teacher self-efficacy has an impact on the teaching and learning experience for teachers and students, as it pertains to the quality level of instruction. As noted, quality instruction is needed in order to increase student achievement and overall school outcomes.

Teacher self-efficacy and student learning

The teaching and learning experience is impacted by the quality of the teacher and the belief they have in themselves, more specifically teacher self-efficacy. Research needs to focus

on “how to effectively create schools in which leaders are responsible for, allow, and encourage all to know and have positive impacts on student learning” (Hattie, 2012, p. 156). This influences teachers’ instructional capacity and self-efficacy (Bandura, 1993). Studies have shown self-efficacy to have a positive relationship on effective teaching and student learning behaviors, which ultimately increases school achievement (Holzberger, Philipp, & Kunter, 2013; Tschannen-Moran & Hoy, 2001). On the other hand, low teacher efficacy leads to low student efficacy and low academic achievement, further declining teacher efficacy (Banduar, 1997; Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998).

In a longitudinal study conducted over a four year period (Armor, Conry-Oseguera, Cox, King, McDonnell, Pascal, Pauly, & Zellman, 1977), findings indicated that reading scores of Black students in grades three through five were linked to the self-efficacy of their teacher. In a separate study consisting of 302 seventh grade students (Hines, 2008), Black students performed better in math than students of other races when they were instructed by an efficacious teacher. On the other hand, Black students scored lowest among students of all races when they were instructed by low efficacious teachers (Hines, 2008). It is important to note that the race of the teacher in this research was not correlated to efficacy levels.

Students of teachers with high self-efficacy levels believe that their teachers care about them (Collier, 2005; Freeman, 2008). These teachers form bonds with their students built on trust, which guides instruction and discipline. Ultimately, this creates a genuine learning community built on connectivity and relationships where students learn to care for themselves and others (Freeman, 2008). The result of such a community is an increased self-efficacy for teachers, solidifying their commitment to improved job performance (Freeman, 2008). Students must believe that their teachers care, they have the ability to think independently and make their

own decisions, they receive relevant work, they have appropriate expectations placed on them, and consequences are fair and predictable (Barkley, 2006; Freeman, 2008). Overall, if students feel that they are a part of a caring learning environment, they are more likely to be engaged in school. Higher levels of engagement yields higher attendance and test scores, therefore, demonstrating the link between teacher self-efficacy and student achievement (Berkley, 2006; Freeman, 2008). With increased student engagement, which is influenced by teachers with high self-efficacy, students are more likely to complete school and be engaged in their learning producing higher achievement levels.

Additionally, teachers with higher levels of self-efficacy believe strongly in their ability to bring about student learning and hold students to high levels of expectations, which produces higher student achievement (Freeman, 2008). Simply put, teachers with high levels of self-efficacy produce higher performance, higher commitment and higher likelihood of retention. Lower self-efficacy levels lead to lower performance, lower commitment, and unlikelihood of teacher retention (Freeman, 2008). Teachers with higher self-efficacy believe that they positively impact student learning, leading to continuous adaptations of teaching strategies to best meet student needs (Freeman, 2008).

Teacher self-efficacy levels are also linked to student self-efficacy levels (Anderson Greene, & Loewen, 1988; Barkley, 2006) and is a predictor of student achievement on standardized tests (Barkley, 2006; Moore & Esselman, 1992). Efficacy beliefs of students, indicating their belief in their abilities to execute a task, is a powerful predictor of performance (Bandura, 1986; Barkeley, 2006). Therefore, teachers with high self-efficacy positively impact student outcomes by producing higher levels of efficacy in students, which ultimately results in positive performance.

Teacher self-efficacy and teacher characteristics

Teacher self-efficacy and years of experience in the classroom

A teacher's belief in his/her ability is determined by several factors, including teaching experience. Although Bandura (1997) hypothesized that self-efficacy beliefs remained stable, additional research has shown evidence indicating changes in efficacy levels across stages of a career (Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998; Klassen & Chiu, 2010), thus yielding various results among studies. Ghaith and Yaghi (1997) found negative correlations between years of experience and teacher self-efficacy while Ross, Cousins, and Gadalla (1999) found mixed support for the impact of experience on teacher self-efficacy. Both studies used modest sample sizes of 25 and 52 respectively.

Wolters and Daugherty (2007), who studied the teaching experience of over 1,000 U.S. teachers and self-efficacy levels, also found information to support a relationship between teaching experience and self-efficacy levels. When teachers were divided into four experience groups (<1 year, 1-5 years, 6-10 years, and 11+ years of experience), modest effects of experience on self-efficacy for instructional strategies and self-efficacy for classroom management was present. However, there are some limitations to this study (Klassen & Chiu, 2010).

To start, the relationship between teachers' self-efficacy and experience may not be linear. Woolfolk Hoy and Burke Spero (2005) found that teachers' efficiency levels rose and then fell over the course of three data collection points at the start of teachers' careers (Klassen & Chiu, 2010). Additionally, Wolters and Daugherty (2007) grouped teachers with more than 10 years of experience into a single group. By doing so, Wolters and Daugherty were not able to determine changes to teacher efficacy levels that may occur toward the end of their career. Since

about 60% of teachers have more than 10 years of teaching experience (Klassen & Chiu, 2010), this study missed a crucial factor in their research. In the current study, groupings will be adjusted so as to not fall into this same limitation.

More recently, Klassen and Chiu (2010) studied teacher self-efficacy levels and the relationship it has to years of teaching experience. Specifically, they found that teachers' self-efficacy in regards to classroom management increased with years experience from year zero to year 23. After year 23, classroom management self-efficacy started to decline (Klassen & Chiu, 2010). A teacher with 23 years of teaching experience averaged 76% higher classroom management self-efficacy than a first year teacher (Klassen & Chiu, 2010).

Teachers' years of experience was also linked to instructional self-efficacy. Instructional self-efficacy of teachers with 23 years of experience averaged 88% greater than that of new teachers (Klassen & Chiu, 2010). Teachers with 23 years of experience also exhibited higher self-efficacy levels in terms of student engagement, displaying 68% greater efficacy levels than new teachers (Klassen & Chiu, 2010).

Teacher self-efficacy may experience both increased and decreased levels through a teacher's career due to career events and challenges (Klassen & Chiu, 2010). Some teachers at mid-to-late career stages may experience lower self-efficacy levels and, therefore, scale back some of their career goals (Bandura, 1997). Experienced teachers often find it difficult to alter their efficacy beliefs as they have become solidified after years of teaching; while inexperienced and novice teachers usually find it easier to alter their efficacy levels (Berkley, 2006; Henson, 2002). Although efficacy levels may be impacted as teachers go through their career, verbal support from principals and vicarious experiences can heighten efficacy (Tschannen-moran et al., 1998). Overall, teacher self-efficacy levels are not static; rather, they rise and fall according

to personal attributes and interpretation of environmental circumstances (Klassen & Chiu, 2010), as levels increased from zero year to 23 years and then declined as years of experience increased past year 23 (Klassen & Chiu, 2010).

Prior to Klassen and Chiu's (2010) research, not many studies looked at the relationship between teaching experience and teacher self-efficacy (Klassen & Chiu, 2010), which leads to a need in the educational research community. The current study will add to this minimal research library by looking at how self-efficacy levels vary by the years of teaching experience. Tschannen-Moran et al. (1998) called for a need for more research on the malleability of teacher self-efficacy. Knowing if a teacher's self-efficacy beliefs change with their experience is crucial knowledge for educational leaders to have in order to grow and assist their teachers.

Teacher self-efficacy and gender

Similar to the study of teacher self-efficacy and years of experience, more research is needed to identify the relationship between gender and teacher self-efficacy. Various research shows inconsistent findings between gender and teacher self-efficacy levels in the categories of classroom management, instructional practices, and student engagement.

In a study consisting of 1,430 practicing teachers, Klassen and Chiu (2010) found that when compared to female teachers, male teachers average 5% higher classroom management self-efficacy levels. Female teachers were found to be more sensitive to externalizing behavior problems, specifically from adolescent male students, while male teachers assessed children's interpersonal behaviors as less problematic than female teachers (Hopf & Hatzichristou, 199; Klassen & Chiu, 2010). Although these findings were consistent with researchers Nejati, Hassani, and Sahrapour (2014) in their study involving 34 English as a Foreign Language (EFL) teachers in Karaj, it was inconsistent with the findings of Sarfo, Amankwah, Sam, and Konin

(2015) who used a sample of 259 male and 178 female teachers from both private and public high schools in Ghana.

In terms of instructional strategy efficacy levels, according to Sarfo, Amankwah, Sam, and Konin (2015), female teachers on average have better instructional strategy efficacy than male teachers. This was a consistent finding to the research conducted by Nejati, Hassani, and Sahrapour (2014) involving 34 EFL teachers. Klassen and Chiu (2010), however, did not report any significant difference between the efficacy levels of males and females as it related to instructional strategies. Again, these studies show inconsistent findings to demonstrate the relationship between teacher self-efficacy and gender.

Additionally, teacher self-efficacy as it relates to student engagement also had varied results. Sarfo, Amankwah, Sam, and Konin (2015) reported no significant difference in their findings pertaining to 259 male and 178 female teachers from both private and public high schools in Ghana. This finding was consistent with Klassen and Chiu (2010) who did not report a difference in student engagement efficacy levels for males and females. However, Nejati, Hassani and Sahrapour (2014) found that male and female teachers differed in terms of student engagement, where male teachers were better at student engagement.

Teacher self-efficacy and age

Similar to other research studying teacher self-efficacy and a human characteristic, the findings related to age and self-efficacy levels are conflicting. Bandura (1995) suggested that all people live differently and do not manage their lives the same. Therefore, age and self-efficacy would not be related, but the period in which they are living in their lives and how they manage themselves during those periods can influence self-efficacy (Bandura, 1995). Contrastingly, Ghanizadeh and Moafian (2009) found older teachers to have higher levels of teacher self-

efficacy. Furthering this inconsistency, other researchers found younger teachers to have higher self-efficacy levels than their older peers (Edward & Robinson, 2012; Smit & Bosscher, 1998), while others found no statistically significant relationship between age and self-efficacy beliefs (Hicks, 2012; Jenks, 2004; Tschannen-Moran, 2007).

Teacher Self-efficacy and Race

Research indicates that teacher-student relationships can differ depending on the race-ethnicity of the teacher and child (Ewing & Taylor, 2009; Kunemund, Nemer McCullough, Williams, Miller, Sutherland, Conroy, & Granger, 2020; Murray & Murray, 2004). There is not a large library of research conducted around race and teacher self-efficacy. Geerlings, Thijs, and Verkuyten (2018), are among the few researchers to study racial makeup and teacher self-efficacy levels; specifically racial mismatch between teacher and student and self-efficacy levels. The study, conducted across 18 schools located in urban and rural districts across the Netherlands, indicated that teachers felt less efficacious working with minority students than they did working with majority students.

Kunemund et al. (2020) conducted a study with early 148 childhood teachers and 465 children ages three to five. Of the teachers in the sample, 50.7% were African American and 49.3% were White. The students in the sample were 68.4% African American, 20.3% White, 6.2% Multiracial, 4.8% Latino, 0.3% Asian, and 0.3% Native American. Findings indicated that higher proportions of teacher-student racial mismatch were related to lower levels of classroom management self-efficacy, and in turn associated with increased teacher-student conflict (Kunemund et al. 2020).

In conclusion, there is a lacking database of research to connect a teacher's race and their self-efficacy levels. The TALIS survey does not report this information with the dataset;

therefore, it will not be analyzed in the current study, but should still be kept in mind for future studies.

Professional Learning and Peer Observations

Job-embedded professional learning is promoted in the field of education as an effective professional development opportunity (NIET, 2012; Staley, 2018), and can be described as an experience where teachers engage in practices that occur during their daily routines to further their instructional understanding and ability. Such activities have a positive impact on student achievement (Staley, 2018). Through professional learning, teachers identify their own needs and design their growth activities accordingly (Choi, 2013; Staley, 2018). Teachers place significant importance on the ability to collaborate with other educators. Additionally, in a study involving STEM (science, technology, engineering, math) teachers, educators believed that learning from others through peer observations was a valuable practice that they wanted to continue (Stanley, 2018).

Peer observations can take many different forms. Two examples of peer observations include, peer-to-peer observations, and instructional rounds. Peer-to-peer observations is when a teacher observes another teacher. At times, these observations can consist of a pre and post discussion where the teachers are able to dig into instructional strategies (Flom, 2014). Instructional rounds do not have the goal of providing teachers with feedback. Rather, the goal is for observing teachers to compare their own instructional practice with those of the teacher observed (Marano, 2011). These observations are then concluded with the team of observing teachers holding a discussion amongst themselves about their reflective thoughts (Marzano, 2011). Instructional rounds typically take place in small teams where peer-to-peer observations are typically done one-on-one, consisting of the observer and the observed. For the purpose of

this study, the term used is peer observations and the distinction between the type of peer observations is not made.

Peer observations - teachers observing teachers - is the most powerful way for teachers to improve their practice (Flom, 2014). However, peer observations must include more than simply observing. Both the teacher observing and the teacher being observed must share a focused line of inquiry and partake in pre and post discussions in order to get the most out of the experience (Flom, 2014). During these conversations observational feedback is shared by both the teacher being observed and the teacher observing.

Observational Feedback

Quality Feedback

Classroom observations and feedback are a long-standing and common instructional leadership routine of administrators (Horng, Klasik, & Loeb, 2010; May & Supovitz, 2011; Rigby, Larbi-Cherif, Rosenquist, Sharpe, Cobb, Smith, 2017; Supovitz, Sirinides, & May, 2010). Not as widespread is the practice of peer observations. Perhaps the most notable difference, aside from the individual doing the feedback, is that this type of observation is not evaluative, meaning it does not rate a teacher's instructional practice (Bell & Mladenovic, 2008; Lomas & Nicholls, 2005). Rather, peer observations are used to share instructional techniques and ideologies between teachers (Israel, n.d.). There is little research surrounding peer observations, let alone peer observations as it relates to teacher self-efficacy. This study will seek to fill those gaps to better understand the relationship between teacher self-efficacy and peer observations.

Feedback, regardless of who is providing it, must be of sound quality to have the utmost effect on the teaching and learning experience. Quality feedback is purposeful, discusses the task in depth, and provides strategies that can be effectively applied to one's work (Hattie & Timperley, 2007; Wiggins 2012). Additionally, making feedback goal-referenced; tangible and

transparent; actionable; user-friendly (specific and personalized); timely; ongoing; and consistent yield higher levels of positive impact (Wiggins, 2012).

Goal-referenced feedback means that teachers must have a professional goal that they are striving toward. Having tangible results of the goal assists in creating a useful feedback system. Making feedback tangible and transparent helps teachers perceive things they may not perceive when they are instructing (Feeney, 2007; Wiggins, 2012). Feedback to teachers must also focus on action. Observers should stick to the facts and use data instead of making inferences. This will allow teachers to use the data to come to their own conclusions, thus creating more buy-in and acceptance of the feedback (Wiggins, 2012). In order to take action and be able to reflect, teachers must receive feedback in a timely manner. Teachers must also be given opportunities to use the feedback they receive and continuously gain feedback on their instruction (Wiggins, 2012). For this to happen, feedback must be data driven and the data must be presented to the teacher, as opposed to making inferences from the data.

Furthermore, effective feedback should focus on three major questions: (1) Where am I going? (What are the goals?); (2) How am I doing? (What progress is being made toward the goals?); (3) Where to next? (What activities need to be undertaken to make better progress?) (Hattie & Timperley, 2007). Feedback provided to individuals should also be specific (Gutierrez, 2018) and derived from a credible source (Danielson, 2011). In a study examining teacher self-efficacy through administrator feedback, teachers shared that they wanted observers in their classroom providing instructional feedback on a more regular basis (Gutierrez, 2018). Teachers also stated that the manner in which observers provided feedback mattered (in person, email, paper, etc.). It can be theorized that if teachers want consistent feedback from administrators that they would also want consistent feedback from colleagues; keeping in mind that peer feedback

should differ by not being evaluative (Bell, 2005; Bell & Mladenovic, 2008). Overall, feedback has the ability to impact teacher quality and teacher self-efficacy (Hattie & Timperley, 2007; Wiggins 2012), therefore, making it imperative to provide high quality feedback to teachers.

Reciprocal Impacts

When the main focus of peer observations is to assist teachers in developing their teaching, the process is often conducted in a reciprocal exercise (Bell, 2005; Hendry & Oliver, 2012). This consists of staff observing each other, sharing their findings and insights, and providing mutual support. A key factor in peer observations is that the teacher being observed holds control, as their feedback is confidential solely to that teacher (Bell, 2005).

The traditional view of observational feedback is that the teacher receiving the feedback is the beneficiary. However, research points to a reciprocal relationship and impact between the teacher observer and the teacher being observed. Learning from watching a colleague teach can be just as, if not more, beneficial than being observed by a peer (Hendry & Oliver, 2012; Mousavi, 2014).

Observational Feedback, Instructional Improvement, and Self-Efficacy levels

Although there is research identifying teacher to student feedback and its effects on student learning, there is very little literature to support teacher to teacher feedback (Rigby et al., 2017). Despite the growing implemented practice of observation and feedback given to teachers, observational feedback as a source of teacher self-efficacy is not a highly studied area (Rigby et al., 2017). Regardless, observational feedback is conceptualized to impact teaching practices due to the growing body of research and evidence indicating that when teachers engage with more accomplished colleagues, they develop ambitious instruction (Coburn & Russell, 2008; Elmore, 1996; Frank, Zhao, & Borman, 2004; Louis, Marks, & Kruse, 1996; Newmann, King, & Youngs,

2000; Penuel, Riel, Krause, & Frank, 2009; Rigby et al., 2017). Additionally, evidence reveals that actionable new insights, related directly to classroom practice, amplifies teachers' opportunities to learn (Rigby et al., 2017). Overall, informal, ongoing feedback following observations of teachers promote reflection, communicate goals for classroom instruction, and encourage teacher growth by promoting professional development and teacher collaboration (Blase & Blase, 1999; Rigby et al., 2017). Without objective and regular feedback, teachers are less likely to learn, apply and evaluate new strategies and instructional practices, and will not create impactful and meaningful goals for their own professional growth (Birringer-Haig, 2014).

John Hattie (2009) researched influencers of student learning outcomes by utilizing more than 800 meta-analyses based on 240 million students. An average effect size of 0.40 increased learning for one year of student achievement. Using this, Hattie (2009) ranked the influencers from greatest impact to least. The feedback that teachers receive had an effect size of 0.75, which was significantly higher than what is expected for average growth. When feedback is purposeful, discusses tasks in depth, and provides strategies that can be effectively applied to one's work, it has the most impact on teacher implementation and student achievement (Hattie, 2009).

The effects of feedback depend on the reactions of the recipient (Birringer-Haig, 2014). As previously explained, mastery experiences, verbal persuasion, vicarious experiences, and emotional arousal are sources of teacher self-efficacy (Bandura, 1994; Tschannen-Moran & Hoy, 2001) and play a role in the feedback cycle. Peer observations improve teaching practices and develop the confidence to teach and learn more about teaching (Bell & Mladenovic, 2008). It is conceptualized that this increased confidence and improvement of teaching increases mastery experiences and emotional arousal, therefore, impacting self-efficacy levels. Additionally, observing the instructional practices of others can impact vicarious experiences of the observers,

ultimately impacting self-efficacy levels. Moreover, through feedback, following the observation, verbal persuasion may take place, which will also impact self-efficacy levels. Peer observations lend itself to having so many opportunities which could influence efficacy levels. Studying this relationship may inform the use of peer observations and also affect the overall teaching and learning environment in schools.

In a case study pertaining to student teachers, Akkuzu (2014) found that the studied student teachers reported observation feedback having positive effects on their self-efficacy levels. Specifically, looking at the relationship between verbal persuasion and teaching performance revealed that feedback based on verbal persuasion affected student teachers' performance in the realm of motivation and critical thinking (Akkuzu, 2014). One student teacher shared that the feedback received after poor teaching experiences assisted him with his efficacy levels when the observer used verbal persuasion to decrease his worries (Akkuzu, 2014). Similarly, many researchers have found student teachers to overcome difficulties through mastery experiences, and individual and cooperative feedback, ultimately influencing higher self-efficacy beliefs (Bandura, 1997; Tschannen-Moran & Woolfolk-Hoy, 2007). Additionally, teachers who receive verbal persuasion demonstrated enhanced motivation and performance when compared to teachers who did not receive feedback consisting of verbal persuasion (Akkuzu, 2014). Moreover, feedback also influences teacher self-efficacy when the feedback incorporates constructive observations, which influences the psychological and emotional states of the teacher (Frase, 2001; Akkuzu, 2014; Birringer-Haig, 2014). Additionally, teachers should receive extensive feedback, influencing their social persuasion, as a means to overcome any fears they have in the classroom. This social persuasion can build the efficacy levels of teachers and increase their willingness to try new and innovative practices (Curry, 2016).

In an experimental study involving 48 English teachers of English language institutes in Iran, it was found that peer observations improve the self-efficacy levels of the teaching performing the observation and the instructional skill of the teacher being observed (Mousavi, 2014). I would conceptualize that since there is a relationship between instructional ability, as evidenced with mastery experiences, that the efficacy levels of the observed teacher could in fact improve if given more time to conduct successful lessons. Additionally, Mousavi (2014) identified the importance of having a post observation conference, which was a part of the experimental group but not the control group, as he inferred that to be one of the impacts of increased self-efficacy levels.

A study conducted at a large, comprehensive, multi-campus Australian university found that new university teaching staff who participated in peer observations valued being able to watch their colleagues teach. Coinciding with Bandura's (1997) findings, observing the experiences of others, strengthens self-efficacy to apply new strategies to teaching (Hendry & Oliver, 2012). Staff also reported feeling reassured or affirmed in their current level of self-efficacy. In terms of the reciprocal relationship, most staff thought that observing a colleague and receiving feedback were equally beneficial. Some staff reported that observing was more useful and some thought it was more enjoyable and inspiring. Important to note is that no staff reported that being observed and receiving feedback was more useful or enjoyable than doing the observing. Perhaps the reason for this finding is that some staff reported that when they were observed they felt judged. As Bandura indicated, emotional arousal impacts self-efficacy levels. Feeling judged or insecure can decrease efficacy among teachers.

Chapter Summary

Research on teacher self-efficacy has been steadily increasing throughout the last decade (Klassen et al., 2010), however, more research is needed to fill gaps in the body of literature and to support practice for both administrators and teachers. Specifically, research has been more commonly studied on collective teacher efficacy as opposed to teacher self-efficacy (Klassen et al., 2010). Previous research recommends investigating sources of teacher self-efficacy to provide insight (Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998) into how educational leaders can influence student outcomes, teacher retention, and teacher quality (Klassen et al., 2010). Moreover, there is also a need for additional research on how teacher experience impacts teacher self-efficacy levels, as this could be of significance to teachers and administrators to identify when it is timely to pay particular attention to the sources of teacher self-efficacy. This has not been a popular study component of past research, and when studied, some of the results indicated moderate impacts (Klassen & Chiu, 2010).

The importance of this research relates back to the overall success of K-12 public education. Not only does education teach students skills in a variety of content areas, but it also develops them into lifelong learners and leaders who will impact, not only their own lives, but their communities as a whole. To enhance this experience, schools must look to improve the educational experience for students and their teachers. To create an effective teaching and learning environment, teachers must believe they are capable of making a difference (Holzberger et al., 2013; Ross & Bruce, 2007), indicating their level of self-efficacy, and work to maintain that belief throughout their careers. Teachers with high self-efficacy work harder, are more involved in information learning activities, and are more persistent and less stressed (Bandura,

1997; Lohman, 2006; Holzberger, Philipp, & Kunter 2013; Curry, 2016). Therefore, focusing on self-efficacy levels in schools will help foster an environment composed of hard work, dedication, and positive results.

Teachers must be given the opportunity to be observed and receive quality feedback, as it has proven to positively impact teacher self-efficacy and the overall outcomes of the school (Akkuzu, 2014; Barringer-Haig, 2014; Hattie, 2009). Teachers who receive observational feedback have reported higher levels of self-efficacy and felt that their teaching practices improved (Akkuzu, 2014).

Chapter 3: Methods and Procedures

Description of the Study

It is important for teachers to have a high sense of self-efficacy, as it is one of the prime motivational forces influencing student learning, teacher instruction, and in turn, overall student success (Curry, 2015; Hattie, 2009; Klassen & Chiu, 2010). Teachers with high self-efficacy are more likely to persist when faced with challenges in the classroom, are more involved in learning new instructional strategies, and have higher assurance in their instructional decisions (Bandura, 1994). For these reasons, it is imperative to study the sources of teacher self-efficacy.

Bandura (1994) identified four sources of self-efficacy: (1) mastery experiences; (2) verbal persuasion; (3) emotional arousal; (4) vicarious experiences. Mastery experiences refer to the positive feelings and thoughts that occur when teachers have success with their students. When teachers have a positive experience, their belief in their abilities is heightened. The inverse is true where teachers who experience an unsuccessful event will feel less assured in their abilities (Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998). Verbal persuasion, the second source of self-efficacy, comes in the form of direct encouragement, such as positive feedback from colleagues or supervisors. Receiving accurate and constructive feedback on their practice can increase the efficacy levels of teachers; whereas if they receive minimal opportunities to receive feedback, it is more likely to diminish their self-efficacy levels. Emotional arousal, refers to the physiological response to behaviors, also impact self-efficacy levels. For example, stressful situations can decrease self-efficacy levels among teachers.

Observational feedback, a highly used practice in all schools, is one of the sources of teacher self-efficacy and should be studied further. Observational feedback provided to teachers

from their administrators is one of the ways to impact student learning and teaching practices, which ultimately influences student achievement (Ovando, 2005), which demonstrates the importance of this research for K-12 educators. Due to this, peer observation feedback may have the ability to impact teaching practices, student learning, and overall school outcomes through the impact it may have on teacher self-efficacy. In other words, teacher self-efficacy is proven to impact a teachers' belief in his/her abilities, work ethic, instructional practices, and involvement in the classroom; therefore, peer observations that impact teacher self-efficacy levels could have the ability to influence school outcomes (Frase, 2001; Akkuzu, 2014; Birringer-Haig, 2014).

Furthermore, aspects of peer observations can be related to the four sources of teacher self-efficacy. Peer observations that include observation feedback or conversations before or after the observation can impact teacher self-efficacy through verbal persuasion. Mastery experiences can also be validated through peer observations and raise efficacy beliefs, which contributes to expectations of proficient performance in the future (Tschannen-Moran, et al., 1998). With mastery experiences, people associate physiological arousal further impacting self-efficacy beliefs (Tschannen-Moran, et al., 1998). Lastly, vicarious experiences, or the act of watching others teach, is a source of teacher self-efficacy directly impacted by peer observations. Observing the teaching of others, especially, credible teachers, can affect the observer's personal teaching competence (Tschannen-Moran, et al., 1998). By observing the instruction of others, teachers can believe that they can be successful given similar circumstances to what they observed (Tschannen-Moran, et al., 1998).

The purpose of this study was to further explore the relationship of teacher self-efficacy and the role a teacher may take in peer observations. Additionally, the current study examined

the relationship between teacher self-efficacy and three teacher characteristics: gender, age, and years of experience.

Research Questions

To add to the research on teacher self-efficacy as it relates to observational feedback and teaching experiences, the current study was framed by the following research questions:

1. How does teacher self-efficacy vary by teacher characteristics (gender; age, years of teaching experience)?
2. How are teacher participation in peer observations as the observer and teacher self-efficacy related?
3. How are teacher participation in peer observations as the observed and teacher self-efficacy related?
4. How does teacher self-efficacy vary by observation role (observer vs. observed) while controlling for each teacher characteristic (gender; age; years of teaching experience)?

Research Design

This study was an examination of the relationship between teacher self-efficacy, peer observations, and teacher characteristics. The design of this study was a secondary data analysis using the Teaching and Learning International Survey (TALIS). A secondary data analysis is an analysis of data that was collected by someone else for another primary purpose and follows a systematic method consisting of procedural and evaluative steps (Johnston, 2017). These steps include learning about the data being used, who the population of the study consisted of, what the objective of the study was, identifying the response categories for questions, and evaluating

whether weights need to be applied during the analysis of data (Cheng & Phillips 2014; Johnston, 2017).

There are advantages to conducting a secondary data analysis, one of which being the low cost. The TALIS dataset required no fee to obtain access to the data. Additionally, the data has undergone check and cleaning routines by the International Association for the Evaluation of Educational Achievement (IEA). The data was then sent to the partners (Statistics Canada, based in Ottawa, Canada, and the Australian Council for Educational Research), analysis teams and the Organization for Economic Co-operation and Development (OECD) for appropriate review and validity purposes.

The Teaching and Learning International Survey

The Teaching and Learning International Survey (TALIS) is a self-reported survey for teachers and principals conducted by the National Center for Education Statistics within the U.S. Department of Education. The main goal of the TALIS survey is to "generate reliable, valid and comparable population estimates based on sample data" (OECD, 2019-b, p. 21). It focuses on professional development, teaching beliefs and practices, assessment of teacher and principal work and the feedback and recognition received, and a variety of other school leadership, management, and workplace issues. TALIS had three successful cycles in 2008, 2013, and 2018 with the next cycle occurring in 2024. For this research, the focus was on the results from teachers of students in grades seven, eight, and/or nine from the 2018 cycle and specifically looked at the results from the United States.

TALIS 2018 focused on nine main themes: (1) teachers' instructional practices; (2) school leadership; (3) teachers' professional practices; (4) teacher education and initial preparation; (5) teacher feedback and development; (6) school climate; (7) job satisfaction; (8)

teacher human resource issues and stakeholder relations; (9) teacher self-efficacy. For the purpose of the current study, the focus was on teacher feedback and teacher self-efficacy.

The development of the TALIS questionnaire had three major phases: a pilot, a field trial, and the main survey. The pilot study took place in a large number of participating countries and collected feedback on the draft questionnaire from both teachers and principals. The field study collected quantitative information about the statistical and psychometric properties of the questions in all participating countries. After the pilot and field study, the draft questionnaires (teacher and principal) were revised by a Questionnaire Expert Group (QEG), creating the final version. Adjudication was also performed to determine the quality of the data. The questionnaire used for the current study was the teacher version.

The participants of the TALIS survey were part of 48 education systems, the United States being one of them. The teacher participants taught the lower secondary level, defined as grades seven, eight, and nine. TALIS utilized a canonical sampling design where the first stage random sample consisted of 200 schools per country followed by 20 teachers within each school. The current study only looked at the results of the United States. A school was considered as participating in the study if the principal returned his or her questionnaire with at least one response. Additionally, at least 50% of teachers had to participate from a school for the teachers to be considered participating. The average overall ISCED level 2 teacher participation rate was 84.3% with ranges between 52% to 99.9% (OECD, 201-a9).

Although there are advantages to using secondary data sources, it is important to keep in mind that the dataset was not established for the specific use of the current research. OECD used TALIS to help countries face diverse challenges by asking teachers and school leaders about work conditions and learning environments in their schools. However, the TALIS 2018 Starting

Strong User Guide categorizes self-efficacy into four groups: overall self-efficacy scores, classroom management self-efficacy, instruction self-efficacy, and student engagement self-efficacy. Although self-efficacy is a topic of interest and study for OECD, it was necessary to ensure that the current study's specific research questions could be answered by the selected dataset. This was verified by thoroughly examining the TALIS survey and identifying which sections, and corresponding items, were aligned with the established research questions as stated above. The TALIS questionnaire had specific sections identified as feedback and another section under "General Teaching" related to self-efficacy, which aligned to the posed research questions. Through the TALIS Technical Report (OECD, 2019-b), there was also identification of which questions were coded as self-efficacy (Table 1). Additionally, the survey also identified the years of teaching experience for each participant.

Table 1 - Teacher Self-Efficacy Domains

Classroom Management Teacher Self-Efficacy TT3G34: In your teaching, to what extent can you do the following? Response options: (1) "Not at all; (2) "To some extent; (3) "Quite a bit"; (4) "A lot"	
TT2G34D	Control disruptive behavior in the classroom
TT2G34F	Make my expectations about student behavior clear
TT2G34H	Get students to follow classroom rules
TT2G34I	Calm a student who is disruptive or noisy
Instruction Teacher Self-Efficacy TT3G34: In your teaching, to what extent can you do the following? Response options: (1) "Not at all; (2) "To some extent; (3) "Quite a bit"; (4) "A lot"	
TT2G34C	Craft good questions for students
TT2G34J	Use a variety of assessment strategies
TT2G34K	Provide an alternative explanation, for example when students are confused
TT2G34L	Vary instructional strategies in my classroom
Student Engagement Teacher Self-Efficacy TT3G34: In your teaching, to what extent can you do the following? Response options: (1) "Not at all; (2) "To some extent; (3) "Quite a bit"; (4) "A lot"	
TT2G34A	Get students to believe they can do well in school work
TT2G34B	Help students value learning
TT2G34E	Motivate students who show low interest in school work
TT2G34G	Help students think critically

Validity

Validity refers to how accurately an instrument measures what it is intended to measure (Oluwatayo, 2012). Additionally, validity relates to the degree to which theory and evidence support the suggested interpretation of test scores for the intended purpose (Oluwatayo, 2012). The TALIS 2018 Technical Report stated, "In accordance with a rigorous review of relevant research, the survey should yield information that is as valid, reliable and comparable as possible across participating countries/economies" (OECD, 2019-b). The TALIS Consortium predicted three types of analyses for the 2018 data: (1) comparisons of indicators across countries; (2) comparison of indicators over times; (3) analyses of the relationships among indicators replicated across countries/economies to establish general patterns (OECD, 2019-b). Teacher self-efficacy was studied by looking at four domains (instruction, classroom management, student engagement, and overall). This approach was supported by a large body of research supporting the validity of measures using these three domains (OECD, 2018). It is important to note that the survey was self-reported by teachers. Self-reporting is often seen as a controversial measure; however, they do provide efficient measures with suitable degrees of both reliability and validity (OECD, 2018). In terms of measuring teacher self-efficacy, several past studies utilize self-reporting due to the internal nature of self-efficacy (Tschannen-Moran et al., 1998). Tschannan-Moral et al. (1998) also concluded that a valid measure of teacher self-efficacy should include both an assessment of personal competence and an analysis of the task in terms of the resources and constraints. The questions outlined in the TALIS survey that address teacher self-efficacy (See Table 1 above), met that outlined criteria.

Furthermore, questions and items were improved by the TALIS 2018 International Consortium and the Questionnaire Expert Group as deemed appropriate and validated through

comparative experiments (OECD, 2019-b). The questionnaire also underwent a pilot study, which focused on the following dimensions: (a) applicability of concepts and validity; (b) level of complexity of questionnaire; (c) organization of topics and items; (d) applicability of items across ISCED levels and programs (academic/vocational); (e) international versus local applicability of items; (f) item wording and definition of terms; (g) appropriateness and cultural relevance; (h) mandatory national adaptations; (i) foreseen translation issues; (j) flow of questions (overall and specifically with respect to skipping instructions); (k) length of questionnaires (OECD, 2019-b).

Reliability

In quantitative research reliability refers to the possibility of replication (OECD, 2018). There are many threats to both validity and reliability. The goal of TALIS was to generate valid, internationally comparable information as it relates to teachers and teaching, while maintaining an emphasis on aspects at the system, school and teacher levels that are known or can be expected to affect student learning (OECD, 2019-b). With that said, the TALIS 2018 International Consortium and the Questionnaire Expert Group developed an iterative process where academics and researchers formulated concepts, discussed them with stakeholders, and revised and reformulated the concepts as necessary with the goal of creating a reliable and valid survey (OECD, 2019-b). Furthermore, there was a pilot study done to ensure the questionnaire met the needs of the countries participating. For example, one of the "probing questions" asked during the pilot study was, "Are the concepts used in the items relevant for your country, region and school?" (OECD, 2019-b). Additionally, the pilot study focused on the domains outlined above in the previous section.

Data Analysis Procedure

Weighting

Weighting is used to correct imbalances in a sampling profile after data collection. The international TALIS consortium coordinated survey weighting for all education systems participating in TALIS 2018 (Teaching and learning international survey (talis) - weighting, n.d.; OECD, 2019-b). To produce the teacher weighting system, school weighting was conducted first. The reciprocal of the school's probability of selection defined the school base weight (Teaching and learning international survey (talis) - weighting, n.d.). Within each stratum, the school base weights were then adjusted for nonresponding schools that were not able to be replaced by other schools to yield the final school weights (Teaching and learning international survey (talis) - weighting, n.d.). TALIS required a response rate of 75% of sampled schools (after specified replacement), with each school needing a minimum response rate of 50%, to ensure that samples were not biased by non-response (OECD, 2019-b). If the number of teacher participants from a school fell below the 50% threshold, it was flagged as a non-participating school and then recomputed the school non-response adjustment. The final estimation weights and replication weights were also recomputed (OECD, 2019-b).

Teacher weighting included not only the teacher base weight but the school base weight and four additional adjustment factors: school nonresponse, teacher nonresponse, incidental inclusions, and multiplicity. Teacher base weight was defined as the reciprocal of the within school probability of selection for each selected teacher (Teaching and learning international survey (talis) - weighting, n.d.). There was a teacher nonresponse adjustment that allocated the weight of the nonresponding teachers to responding teachers within each school. The design weight for teacher data had two components. One component was to allow expansion from the

individual teacher to the school, and the second to allow expansion from the school to the country or economy (OECD, 2019-b). The variable name for teacher weights in the data file from OECD was TCHWGT. The final teacher weight (TCHWGT) was used in SPSS to appropriately weight all data prior to running any tests.

Variable Coding

To be analysis of the TALIS questionnaire data, the coding conventions had to be understood. All variable names began with the four digits, “TT3G”, which indicated the questions were from the teacher questionnaire (OECD, 2019). The fifth and sixth digit indicated the question number. For example, TT3G02 related to question two on the teacher questionnaire: “How old are you?” The seventh digit, if needed, indicated the level of the question (OECD, 2019). This was only used if the question was broken into different parts. For example, TTG06A refers to item A of question 6. Lastly, if needed, the question was further divided to indicate a matrix question (OECD, 2019). For example, question 29 of the teacher questionnaire was a matrix question. To indicate this question, the code used was “TT3G29C4.” This refers to question 29, item C in the teacher questionnaire. The last digit of “4” indicated the fourth category “I have never received this feedback in this school.”

Data Cleaning

Once the variables were operationalized based on the theoretical alignment of items to the specific dimensions of self-efficacy, it was necessary to conduct data cleaning. In consultation with the concerned country/economy, the questionnaire experts, and the OECD, the raw information collected from the questionnaires underwent extensive processing, inspections, cleaning and editing (OECD, 2019). Through this process, out of value ranges, questions

determining flow of the questionnaire, and inconsistent or implausible combinations of responses were routinely inspected and cleaned. Although OECD indicated an extensive cleaning process, I still went through the data in search of outliers or errors in reporting.

In the TALIS 2018 data set provided by OECD, the following "not administered questions" code was used: "8", "98", "998", etc. (depending on the field length of the variable) (OECD, 2019). These codes were used for the following cases, as outlined by OECD (2019):

- When a questionnaire was returned empty, was not returned or was lost. All variables referring to that questionnaire and any derived variables were coded as "not administered".
- When, for socio-cultural reasons, a participating country/economy might have chosen to not administer a certain question in its national questionnaire. The variables corresponding to the question that was removed were coded as "not administered". See Chapter 4 of the technical reports (OECD, 2019[1]; OECD, 2019[2]) and Annexes G and H in this guide for details on national adaptations.
- When the variable was suppressed as part of the confidentiality measures applied in the public-use international database.
- When according to their origin, the data of respondents who received combined questionnaires were distributed to the leader and staff datasets. For these respondents, all other questions that were not part of the combined questionnaires were coded as "Not administered".
- When in staff records that were created for a leader who completed the leader questionnaire but had staff roles in addition to their role as leader (see 1.2.2), the code

"not administered" was used for any variable belonging to questions that do not have a match in the leader questionnaire.

In a similar fashion, there were questions that were not administered for the reasons as outlined below by OECD (2019). The codes used to identify not administered questions "8", "98", "998", etc. as it depends on the length of the variable.

- When a questionnaire was returned empty, was not returned or was lost. All variables referring to that questionnaire and any derived variables were coded as "not administered".
- When, for socio-cultural reasons, a participating country/economy might have chosen to not administer a certain question in its national questionnaire. The variables corresponding to the question that was removed were coded as "not administered". See Chapter 4 of the technical reports (OECD, 2019[1]; OECD, 2019[2]) and Annexes G and H in this guide for details on national adaptations.
- When the variable was suppressed as part of the confidentiality measures applied in the public-use international database.
- When according to their origin, the data of respondents who received combined questionnaires were distributed to the leader and staff datasets. For these respondents, all other questions that were not part of the combined questionnaires were coded as "Not administered".
- When in staff records that were created for a leader who completed the leader questionnaire but had staff roles in addition to their role as leader (see 1.2.2), the code "not administered" was used for any variable belonging to questions that do not have a match in the leader questionnaire.

Additionally, responses to questions were coded as “omitted or invalid” for the reasons outlined below by OECD (2019). The codes used to indicate “omitted or invalid” questions were “9”, “99”, “999”, etc. as it depends on the field length of the variable.

- When the question was administered but no response was provided.
- When the respondent selected more than the expected number of checkboxes or gave a response that was not interpretable.
- When a particular question (or a whole page) was misprinted or left out of a questionnaire or for other reasons was not available to the respondent.
- When a particular response or a set of responses was found to be implausible and a forced cleaning action was defined for these variables, e.g. in the case of numeric response outside of a plausible range for the number of students enrolled in the target class (variable TT3G38) or for the amount of the leader’s working hours per week (variable SL1G06).

Furthermore, there were also questions deemed as “not reached”. Whereas, questions coded as “omitted” referred to questions that participants most likely read and either chose not to answer or accidently skipped; questions coded as “not reached” were those that participants omitted towards the end of the questionnaire due to lack of time (OECD, 2019). For consistency purposes, before assigning a code of “not reached”, the last valid answer was identified. The following question was then coded as “omitted”, and the following questions were coded as “not reached”.

Lastly, “logistically not applicable” questions were those that “When the previous filter question was answered in a way that made a response to dependent questions logically impossible, and the dependent questions were validly skipped” (OECD, 2019). This code was

only assigned by IEA Hamburg after data collection. These were coded in the SPSS file as “6”, “96”, “996”, etc.

For the purpose of this study, I ensured that all questions related to gender, years of experience, and feedback were not omitted by the majority of the population so that I would have enough data to run analyses. Since this is the premise of the current study, this was important in determining if the TALIS Questionnaire was an adequate tool for this study.

SPSS and Data Analysis

Dependent Variables

Through this study, I looked at three continuous dependent variables: classroom management self-efficacy (T3SECLS), instruction self-efficacy (T3SEINS), and student engagement self-efficacy (T3SEENG). There was also a composite teacher self-efficacy score (T3SELF) that was used in the data analysis. A domain specific approach allowed research to focus on distinct tasks and gain specific knowledge related to self-efficacy (Bandura, 1997; Klassen & Chiu, 2010). The questions used in the TALIS survey focus on specific tasks aligned with a domain approach.

Independent Variable 1: Peer Observation Participation as the Observed

The first independent variable analyzed was teacher participation in peer observations as the observed teacher. There were two subcategories to this independent variable: yes and no. The original survey question from the TALIS questionnaire has participants check a box if their classroom teaching was observed by a colleague within the school. This colleague was not someone from the school management team or the administration. The original coding of these responses was “1” representing a participant who checked the box (yes) and “2” representing a participant who did not check the box (no). This data was recoded as “0” indicating a participant

was not observed by a peer, and "1" indicating that a participant was observed by a peer. Since the categories of "yes" and "no" represent a nominal variable, I created a dummy variable in order to run future analyses, such as regression. The dummy variable in this incident was "0" which represented the answer "no". The original data provided by OECD also included questions that were not reached, coded as "7"; questions not administered, coded as "8"; and questions omitted or invalid, coded as "9". Responses with any of these three codes, were thrown out and not a part of the recoding process.

Independent Variable 2: Peer Observation Participation as the Observer

The second independent variable was teacher participation in peer observations as the observer. There were three subcategories to this variable: never, once a year, and more than once a year. In the survey, the original question asked participants to identify how often they observed teachers' classes and provided feedback. The answer options were: never, once a year or less, two to four times a year, five to 10 times a year, one to three times a month, and once a week or more. These categories were recoded to "0" indicating that the participant did not observe other teachers' classes and provide feedback, and "1" indicating that the participant did observe other teachers once a year, and "2" indicating that a participant observed a teacher more than once a year. The original data provided by OECD also included questions that were not reached, coded as "7"; questions not administered, coded as "8"; and questions omitted or invalid, coded as "9". Responses with any of these three codes, will be excluded from the recoding process.

Covariate 1: Year of teaching experience

The third independent variable, which was also a controlled variable, was years of teaching experience. The TALIS survey question asked participants to provide the number of years they have taught rounded to the nearest whole number. These continuous variables were

converted to seven categorical answers: 0-5 years of experience, 6-10 years of experience, 11-15 years of experience, 16-20 years of experience, 21-25 years of experience, 26-30 years of experience, and more than 30 years of experience. After recoding, the sample size of each category was still sufficient.

Prior to recoding the independent variable, "years of experience", an outlier analysis was conducted to identify any errors in data collection and determine which outliers were thrown out of the data and which ones would remain within the data set. Due to the extensive cleaning process conducted by OECD, all outliers remained in the dataset, as they were within the possible range of outputs.

Covariate 2: Age

For this study, I controlled for the age of the participants to see if there were any relationships between age and teacher self-efficacy. The TALIS questionnaire allows participants to provide a numerical answer indicating their age. However, in the SPSS data file, age was categorized into six groups: (1) participants under the age of 25; (2) ages 25 through 29; (3) ages 30 through 39; (4) ages 40 through 49; (5) ages 50 through 59; (6) ages 60 and above.

Covariate 3: Gender

Gender is another control variable in this study. The questionnaire asked, "Are you male or female?" and has the participant chose only one response. The original data coded females as "1" and males as "2". I recoded this so male was "0" and female was "1." Although SPSS accepts the codes "1" and "2", for consistency purposes and personal preference, I recoded as stated.

Descriptive Statistics

Descriptive statistics were examined for all variables to ensure that the assumptions underlying the statistical analyses conducted in this study were met (normality, X, Y, Z). Specifically, I used measures of central tendency by finding the mean, standard deviation, minimum, and maximum of the data to ensure it met the normal distribution assumption of most statistical tests. I also measured the spread of the data through various statistical tests such as range, quartiles, absolute deviation, variance, and standard deviation. These descriptive statistics were presented for each variable in this study.

Bivariate Analyses

Bivariate analyses were used to study the relationship between teacher self-efficacy and the independent variables outlined above (gender, age, years of experience, observational feedback as the observer, and observational feedback as the observed). I first conducted bivariate analyses to identify the relationship between the teacher self-efficacy variables and each of the independent variables. I conducted these tests to examine the relationships among each predictor and control variable and all four of the teacher self-efficacy variables (classroom management, instruction, engagement, overall).

How does teacher self-efficacy vary by teacher characteristics (gender; age; years of teaching experience)?

First, to look at the relationship between each domain of teacher self-efficacy and gender, I used an independent samples t-test. The independent samples t-test was used to determine if a difference existed between the means of two independent groups (male and females) on the continuous variable of self-efficacy. This test identified whether the difference between these

two groups was statistically significant (Laerd, 2013). This was useful to determine how males and females compared to each other in their self-efficacy levels.

There were six assumptions considered prior to running this test. The first three assumptions were related to the design of the study. First, there had to be a continuous dependent variable. This assumption was met with the continuous variable of teacher self-efficacy. Specifically, this test was run four separate times; once for each of the self-efficacy categories: classroom management, instruction, student engagement, and overall. The second assumption related to the design is that the independent variable is categorical with two groups. Again, this assumption was met because the independent variable was gender broken down into two groups: males and females. The last assumption related to the design was that there must be independence of observations. This was true since a participant only chose either male or female as their gender and cannot be found in both groups.

The next three assumptions were related to the nature of the data and were tested using SPSS statistics. If any of the following assumptions were violated, I had to make a decision to either continue forward, make corrections to the data so it no longer violates the assumptions, or use a different statistical test. The first assumption related to the nature of the data was that there should be no significant outliers in the two groups of the independent variable in terms of the dependent variable. Therefore, I investigated if the composite score of teacher self-efficacy, and the self-efficacy score for each of the three groups (instruction, classroom management, student engagement), has any outliers in both gender groups. To determine if there were outliers in the data, SPSS was used to create boxplots.

The second assumption related to the nature of the data was the dependent variable should be approximately normally distributed for each group of the independent variable, also

referred to as the assumption of normality. It is important to note that the independent sample t-test is robust to violations of normality, meaning that some violations of this particular assumption can be violated while still having valid results (Laerd, 2013). To test for normality, I used the Shapiro-Wilk test for normality.

The last assumption was to have homogeneity of variances, meaning that the variance is equal in each group of the independent variable (males and females). The assumption of homogeneity of variance stated that the population variance for each group of the independent variable, male and female, must be the same size. Typically, if the sizes are similar, this assumption is not too worrisome (laerd, 2013). To determine the homogeneity of variance, I used Levene's test of equality of variance. SPSS also provided an independent samples t-test that was calculated normally and another to be used when the assumption is violated (laerd, 2013).

Once all assumptions were examined, the independent sample t-test was run using SPSS statistics.

I then used a one-way ANOVA to study the relationship between the dependent variable of teacher self-efficacy and two independent variables: years of teaching experience, and age. Similar to the independent samples t-test, the ANOVA was run four times for each independent variable. Once for the composite score of teacher self-efficacy and once for each subcategory of teacher self-efficacy (instruction, classroom management, and engagement). The one-way ANOVA was used to determine whether there were any statistically significant differences between the means of two or more independent groups. To run this test, I recoded the years of teaching experience from continuous to categorical (0-5, 6-10, 11-15, 16-20, 21-25, 26-30, >30). Since the independent variable (years of teaching experience) had more than two levels, it was beneficial to conduct a post hoc test to determine which years of experience groups (0-5, 6-10,

11-15, 16-20, 21-25, 26-30, >30) differ from each other. The same was done for age as the independent variable, which had six groups: less than 25 years; 25 – 29, 30 – 39, 40 – 49, 50 – 59, more than 60.

All assumptions were analyzed in order to run an ANOVA. The first three assumptions related to the study design, while the second three related to the fit of the data. The first three assumptions were: (1) the dependent variable of teacher self-efficacy was measured at the continuous level; (2) the independent variable of experience level of teachers was categorical with at least two groups; (3) there was independence of observations. The second half of the assumptions related to how the data fit the one-way ANOVA model. The first of which stated that there were no significant outliers in the groups of the independent variable in terms of the dependent variable. The next assumption, approximate normal distribution of the dependent variable for each group of the independent variable, was tested using the Shapiro-Wilk test for normality. Lastly, the sixth assumption of having homogeneity of variance was tested using Levene's test of equality of variance.

How is teacher participation in peer observations as the observer and teacher self-efficacy related?

One-way ANOVA was used to study the relationship between the composite of teacher self-efficacy, and each of the subcategories, with peer observation feedback as the observer. The one-way ANOVA determined if there was a significant difference between the means of participants who experienced peer observation as an observer once a year, more than once a year, or never. There were four one-way ANOVA tests run; one for the composite score of teacher self-efficacy, and then each of the subcategories (instruction, classroom management, and

student engagement). As previously stated, there were six assumptions to consider when running a one-way ANOVA and each assumption was tested to see if it was met.

How is teacher participation in peer observations as the observed and teacher self-efficacy related?

An independent sample t-tests was also used to determine if there was a significant difference between teacher self-efficacy (composite, instruction, classroom management, and engagement) and participants' experience with peer observations as the observed teacher. The assumptions were tested as outlined above.

Multivariate Analyses

How does teacher self-efficacy vary by observation role (observer vs. observed) while controlling for each teacher characteristic (gender; age; years of teaching experience)?

Multivariate analysis is the analysis of more than two variables. Specifically, I used an Ordinary Least Squares (OLS) regression where the coefficients of the regression equation represented the relationship between each independent variable (gender, age, years of teaching experience, participation in peer observations as the observer, and participation in peer observations as the observed) and the dependent variable (teacher self-efficacy). OLS regression was used to identify which variables were statistically significant and what role each one played by controlling for the other independent variables. The OLS regression was conducted four times; once for each category of teacher self-efficacy (instruction, classroom management, student engagement, and overall). Prior to running the regression model, dummy variables were created for years of teaching experience and age. Dummy variables create a control group, identified as 0, and then used "1" to indicate the data that falls within that category. For example,

when looking at the independent variable “years of experience”, one of the groups is used to identify participants who had zero to five years of experience. When using dummy variables, a “0” is used to identify all participants who do not fall into this group and a “1” to identify participants who do fall into this group. This pattern is followed for all groups of independent variables. The OLS used all of the new dummy variables.

Chapter 4: Findings

Introduction

The purpose of this study was to analyze the relationship between four types of teacher self-efficacy, teacher characteristics, and a teacher's role in peer observations. It is important for teachers to have a high sense of self-efficacy, as it is one of the prime motivational forces influencing teacher quality, and in turn, overall success (Curry, 2015; Hattie, 2009; Klassen & Chiu, 2010). One way teachers might improve self-efficacy is through a peer observation process, either as the observer or observed. Therefore, the intent of this study was to inform educators of the impacts that peer observations have on teacher self-efficacy, while also identifying the influence that specific teacher characteristics have on self-efficacy levels.

The first analyses examined the relationship between four types of teacher self-efficacy (classroom management, instruction, student engagement, and overall) and three teacher characteristics: gender, age, and years of teaching experience. The next analyses examined the relationship between the same four types of teacher self-efficacy and a teacher's role in peer observations. The final analyses examined the relationship between the four types of teacher self-efficacy and a teacher's role in peer observations while controlling for the various characteristics of teachers.

Throughout this study, outliers, normality, and homogeneity of variances were all tested. Consistently, outliers were identified but kept as part of the dataset due to falling within the output range (see Appendix B, Figures B1-B19). The assumption of dependent variables being approximately normally distributed was violated as assessed by Shapiro-Wilk's test for equality of variances ($p < .05$). Lastly, the assumption of homogeneity of variances was violated as

assessed by Levene's test for equality of variances ($p < .001$). The tests that were used for this study are the independent samples t-test, one-way ANOVA, and ordinary least squares.

Descriptive statistics were run on each of the independent variables, as shown below. Female teachers represent a larger sample size than male teachers (Table 2), which is consistent with more females being in the teaching profession than men. Additionally, there are more teachers between the ages of 30 and 59 than there are under the age of 25 or above the age of 60 (Table 3). However, more teachers had five years of experience or less than any other range of experience level (Table 4). In terms of a teacher's role in peer observations, more teachers were not observed than teachers who were observed (Table 5). In addition, more teachers had the role of observer than those that never had the role of observer in peer observations (Table 6).

Table 2 – Descriptive Statistics - Gender

	N	%
Female	1717	67.1
Male	837	32.7
Missing	6	0.2

Table 3 – Descriptive Statistics - Age

	N	%
Under 25	88	3.4
25 – 29	281	11.0
30 – 39	699	27.3
40 – 49	790	30.9
50 – 59	493	19.3
60 and above	173	6.8
Missing-Not administered	36	1.4

Table 4 – Descriptive Statistics - Years of Experience

	N	%
0 – 5	590	23.0
6 – 10	449	17.5
11 – 15	469	18.3
16 – 20	431	16.8
21 – 25	272	10.6
26 – 30	172	6.7
More than 30	177	6.9

Table 5 – Descriptive Statistics - Observed

	N	%
Observed	739	28.8
Not Observed	1694	66.2
Missing	127	5.0

Table 6 – Descriptive Statistics - Observer

	N	%
Never	1022	39.9
Once a year	666	26.0
More than once a year	735	28.7
Missing	137	5.4

Lastly, throughout this research, statistical significance level and effect size were both analyzed and reported. The TALIS survey involved a large sample with more than 2,000 teachers who participated across the United State. Because of this, all differences and relationships are statistically significant. Therefore, it was important to also look at effect size statistics. Analyses will display some small and, at times, very small effect sizes; there were no differences or relationships that were particularly large. However, in education, where it is difficult to impact many important metrics, even very small effect sizes are worthy of researchers and educators' attention.

Research Question 1: Teacher Self-Efficacy and Teacher Characteristics

The first research question asks: *How does teacher self-efficacy vary by teacher characteristics (gender; age, years of teaching experience)?* To answer this research question, findings were broken into four parts to mirror the four types of teacher self-efficacy: classroom management, student engagement, instruction, and overall (See Chapter 2, Defining Self-Efficacy; Chapter 2, Validity; Chapter 3, Dependent Variables). For each part, there are three teacher characteristics that were analyzed: gender, age, and years of teaching experience.

Descriptive statistics were computed for the four types of self-efficacy (Table 7; see Appendix B, Figure B20 - B24). The highest mean value was for the overall teacher self-efficacy level (M = 12.678). Teacher self-efficacy in classroom management was a very close second (M = 12.638). The lowest teacher self-efficacy was is the domain of student engagement (M = 11.923). Student engagement teacher self-efficacy had the lowest mean and the highest standard deviation. This means that teachers are not as confident in their ability to engage students and their scores on this measure vary the most. Further analysis will determine the significance of these differences and also find the relationship between the dependent variable and each independent variable.

Table 7 - Summary of Descriptive Statistics for Teacher Self-Efficacy

	N	Minimum	Maximum	Mean	Standard Deviation
Classroom Management TSE	1082551	4.137	15.282	12.638	2.189
Instruction TSE	1082327	3.530	15.439	12.595	2.206
Student Engagement TSE	1082551	4.028	15.681	11.923	2.415
Overall TSE	1082327	2.681	16.309	12.678	2.204

Classroom Management TSE & Gender

An independent samples t-test was run to determine if there were differences in classroom management teacher self-efficacy between males and females. Classroom management teacher self-efficacy was higher for females (M = 12.70, SD = 2.19) than males (M = 12.51, SD = 2.18), a statistically significance difference (MD = 0.19, 95% CI [0.18, 0.20], t(754032.687) = 43.249, p < .005, d = .087. The difference can be interpreted as a very small effect. Results are found in Table 8 below.

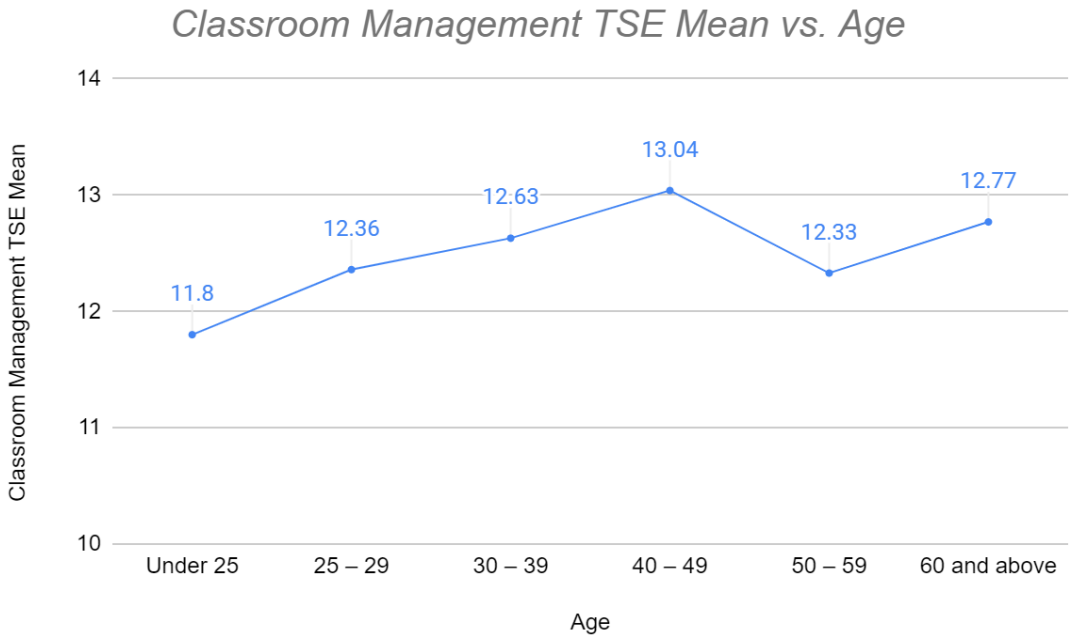
Table 8 - Independent Samples t-Test - Teacher self-efficacy in classroom management & gender

	Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the difference	
	F	p	T	Df	Sig. (2-tail)	Mean difference	Std. Error Difference	Lower	Upper
Equal variances assumed	1872.483	.000	-43.138	1080473	.000	-.1914	.00444	-.20007	-.18268
Equal variances not assumed			-43.249	754032.687	.010	-.1914	.00443	-.20005	-.18270

Classroom Management TSE & Age

As seen in Figure 1, the mean classroom management self-efficacy levels gradually increased from under the age of 25 to the age range of 40 through 49, decreased at the age range of 50 through 59, and then went up slightly from there to the age of 60 and above (see Appendix B, Table B1).

Figure 1 - Classroom Management TSE & Age



A one-way ANOVA was conducted to study the relationship between age and classroom management teacher self-efficacy. There are statistically significant differences in classroom management teacher self-efficacy across all of the age groups, $F(5, 211689.28) = 4397.10$, $p < .001$, $n^2 = .020$ (Table 9). This is a small effect size according to Cohen's (1988) guidelines.

Table 9 - One-way ANOVA - Self-efficacy in classroom management TSE & age

	Statistic	d*f1*	d*f2*	p
Welch	4397.095	5	211689.275	.000

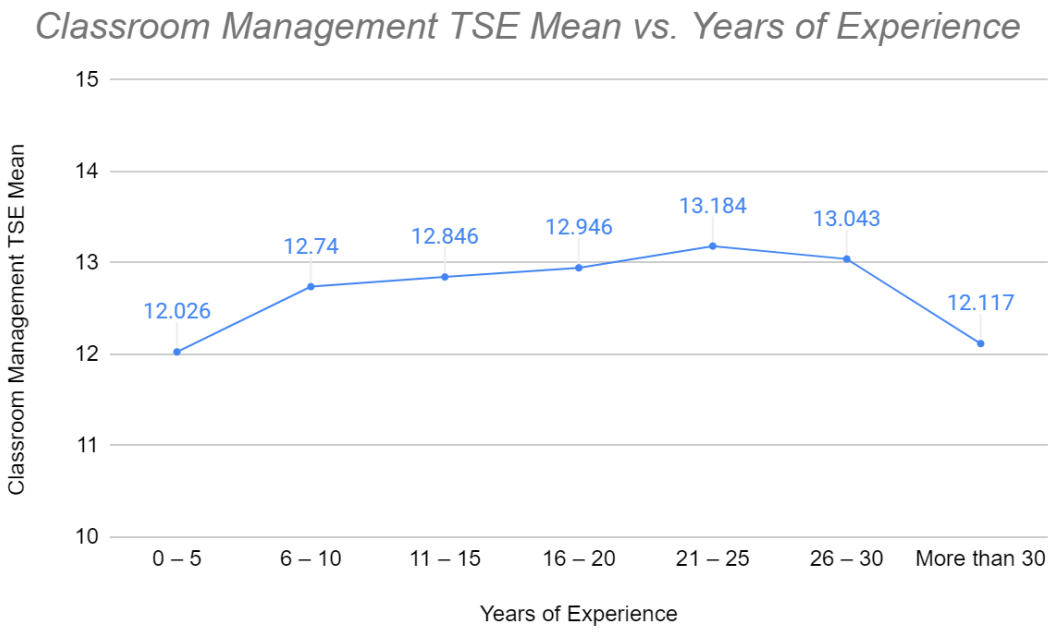
Asymptotically F distributed

A Games Howell post-hoc test was conducted to identify which age groups had a statistically significant difference in means. Each age group was different from each other age group, and all differences in means were statistically significant (see Appendix B, Table B2).

Classroom Management TSE & Years of Teaching Experience

As seen in Figure 2, the mean classroom management teacher self-efficacy levels increase from zero years of teaching experience to 21 through 25 years of teaching experience before it starts to decline the remainder of a teacher's career.

Figure 2 - Classroom Management TSE & Years of Experience



A one-way ANOVA was used to study the relationship between the years of teaching experience and classroom management teacher self-efficacy. Classroom management teacher self-efficacy was statistically different for different levels of years of teaching experience groups, $F (6, 385308.615) = 6486.542$, $p < .001$, $n^2 = .04$ (Table 10). This is a small to medium effect size according to Cohen's (1988) guidelines. The differences can be seen in Appendix B, Table B3.

Table 10 - One-way ANOVA classroom management TSE & years of experience

	Statistic	d*f1*	d*f2*	p
Welch	6486.542	6	385308.615	.000

Asymptotically F distributed

Games-Howell post hoc analysis revealed that there was a statistically significant difference in means for all combinations of groups. Early career teachers (0 - 5 years) had significantly lower classroom management teacher self-efficacy than all other teachers (see Appendix B, Table B4).

Instruction Teacher Self-Efficacy and Gender

An independent samples t-test was used to test for difference of means in instruction self-efficacy by gender. Table 11 displays the initial findings of female teachers having higher teacher self-efficacy in instruction than males.

Table 11 - Descriptive Statistics - Instructional TSE & Gender

	N	Mean	Std. Deviation	Std. Error
Male	798	12.307	2.255	.080
Female	1621	12.956	2.109	.052

There was a statistically significant difference in instruction teacher self-efficacy scores between males and females with females having higher efficacy levels than males MD = -.649, 95% CI[-.832, -.456], t(2417) = -6.951, $p < .001$, d = .30 (Table 12). The difference can be interpreted as a small effect size.

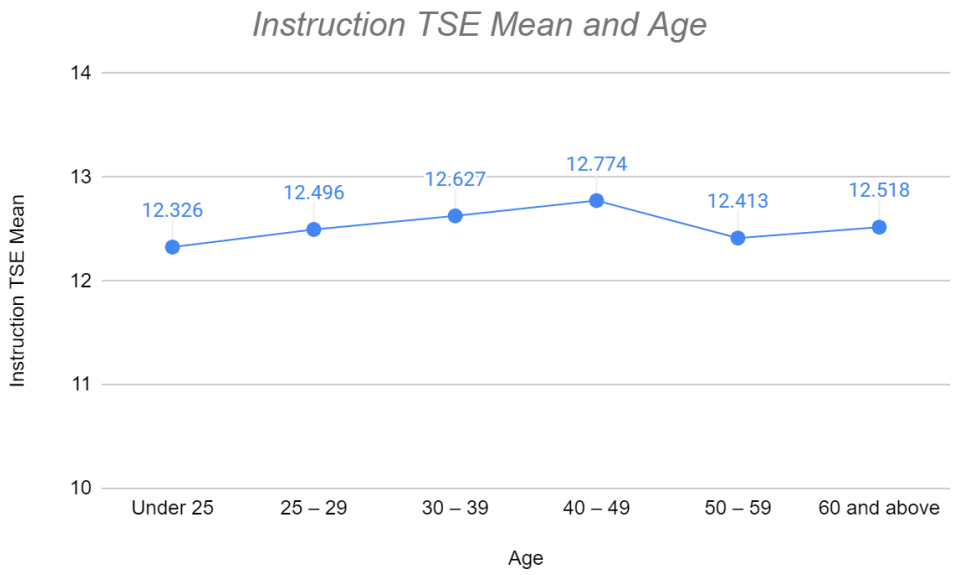
Table 12 - Independent Samples t-test - Instruction TSE & Gender

	Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the difference	
	F	p	T	Df	Sig. (2-tail)	Mean difference	Std. Error Difference	Lower	Upper
Equal variances assumed	2.351	.125	-6.951	2417	< .001	-.649	.093	-.832	-.456
Equal variances not assumed			-6.795	1495.145	< .001	-.649	.095	-.836	-.461

Instruction Teacher Self-Efficacy and Age

As seen in Figure 3, teacher self-efficacy in instruction increases with age until the age range 40 through 49 at which point it starts to decline until a very slight increase at the last part of a teacher's career (see Appendix B, Table B5). To further analyze, a one-way ANOVA was conducted to test for differences of means in instructional teacher self-efficacy by age groups.

Figure 3 - Instruction TSE & Age



There were statistically significant differences in instruction teacher self-efficacy between the different age groups, $F(5, 212532.964) = 934.361$, $p < .001$, $n^2 = .004$ (Table 13). The difference can be interpreted as a very small effect size.

Table 13 - One-way ANOVA - Instruction TSE & Age

	Statistic	d*f1*	d*f2*	p
Welch	934.361	5	212532.964	.000

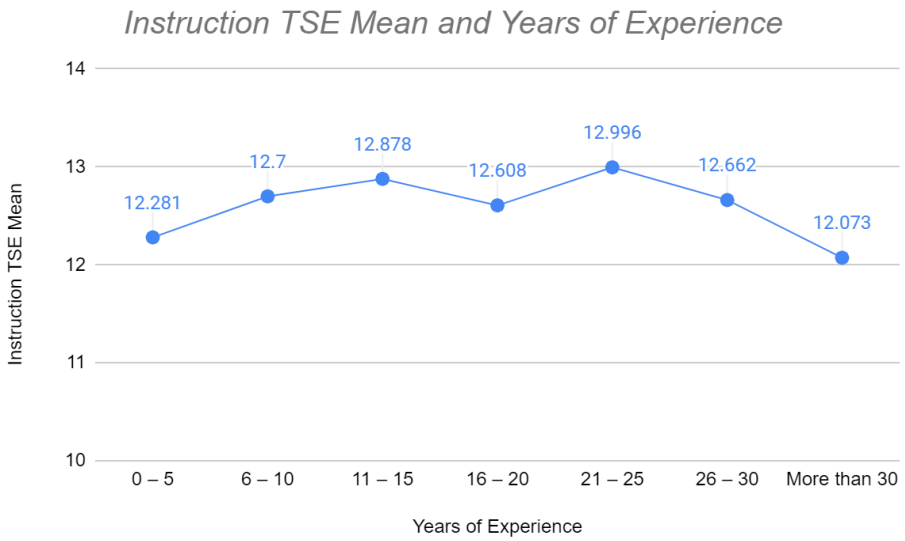
Asymptotically F distributed

A Games Howell post-hoc test was conducted to identify which age groups had a statistically significant difference in means. Each age group was different from each other age group, and all differences in means were statistically significant (see Appendix B, Table B6).

Instruction Teacher Self-Efficacy and Year of Teaching Experience

As seen in Figure 4, there was an increase in instructional teacher self-efficacy from no experience through 11 to 15 years of experience. Self-efficacy then declined for the 16 through 20 years of experience group, increasing again for the 21 through 25 years of experience group and then steadily declining (Figure 4; see Appendix B, Table B7).

Figure 4 - Instruction TSE & Years of Experience



A one-way ANOVA shows that there were statistically significant differences in instructional teacher self-efficacy across levels of experience, $F(6, 381537.621) = 2822.690$, $p < .001$, $n^2 = .02$ (Table 14). This is a small effect size according to Cohen's (1988) guidelines.

Table 14 - One-way ANOVA - Instruction TSE & Years of Experience

	Statistic	d*f1*	d*f2*	p
Welch	2822.690	6	381537.621	.000

Asymptotically F distributed

A post-hoc analysis was conducted to identify which level of years of experience had statistically different means. The post-hoc analysis displayed statistically significant differences in means across all possible combinations of years of teaching experience combinations (see Appendix B, Table B8).

Student Engagement Teacher Self-Efficacy and Gender

An independent samples t-test was used to compare means of student engagement teacher self-efficacy by gender. Student engagement teacher self-efficacy was higher for females (M = 11.952, SD = 2.473) than males (M = 11.864, SD = 2.297), a statistically significance difference M = 0.088, 95% CI [0.079, 0.098], t(798775.560) = 18.461, p < .001, d = .04 (Table 15). The difference can be interpreted as a very small effect size according to Cohen's d.

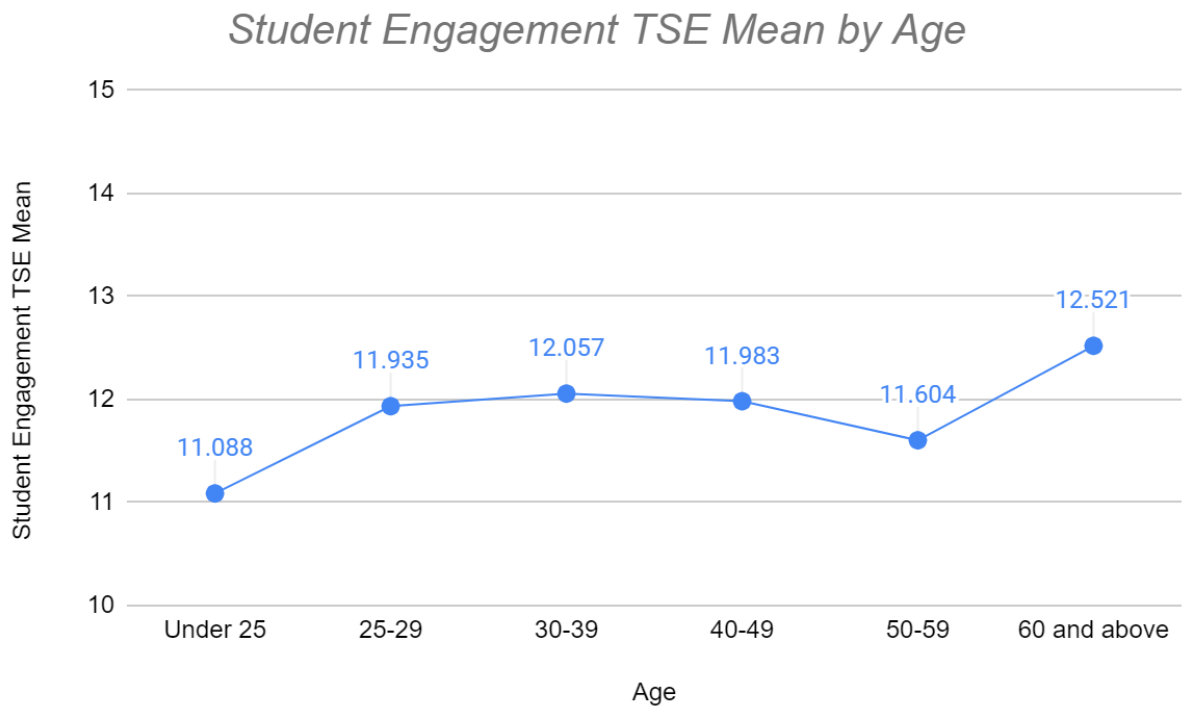
Table 15 - Independent Samples t-test - Student Engagement TSE & Gender

	Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the difference	
	F	p	T	Df	Sig. (2-tail)	Mean difference	Std. Error Difference	Lower	Upper
Equal variances assumed	4458.968	.000	-18.035	1080473	.000	-.088	.005	-.098	-.079
Equal variances not assumed			-18.461	798775.560	.000	-.088	.005	-.098	-.079

Student Engagement Teacher Self-Efficacy and Age

As depicted in Figure 5, teacher self-efficacy in student engagement increases from under the age of 25 to the age groups of 25-29; levels then stay relatively consistent until it declines for the 50-59 age group. Self-efficacy levels then increase at a steeper rate for teachers who are 60 years or older (Figure 5; Appendix B, Table B9).

Figure 5 - Student Engagement TSE & Age



An ANOVA was conducted and student engagement teacher self-efficacy was statistically significantly different for different levels of age groups, F(5, 215524.491) = 3031.764, $p < .001$, $n^2 = .013$ (Table 16).

Table 16 - One-way ANOVA - Student Engagement TSE & Age

	Statistic	*df1*	*df2*	p
Welch	3031.764	5	215524.491	.000

Asymptotically F distributed

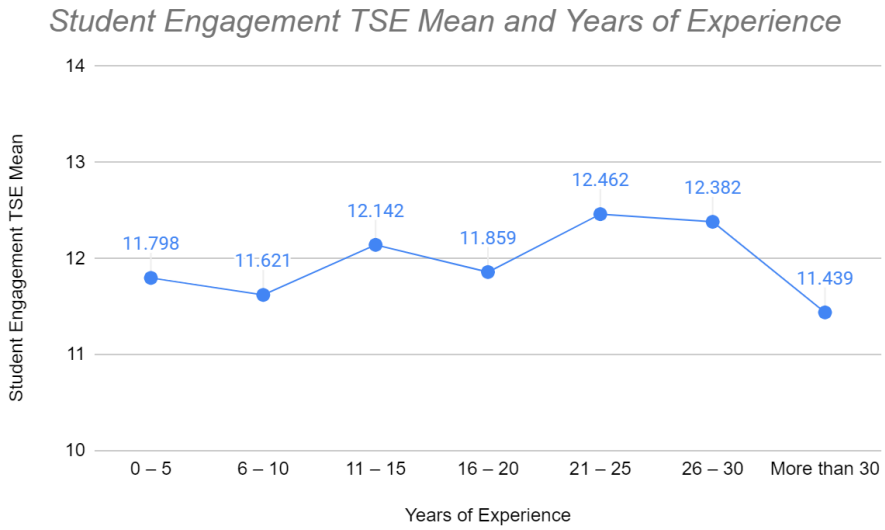
A Games-Howell post-hoc test was run to determine which age groups displayed statistically significant differences in student engagement teacher self-efficacy levels. All combinations of age groups show a statistically significant difference between age groups for

student engagement teacher self-efficacy levels, with the exception of the combination for age groups 25 through 29, and 60 and older (see Appendix B, Table B10).

Student Engagement Teacher Self-Efficacy and Years of Teaching Experience

Initial analysis of means shows a varied student engagement teacher self-efficacy level by years of experience (Figure 6). The lowest point of student engagement self-efficacy levels is when a teacher has more than 30 years of experience. The highest point of student engagement teacher self-efficacy levels is when a teacher has 21 through 25 years of experience. Additional initial findings can be seen in the appendix (see Appendix B, Table B11).

Figure 6 - Student Engagement TSE & Years of Experience



A one-way ANOVA was conducted to determine if student engagement teacher self-efficacy was different for groups with different years of teaching experience. Participants were classified into seven groups: zero to five years of experience, six to 10 years of experience, 11 to 15 years of experience, 16 to 20 years of experience, 21 to 25 years of experience, 26 to 30 years

of experience, and more than 30 years of experience. The differences in student engagement teacher self-efficacy by years of teaching experience was statistically significant, $F(6, 383463.734) = 2934.269$, $p < .001$, $n^2 = .02$ (Table 17). This is a small effect size according to Cohen's (1988) guidelines.

Table 17 - One-way ANOVA - Student Engagement TSE & Years of Experience

	Statistic	*df1*	d*f*2	p
Welch	2934.269	6	383463.734	.000

Asymptotically F distributed

A post-hoc analysis was conducted to identify the statistically significant difference of means for each group of experience level. Differences across all possible combinations were statistically significant (see Appendix B, Table B12).

Overall Teacher Self-Efficacy and Gender

Table 18 displays descriptive statistics of males and female teachers' overall self-efficacy levels. Consistent with the domains of teacher self-efficacy, female teachers have higher self-efficacy than males.

Table 18 - Descriptive Statistics - Overall TSE & Gender

	N	Mean	Std. Deviation	Std. Error
Male	369619	12.362	2.196	.004
Female	710631	12.839	2.191	.003

An independent samples t-test was run to determine if there were differences in overall teacher self-efficacy between males and females (Table19). Classroom management teacher self-efficacy was higher for females (M = 12.839, SD = 2.191) than males (M = 12.362, SD = 2.196),

a statistically significance difference MD = 0.477, 95% CI [0.468, 0.486], t(747189.673) = 107.195, p < .001, d = .22. The difference can be interpreted as a small effect size.

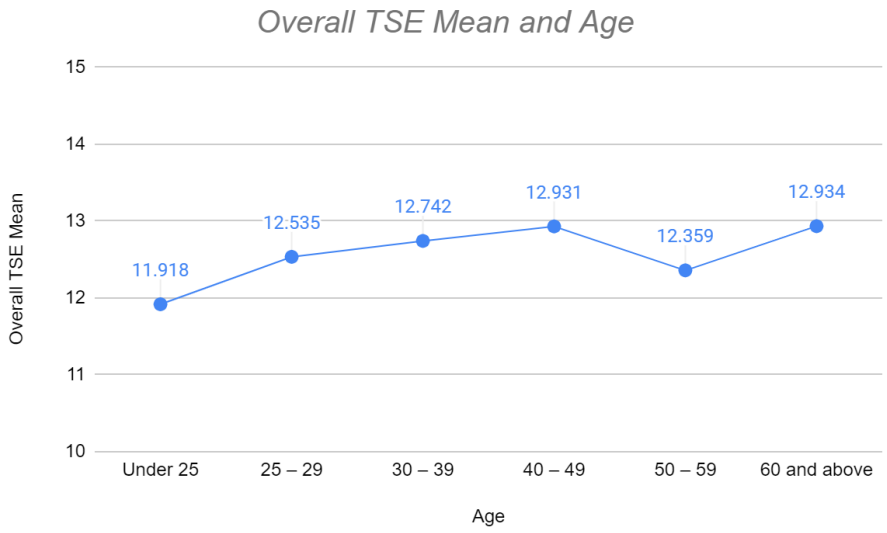
Table 19 - Independent Samples t-test - Overall TSE & Gender

	Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the difference	
	F	p	T	df	Sig. (2-tail)	Mean difference	Std. Error Difference	Lower	Upper
Equal variances assumed	684.223	<.001	-107.275	1080248	.000	-.477	.004	-.486	-468
Equal variances not assumed			-107.195	747189.673	.000	-.477	.004	-.486	-.468

Overall Teacher Self-Efficacy and Age

As seen in Figure 7, overall teacher self-efficacy increased with age until the age group of 50 to 59 where there is a slight decrease before increasing again at the age of 60 (see Appendix B, Table B13).

Figure 7 - Overall TSE & Age



A one-way ANOVA test was conducted, and there was a statistically significant difference between means of overall teacher self-efficacy for each age group, F (5, 213538.682) = 3023.262, $p < .001$, $n^2 = .014$. This is a very small effect size according to Cohen's (1988) guidelines (Table 20).

Table 20 - One-way ANOVA - Overall TSE & Age

	Statistic	*df1*	d*f*2	p
Welch	3023.262	5	213538.682	.000

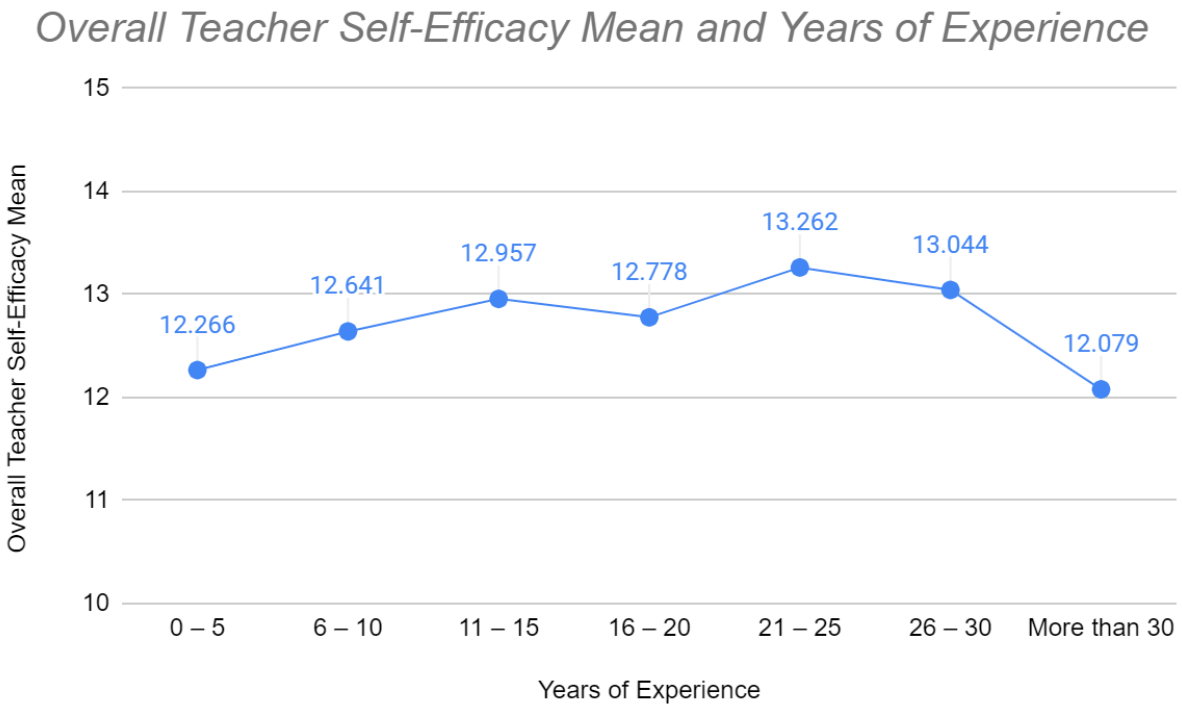
Asymptotically F distributed

To identify the statistically significant difference in means for particular age groups, a Games-Howell post-hoc test was conducted (see Appendix B, Table B14). All possible combinations of age groups have a statistically significant difference in means with the exception of the age group 40 to 49 and 60 and above.

Overall Teacher Self-Efficacy and Years of Teaching Experience

Figure 8 shows an increase in overall teacher self-efficacy as years of experience increases, with a dip in self-efficacy levels once a teacher has 16 to 20 years of experience. Self-Efficacy then increases with 21 to 25 years of experience before declining again until the end of a teacher's career (see Appendix B, Table B15).

Figure 8 - Overall TSE & Years of Teaching Experience



A one-way ANOVA showed that there was a statistically significant difference in means between each group of experience level and overall teacher self-efficacy, F (6, 383739.597) = 4956.622, $p < .001$, $n^2 = .027$. This is a small effect size according to Cohen's (1988) guidelines (Table 21).

Table 21 - One-way ANOVA - Overall TSE & Years of Experience

	Statistic	*df1*	d*f*2	p
Welch	4956.622	6	383739.597	.000

Asymptotically F distributed

Games-Howell post-hoc test was conducted to identify statistically significant differences in overall teacher self-efficacy level means for each group of years of experience. All possible

combinations of years of experience groups show a statistically significant difference in overall teacher self-efficacy means (see Appendix B, Table B16).

Table 22 displays a summary of results for each domain of teacher self-efficacy as it relates to each teacher characteristic: gender, age, and years of teaching experience. All tested relationships were statistically significant.

Table 22 - Summary of Results - TSE & Teacher Characteristics

Self-Efficacy Domain	Teacher Characteristic	Effect size	Notes/Summary
Classroom management	Gender	d = .087 (very small)	Females higher than males
	Age	n^2 = .020 (small)	Under 25: M = 11.8 50-59: M = 12.33 25-29: M = 12.36 30-39: M = 12.63 60+: M = 12.77 40-49: M = 13.04
	Years teaching	n^2 = .04 (small to medium)	0-5: M = 12.026 30+: M = 12.117 6-10: M = 12.74 11-15: M = 12.846 16-20: M = 12.946 26-30: M = 13.043 21-25: M = 13.184
Instruction	Gender	d = .30 (small)	Females higher than males
	Age	n^2 = .004 (very small)	Under 25: M = 12.236 25-29: M = 12.511 50-59: M = 12.747 40-49: M = 12.758 60+: M = 12.832 30-39: M = 12.843
	Years teaching	n^2 = .02 (small)	30+: M = 12.073 0-5: M = 12.281 16-20: M = 12.602 26-30: M = 12.662 6-10: M = 12.7 11-15: M = 12.878 21-25: M = 12.996
Student engagement	Gender	d = .04 (very small)	Females higher than males
	Age	n^2 = .013 (small)	Under 25: M = 11.088 50-59: M = 11.604 25-29: M = 11.935 40-49: M = 11.983 30-39: M = 12.057 60+: M = 12.521
	Years teaching	n^2 = .02 (very small)	30+: M = 11.439 6-10: M = 11.621 0-5: M = 11.798 16-20: M = 11.859 11-15: M = 12.142 26-30: M = 12.382 21-25: M = 12.462
Overall	Gender	d = .22 (small)	Females higher than males

Age	n^2 = .014 (very small)	Under 25: M = 11.918 50-59: M = 12.359 25-29: M = 12.535 30-39: M = 12.742 40-49: M = 12.931 60+: M = 12.934
Years teaching	n^2 = .027 (small)	30+: 12.079 0-5: M = 12.266 6-10: M = 12.641 16-20: 12.778 11-15: M = 12.957 26-30: M = 13.044 21-25: M = 13.262

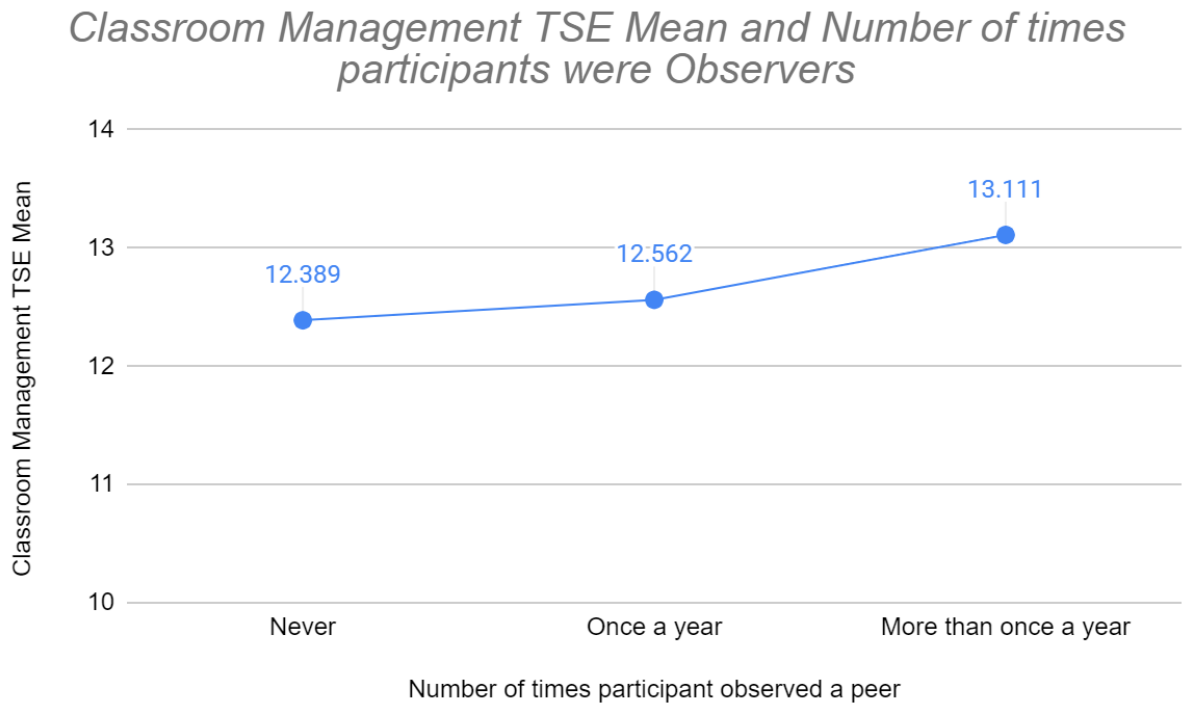
Research Question 2: The Relationship Between Teacher Self-Efficacy and Being an Observer in Peer Observations

The second research question asks: *How is teacher participation in peer observations as the observer and teacher self-efficacy related?* To answer this question a series of analyses was broken into four parts, each focusing on a different domain of teacher self-efficacy: classroom management, instruction, student engagement, and overall. The findings are outlined below.

Classroom Management Teacher Self-Efficacy and Being an Observer in Peer Observations

As seen in Figure 9, teachers who served as a peer observer more than once in a year had the highest level of classroom management teacher self-efficacy. Also, teachers who served as a peer observer once had a slightly higher classroom management teacher self-efficacy than those who never observed a peer (see Appendix B, Table B17).

Figure 9 - Classroom Management TSE & Number of Times Participants were Observers



There was a statistically significant difference in means of classroom management teacher self-efficacy and number of times a participant observed a peer, as assessed by the one-way ANOVA, F (2, 600669.706) = 11063.988, p < .001, n^2 = .02. This is a small effect size according to Cohen's (1988) guidelines (Table 23).

Table 23 - One-way ANOVA - Classroom Management TSE & Role of Observer

	Statistic	*df1*	d*f*2	p
Welch	11063.988	2	600669.706	.000

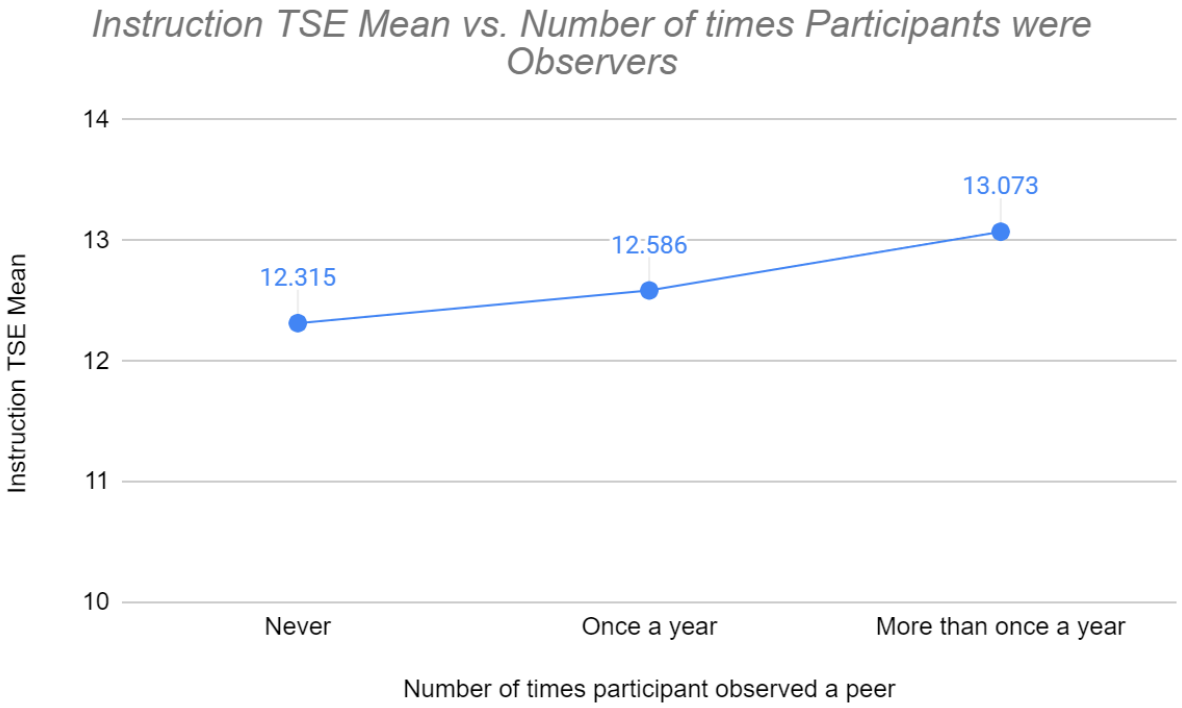
Asymptotically F distributed

The Games-Howell post-hoc analysis was conducted to identify which level of observers in peer observations had statistically significant differences in classroom management teacher self-efficacy mean. Every possible combination of groups displays a statistically significant difference in means (see Appendix B, Table B18).

Instruction Teacher Self-Efficacy and Observers in Peer Observations

As seen in Figure 10, teachers who served as a peer observer more than once in a year had the highest level of instruction teacher self-efficacy. Also, teachers who served as a peer observer once had a slightly higher instruction teacher self-efficacy than those who never observed a peer (see Appendix B, Table B19).

Figure 10 - Instruction TSE & Number of Times Participants were Observers



There is a statistically significant difference between instructional teacher self-efficacy and the number of times a teacher observed a peer as assessed by the one-way ANOVA, F (2, 598424.073) = 11393.463, $p < .001$, $n^2 = .02$. This is a small effect size according to Cohen's (1988) guidelines (Table 24).

Table 24 - One-way ANOVA - Instruction TSE and Observers

	Statistic	*df1*	d*f*2	p
Welch	11393.463	2	598424.073	.000

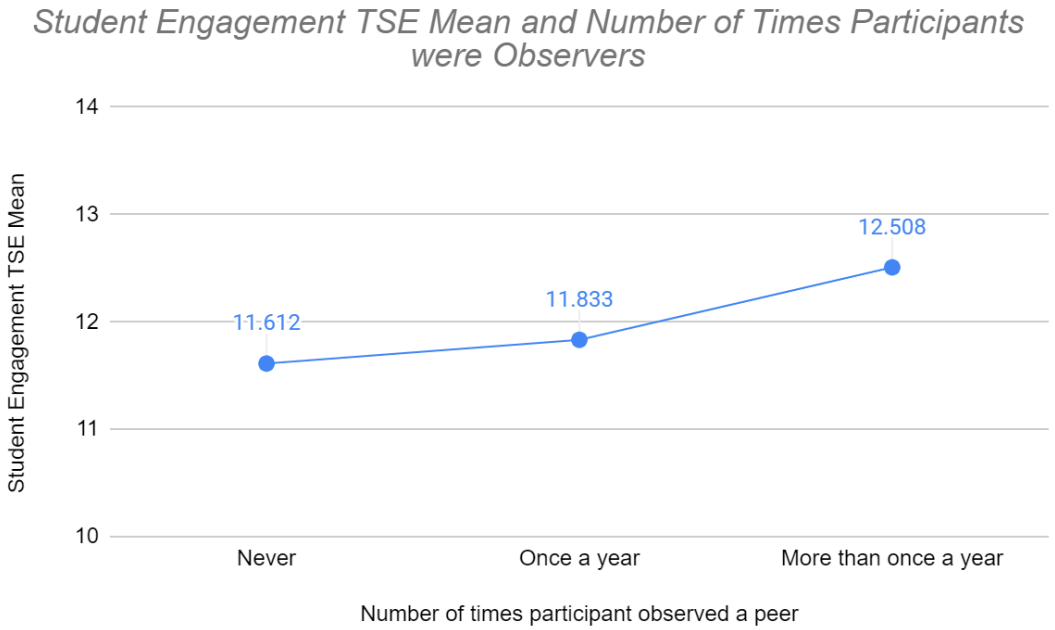
Asymptotically F distributed

A Games-Howell post-hoc test was run in order to identify which groups had the most statistically significant difference in means of instructional teacher self-efficacy (see Appendix B, Table B20). There were statistically significant differences in means across all groups with the largest difference between “never” and “more than once a year.”

Student Engagement Teacher Self-Efficacy and Observers in Peer Observations

As seen in Figure 11, teachers who served as a peer observer more than once in a year had the highest level of student engagement teacher self-efficacy. Also, teachers who served as a peer observer once had a slightly higher student engagement teacher self-efficacy than those who never observed a peer (see Appendix B, Table B21).

Figure 11 - Student Engagement TSE and Number of Times Participants were Observer



A one-way ANOVA showed a statistically significant difference between groups of observers in peer observation and student engagement teacher self-efficacy levels, F (2, 592477.600) = 12834.075, $p < .001$, $n^2 = .03$. This is a small effect size according to Cohen's (1988) guidelines (Table 25).

Table 25 - One-way ANOVA - Student Engagement TSE and Observers

	Statistic	*df1*	d*f*2	p
Welch	12834.075	2	592477.600	.000

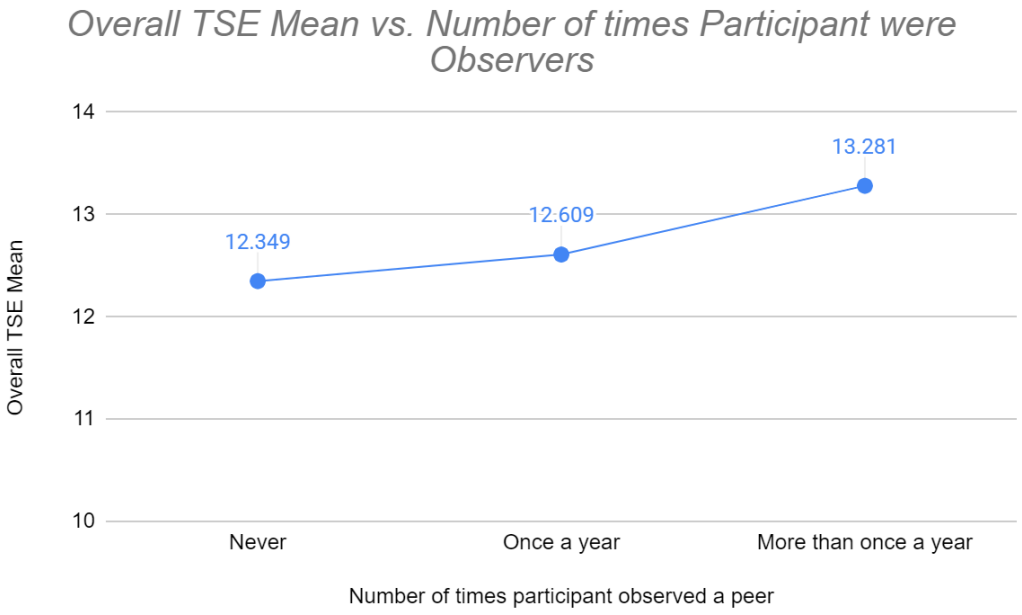
Asymptotically F distributed

A Games-Howell post-hoc test showed statistically significant differences between means for all groups of observers of peer observations (see Appendix B, Table B22).

Overall Teacher Self-Efficacy and Observers in Peer Observations

As seen in Figure 12, teachers who served as a peer observer more than once in a year had the highest level of overall teacher self-efficacy. Also, teachers who served as a peer observer once had a slightly higher overall teacher self-efficacy than those who never observed a peer. Thus, it appears that observing a peer at least once improves overall teacher self-efficacy (see Appendix B, Table B23); concluding similar findings to all domains of teacher self-efficacy.

Figure 12 - Overall TSE and Observers



A one-way ANOVA was then conducted to test for differences between groups of participation in peer observations and overall teacher self-efficacy levels, $F(2, 590052.813) = 16783.874$, $p < .001$, $n^2 = .032$. This is a small effect size according to Cohen's (1988) guidelines (Table 20).

Table 26 - One-way ANOVA - Overall TSE and Observers

	Statistic	*df1*	d*f*2	p
Welch	16783.874	2	590052.813	.000

Asymptotically F distributed

A Games-Howell post-hoc test was used to identify which groups of peer observation observers represented a statistically significant difference in means for overall teacher self-efficacy levels (see Appendix B, Table B24). The post-hoc analysis confirmed the findings outlined above found in Figure 12. All combinations of participants as observers in peer observations were statistically significant for overall teacher self-efficacy.

Table 21 summarizes the results of the relationship between all domains of teacher self-efficacy and the role of observers in peer observations. As outlined above, observing a peer at least once improves overall teacher self-efficacy and the three domains of teacher self-efficacy: classroom management, instruction, and student engagement.

Table 27 - Summary of Findings for Teacher Self-Efficacy and Observers

Domain of Teacher Self-Efficacy	Statistically significant difference?	Effect size	Notes/Summary
Classroom management	Yes	n^2 = .02 (small)	Never: M = 12.389 Once a year: M = 12.562 More than once a year: M = 13.111
Instruction	Yes	n^2 = .02 (small)	Never: M = 12.315 Once a year: M = 12.586 More than once a year: M = 13.073
Student Engagement	Yes	n^2 = .03 (small)	Never: M = 11.612 Once a year: 11.833 More than once a year: M = 12.508
Overall	Yes	n^2 = .032 (small)	Never: M = 12.349 Once a year: 12.609 More than once a year: M = 13.281

Research Question 3: The Relationship Between Teacher Self-Efficacy and Being Observed in Peer Observations

The third research question asks: *How is teacher participation in peer observations as the observed and teacher self-efficacy related?* On the TALIS teacher questionnaire, participants either mark that they have been observed by a peer or they have not, making the independent variable have two levels. The dependent variables are the four types of teacher self-efficacy: classroom management, instruction, student engagement, and overall. An independent sample t-test was run four times, once for each level of the dependent variable, to analyze the relationships between teacher self-efficacy and participants who were observed through peer observations.

Classroom Management Teacher Self-Efficacy and Peer Observation as the Observed

An independent sample t-test was used to check for statistically significant differences in means based on participation in peer observation as the observed teacher. Classroom management teacher self-efficacy was higher for teachers who did not get observed through peer observations (M = 12.721, SD = 2.172) than teachers who did get observed (M = 12.442, SD = 2.218), a statistically significant difference (MD = -.279, 95% CI [-.288, -.277], t(596638.736) = -60.206, p < .001, d = .127) (Table 28; Table 29). This difference can be interpreted as a very small effect size according to Cohen's d.

Table 28 - Descriptive Statistics - Classroom Management TSE and Observed

	N	Mean	Std. Deviation	Std. Error
Observed	322285	12.442	2.218	.004
Not Observed	757860	12.721	2.172	.002

Table 29 - Independent Samples t-Test - Classroom Management TSE and Observed

	Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the difference	
	F	p	T	d*f*	Sig. (2-tail)	Mean difference	Std. Error Difference	Lower	Upper
Equal variances assumed	135.010	<.001	-60.712	1080143	.000	-.279	.005	-.288	-.270
Equal variances not assumed			-60.206	596638.736	.00	-.279	.005	-.288	-.270

Instruction Teacher Self-Efficacy and Peer Observation as the Observed

An independent sample t-test was conducted to analyze the relationship between instructional teacher self-efficacy and participants who were observed through peer observations. Instruction teacher self-efficacy was slightly higher for teachers who did not get observed through peer observations (M = 12.603, SD = 2.184) than teachers who did get observed (M = 12.571, SD = 2.253) (Table 30), a statistically significant difference MD = -.031, 95% CI [-.040, -.021], t(591248.957) = -6.623, p < .001, d = .014 (Table 31). This difference can be interpreted as a very small effect size according to Cohen's d.

Table 30 - Descriptive Statistics - Instruction TSE and Observed

	N	Mean	Std. Deviation	Std. Error
Observed	322285	12.571	2.253	.004
Not Observed	757635	12.603	2.184	.003

Table 31 - Independent Samples t-Test - Instruction TSE and Observed

	Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the difference	
	F	p	T	d*f*	Sig. (2-tail)	Mean difference	Std. Error Difference	Lower	Upper
Equal variances assumed	474.802	<.001	-6.706	1079918	<.001	-.031	.005	-.040	-.022
Equal variances not assumed			-6.623	591248.957	<.001	-.031	.005	-.040	-.021

Student Engagement Teacher Self-Efficacy and Peer Observation as the Observed

An independent sample t-test determined that the difference in student engagement teacher self-efficacy means between teachers who were not observed and teachers who were observed was statistically significant, MD = -.243, 95% CI [-.253, -.234], t(621183.890) = -48.478, p < .001, d = .102 (Table 36). This difference can be interpreted as a very small effect size according to Cohen's d.

Table 32 - Descriptive Statistics - Student Engagement TSE and Observed

	N	Mean	Std. Deviation	Std. Error
Observed	322285	11.751	2.371	.004
Not Observed	757860	11.995	2.428	.003

Table 33 - Independent Samples t-Test - Student Engagement TSE and Observed

	Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the difference	
	F	p	T	d*f*	Sig. (2-tail)	Mean difference	Std. Error Difference	Lower	Upper
Equal variances assumed	324.126	<.001	-48.019	1080143	.000	-.243	.005	-.253	-.234
Equal variances not assumed			-48.478	621183.890	.001	-.243	.005	-.253	-.234

Overall Teacher Self-Efficacy and Peer Observation as the Observed

Descriptive statistics indicate that teachers who were observed (M = 12.525, SD = 2.222) had lower overall self-efficacy than teachers who were not observed (M = 12.742, SD = 2.192) (Table 34). An independent sample t-test determined that the difference in overall teacher self-efficacy means between teachers who were not observed and teachers who were observed was statistically significant, MD = -.217, 95% CI [-.253, -.226], t(600529.457) = -46.626, p < .001, d

= .099 (Table 35). This difference can be interpreted as a very small effect size according to Cohen's d.

Table 34 - Descriptive Statistics - Overall TSE and Observed

	N	Mean	Std. Deviation	Std. Error
Observed	322285	12.525	2.222	.004
Not Observed	757635	12.742	2.192	.003

Table 35 - Independent Samples t-Test - Overall TSE and Observed

	Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the difference	
	F	Sig.	T	d*f*	Sig. (2-tail)	Mean difference	Std. Error Difference	Lower	Upper
Equal variances assumed	1079.631	<.001	-46.884	1079918	.000	-.217	.005	-.253	-.226
Equal variances not assumed			-46.626	600529.457	.000	-.217	.005	-.253	-.226

Table 36 summarizes the results of the relationship between all domains of teacher self-efficacy and the role of observed teachers in peer observations. As outlined above, teachers who were observed at least once displayed lower levels of overall teacher self-efficacy and lower levels of teacher self-efficacy in each of the three domains: classroom management, instruction, and student engagement.

Table 36 - Summary of Findings - Teacher Self-Efficacy and Observed Teachers

Domain of Teacher Self-Efficacy	Statistically significant difference?	Effect size	Notes/Summary
Classroom management	Yes	d = .127 (very small)	Observed: M = 12.442 Not Observed: M = 12.721
Instruction	Yes	d = .014 (very small)	Observed: M = 12.571 Not Observed: M = 12.603
Student Engagement	Yes	d = .102 (very small)	Observed: M = 11.751 Not Observed: M = 11.995
Overall	Yes	d = .099 (very small)	Observed: M = 12.525 Not Observed: M = 12.742

Research Question 4: Teacher Self-Efficacy and Role in Peer Observations while Controlling for Teacher Characteristics

The fourth and final research question asks: *How does teacher self-efficacy vary by observation role (observer vs. observed) while controlling for each teacher characteristic (gender; age; years of teaching experience)?* To analyze this research question, dummy coded variables were created for all independent variables prior to conducting an ordinary least squares (OLS) regression. The OLS was conducted four times for each role in peer observation - once for each domain (classroom management, instruction, student engagement) and a final time to analyze overall self-efficacy. Additionally, years of teaching experience and age are closely correlated (significant multicollinearity was present in the models when they were included together), so the OLS was first be run with years of teaching experience and then again with age.

Classroom Management Teacher Self-Efficacy and Peer Observation Role While Controlling for Teacher Characteristics

Role of the Observed

An OLS regression was run to predict classroom management teacher self-efficacy given a teacher's role as the observed in peer observations, while controlling for gender, years of teaching experience, and age. The full model of years of teaching experience, gender and the role of the observed to predict classroom management teacher self-efficacy was statistically significant, $R^2 = .267$, $F(8, 1078059) = 49063.389$, $p < .001$; adjusted $R^2 = .267$, which suggests that the model explains 26.7% of the total variance in the dependent variable. Before controlling for gender and years of teaching experience, the model including only the ever observed variable

was statistically significant and explains 14.6% of the total variance in data (Table 37). Thus, knowing whether or not a teacher has been observed by a peer explains almost 15% of the variance in classroom management teacher self-efficacy.

Table 37 - OLS Model Summary - Classroom Management TSE and Observed

					Change statistics				
	R	R Squared	Adj. R Squared	Std. Error of the estimate	R Square Change	F Change	df1	df2	Sig. F change
1	.382[a]	.146	.146	80.257	.146	184460.927	1	1078066	.000
2	.402[b]	.162	.162	79.523	.016	19997.957	1	1078065	.000
3	.517[c]	.267	.267	74.364	.105	25796.950	6	1078059	.000

a. Predictors: (Constant), Observed
b. Predictors: (Constant), Observed, Gender
c. Predictors: (Constant), Observed, Gender, Years_Exp=4.0, Years_Exp=5.0, Years_Exp=3.0, Years_Exp=7.0, Years_Exp=2.0, Years_Exp=6.0

An OLS regression was run again to predict classroom management teacher self-efficacy given a teacher's role as the observed in peer observations, while controlling for gender and age. The full model of age, gender and the role of the observed to predict classroom management teacher self-efficacy was statistically significant, $R^2 = .269$, $F(7, 1065571) = 55957.715$, $p < .001$; adjusted $R^2 = .269$, which suggests that the model explains 26.9% of the total variance in the dependent variable. Before controlling for gender and age, the model including only the ever observed variable was statistically significant and explains 14.5% of the total variance in data (Table 38).

Table 38 - OLS Model Summary - Classroom Management TSE and Observed

					Change statistics				
	R	R Squared	Adj. R Squared	Std. Error of the estimate	R Square Change	F Change	df1	df2	Sig. F change
1	.380[a]	.145	.145	80.466	.145	180048.696	1	1065576	.000
2	.400[b]	.160	.160	79.721	.016	20001.643	1	1065575	.000
3	.518[c]	.269	.269	74.394	.108	31618.684	5	1065570	.000

a. Predictors: (Constant), Observed
b. Predictors: (Constant), Observed, Gender
c. Predictors: (Constant), Observed, Gender, TCHAGEGR=30-39, TCHAGEGR=25-29, TCHAGEGR=60 and above, TCHAGEGR=40-49, TCHAGEGR=50-59

Table 39 shows that while controlling for gender and years of experience, being observed had a significant negative effect on classroom management teacher self-efficacy, $\beta = -.346$, $t(1078067) = -407.942$, $p < .001$. For teachers who were observed by a peer, classroom management teacher self-efficacy was lower, on average, by .346 units. Additionally, the correlation coefficients for gender and years of experience confirm the results of the bivariate analyses: female teachers have higher classroom management teacher self-efficacy, and classroom management teacher self-efficacy increases with years of experience until it decreases for the very most experienced teachers.

Table 39 - OLS Regression Coefficients - Classroom Management TSE and Observed

Model		B	SE	β	t	p
1	(Constant)	12.745	.002		5356.673	.000
	Observed	-1.781	.004	-.382	-429.489	.000
2	(Constant)	13.131	.004		3640.557	.000
	Observed	-1.766	.004	-.379	-429.649	.000
	Gender	-.582	.004	-.125	-141.414	.000
3	(Constant)	12.898	.005		2768.830	.000
	Observed	-1.613	.004	-.346	-407.942	.000
	Gender	-.735	.004	-.158	-179.222	.000
	Years_Exp=2.0	.612	.005	.106	115.488	.000
	Years_Exp=3.0	.891	.006	.123	138.082	.000
	Years_Exp=4.0	1.002	.007	.124	140.772	.000
	Years_Exp=5.0	1.640	.007	.193	219.544	.000
	Years_Exp=6.0	.487	.007	.061	65.778	.000
	Years_Exp=7.0	-1.060	.006	-.168	-181.815	.000

a. Dependent Variable: Self-efficacy in classroom management / Metric (All)
b. Weighted Least Squares Regression – Weighted by Teacher Final Weight

Table 40 shows that while controlling for gender and age, being observed had a negative effect on classroom management teacher self-efficacy, $\beta = -.310$, $t(1065578) = -366.281$, $p < .001$. For teachers who were observed by a peer, classroom management teacher self-efficacy was lower, on average, by 1.613 units.

Table 40 - OLS Regression Coefficients - Classroom Management TSE and Observed

Model		B	SE	β	t	p
1	(Constant)	12.738	.002		5321.735	.000
	Observed	-1.768	.004	-.380	-424.321	.000
2	(Constant)	13.127	.004		3617.755	.000
	Observed	-1.753	.004	-.377	-424.498	.000
	Gender	-.585	.004	-.126	-141.427	.000
3	(Constant)	13.139	.017		783.742	.000
	Observed	-1.442	.004	-.310	-366.281	.000
	Gender	-.632	.004	-.136	-160.459	.000
	TCHAGEGR=25-29	.409	.019	.036	21.605	.000
	TCHAGEGR=30-39	-.125	.017	-.026	-7.416	.000
	TCHAGEGR=40-49	1.237	.017	.224	72.886	.000
	TCHAGEGR=50-59	-.758	.017	-.171	-45.351	.000
	TCHAGEGR=60+	.176	.018	.019	9.648	.000

a. Dependent Variable: Self-efficacy in classroom management / Metric (All)
b. Weighted Least Squares Regression - Weighted by Teacher Final Weight

Role of the Observer

An OLS regression was run to predict classroom management teacher self-efficacy given a teacher's role as the observer in peer observations, while controlling for gender, years of teaching experience, and age. The full model of years of teaching experience, gender and the role of the observer to predict classroom management teacher self-efficacy was statistically significant, $R^2 = .171$, $F(8, 1080466) = 27883.083$, $p < .001$; adjusted $R^2 = .171$, which suggests that the model explains 17.1% of the total variance in the dependent variable. Before controlling for gender and years of teaching experience, the model including only the ever an observer variable was statistically significant and explains 4.1% of the total variance in data (Table 41). Thus, simply by knowing if a teacher had ever served as a peer observer accounts for 4.1% of the variance in classroom management teacher self-efficacy.

Table 41 - OLS Model Summary - Classroom Management TSE and Observer

					Change statistics				
	R	R Squared	Adj. R Squared	Std. Error of the estimate	R Square Change	F Change	df1	df2	Sig. F change
1	.202[a]	.041	.041	84.975	.041	45984.209	1	1080473	.000
2	.242[b]	.058	.058	84.190	.018	20257.362	1	1080472	.000
3	.414[c]	.171	.171	78.993	.113	24473.607	6	1080466	.000

a. Predictors: (Constant), Ever_Observer
b. Predictors: (Constant), Ever_Observer, Gender
c. Predictors: (Constant), Ever_Observer, Gender, Years_Exp=5.0, Years_Exp=4.0, Years_Exp=3.0, Years_Exp=7.0, Years_Exp=6.0, Years_Exp=2.0

The full model of age, gender and the role of the observer to predict classroom management teacher self-efficacy was statistically significant, $R^2 = .193$, $F(7, 1067978) = 36562.022$, $p < .001$; adjusted $R^2 = .193$, which suggests that the model explains 19.3% of the total variance in the dependent variable. Before controlling for gender and years of teaching experience, the model including only the ever an observer variable was statistically significant and explains 4.0% of the total variance in data (Table 42).

Table 42 - OLS Model Summary Classroom Management TSE and Observer

					Change statistics				
	R	R Squared	Adj. R Squared	Std. Error of the estimate	R Square Change	F Change	df1	df2	Sig. F change
1	.200[a]	.040	.040	85.147	.040	44690.536	1	1067983	.000
2	.241[b]	.058	.058	84.350	.018	20289.433	1	1067982	.000
3	.440[c]	.193	.193	78.059	.135	35813.601	5	1067977	.000

a. Predictors: (Constant), Ever_Observer
b. Predictors: (Constant), Ever_Observer, Gender
c. Predictors: (Constant), Ever_Observer, Gender, TCHAGEGR=30-39, TCHAGEGR=25-29, TCHAGEGR=60 and above, TCHAGEGR=40-49, TCHAGEGR=50-59

Table 43 shows that while controlling for gender and years of experience, observing a peer had a positive effect on classroom management teacher self-efficacy, $\beta = .143$, $t(1080474) = 151.216$, $p < .001$. For teachers who observed a peer, classroom management teacher self-efficacy was higher, on average, by .687 units. Additionally, the correlation coefficients for

gender and years of experience confirm the results of the bivariate analyses: female teachers have higher classroom management teacher self-efficacy, and classroom management teacher self-efficacy increases with years of experience until it decreases for the very most experienced teachers.

Table 43 - OLS Regression Coefficients - Classroom Management TSE and Observer

Model		B	SE	β	t	p
1	(Constant)	11.875	.002		4842.922	.000
	Ever_Observer	.973	.005	.202	214.439	.000
2	(Constant)	12.293	.004		3225.819	.000
	Ever_Observer	.968	.004	.201	215.357	.000
	Gender	-.620	.004	-.133	-142.328	.000
3	(Constant)	12.127	.005		2564.532	.000
	Ever_Observer	.687	.005	.143	151.216	.000
	Gender	-.646	.004	-.139	-148.124	.000
	Years_Exp=2.0	.270	.006	.047	46.154	.000
	Years_Exp=3.0	.860	.007	.119	122.534	.000
	Years_Exp=4.0	.880	.008	.109	114.231	.000
	Years_Exp=5.0	1.735	.008	.204	216.581	.000
	Years_Exp=6.0	1.083	.008	.136	140.032	.000
	Years_Exp=7.0	-1.084	.006	-.172	-174.920	.000

a. Dependent Variable: Self-efficacy in classroom management / Metric (All)
b. Weighted Least Squares Regression – Weighted by Teacher Final Weight

Table 44 shows that while controlling for gender and age, observing a peer had a positive effect on classroom management teacher self-efficacy, $\beta = .133$, $t(1067985) = 148.231$, $p < .001$. For teachers who observed a peer, classroom management teacher self-efficacy was higher, on average, by .643 units.

Table 44 - OLS Regression Coefficients - Classroom Management TSE and Observer

Model		B	SE	β	t	p
1	(Constant)	11.876	.002		4830.211	.000
	Observed	.966	.005	.200	211.401	.000
2	(Constant)	12.296	.004		3213.794	.000
	Observed	.962	.005	.200	212.426	.000
	Gender	-.623	.004	-.134	-142.441	.000
3	(Constant)	12.626	.018		715.964	.000
	Observed	.643	.004	.133	148.231	.000
	Gender	-.681	.004	-.146	-164.953	.000
	TCHAGEGR=25-29	.145	.020	.013	7.254	.000
	TCHAGEGR=30-39	-.218	.018	-.045	-12.359	.000
	TCHAGEGR=40-49	1.285	.018	.233	72.176	.000
	TCHAGEGR=50-59	-.948	.018	-.214	-54.066	.000
	TCHAGEGR=60+	.004	.019	.000	.209	.000

a. Dependent Variable: Self-efficacy in classroom management / Metric (All)
b. Weighted Least Squares Regression - Weighted by Teacher Final Weight

Instruction Teacher Self-Efficacy and Peer Observation Role While Controlling for Teacher Characteristics

Role of the Observed

An OLS regression was run to predict instruction teacher self-efficacy given a teacher's role as the observed in peer observations, while controlling for gender, years of teaching experience, and age. The full model of years of teaching experience, gender and the role of the observed to predict instruction teacher self-efficacy was statistically significant, $R^2 = .320$, $F(8, 1077835) = 63284.572$, $p < .001$; adjusted $R^2 = .320$, which suggests that the model explains 32% of the total variance in data. Before controlling for gender and years of teaching experience, the model including only the ever an observer variable was statistically significant and explains 5.4% of the total variance in data (Table 45).

Table 45 - OLS Model Summary - Instruction TSE and Observed

					Change statistics				
	R	R Squared	Adj. R Squared	Std. Error of the estimate	R Square Change	F Change	df1	df2	Sig. F change
1	.232[a]	.054	.054	82.606	.054	61367.839	1	1077841	.000
2	.501[b]	.251	.251	73.489	.197	284005.200	1	1077840	.000
3	.565[c]	.320	.320	70.052	.068	18063.499	6	1077834	.000

a. Predictors: (Constant), Observed
b. Predictors: (Constant), Observed, Gender
c. Predictors: (Constant), Observed, Gender, Years_Exp=4.0, Years_Exp=5.0, Years_Exp=3.0, Years_Exp=7.0, Years_Exp=2.0, Years_Exp=6.0

The full model of age, gender and the role of the observed to predict instruction teacher self-efficacy was statistically significant, $R^2 = .284$, $F(8, 1065363) = 60485.298$, $p < .001$; adjusted $R^2 = .284$, which suggests that the model explains 32% of the total variance in data. Before controlling for gender and years of teaching experience, the model including only the ever an observer variable was statistically significant and explains 5.3% of the total variance in data (Table 46).

Table 46 - OLS Model Summary - Instruction TSE and Observed

					Change statistics				
	R	R Squared	Adj. R Squared	Std. Error of the estimate	R Square Change	F Change	df1	df2	Sig. F change
1	.229[a]	.053	.053	82.802	.053	59114.491	1	1065352	.000
2	.501[b]	.251	.251	73.598	.199	283120.146	1	1065351	.000
3	.533[c]	.284	.284	71.963	.033	9798.650	5	1065346	.000

a. Predictors: (Constant), Observed
b. Predictors: (Constant), Observed, Gender
c. Predictors: (Constant), Observed, Gender, TCHAGEGR=30-39, TCHAGEGR=25-29, TCHAGEGR=60 and above, TCHAGEGR=40-49, TCHAGEGR=50-59

Table 47 shows that while controlling for gender and years of experience, being observed had a negative effect on instruction teacher self-efficacy, $\beta = -.215$, $t(1077843) = -263.547$, $p < .001$. For teachers who were observed by a peer, instruction teacher self-efficacy was lower, on average, by .982 units.

Table 47 - OLS Regression Coefficients - Instruction TSE and Observed

Model		B	SE	β	t	p
1	(Constant)	12.391	.002		5059.326	.000
	Observed	-1.058	.004	-.232	-247.725	.000
2	(Constant)	11.046	.003		3313.836	.000
	Observed	-1.110	.004	-.244	-292.165	.000
	Gender	2.026	.004	.444	532.921	.000
3	(Constant)	10.853	.004		2473.269	.000
	Observed	-.982	.004	-.215	-263.547	.000
	Gender	1.970	.004	.432	509.883	.000
	Years_Exp=2.0	-.152	.005	-.027	-30.436	.000
	Years_Exp=3.0	.840	.006	.119	138.275	.000
	Years_Exp=4.0	.588	.007	.074	87.736	.000
	Years_Exp=5.0	1.825	.007	.220	259.435	.000
	Years_Exp=6.0	-.119	.007	-.015	-17.078	.000
	Years_Exp=7.0	-.273	.005	-.044	-49.628	.000

a. Dependent Variable: Self-efficacy in instruction / Metric (All)
b. Weighted Least Squares Regression – Weighted by Teacher Final Weight

Table 48 shows that while controlling for gender and age, being observed had a negative effect on instruction teacher self-efficacy, $\beta = -.218$, $t(1065353) = -260.422$, $p < .001$. For teachers who were observed by a peer, instruction teacher self-efficacy was lower, on average, by .991 units.

Table 48 - OLS Regression Coefficients - Instruction and Observed

Table
OLS Regression Coefficients – Instruction TSE & Observed

Model		B	SE	β	t	p
1	(Constant)	12.379	.002		5025.411	.000
	Observed	-1.043	.004	-.229	-243.135	.000
2	(Constant)	11.030	.003		3292.678	.000
	Observed	-1.095	.004	-.241	-287.172	.000
	Gender	2.032	.004	.446	532.090	.000
3	(Constant)	11.579	.016		714.002	.000
	Observed	-.991	.004	-.218	-260.422	.000
	Gender	2.097	.004	.460	550.465	.000
	TCHAGEGR=25-29	-.013	.018	-.001	-.694	.000
	TCHAGEGR=30-39	-1.017	.016	-.215	-62.512	.000
	TCHAGEGR=40-49	-.185	.016	-.034	-11.259	.000
	TCHAGEGR=50-59	-.765	.016	-.176	-47.287	.000
	TCHAGEGR=60+	.262	.018	.029	14.883	.000

a. Dependent Variable: Self-efficacy in instruction / Metric (All)
b. Weighted Least Squares Regression - Weighted by Teacher Final Weight

Role of the Observer

An OLS regression was run to predict instruction teacher self-efficacy given a teacher's role as the observer in peer observations, while controlling for gender, years of teaching experience, and age. The full model of years of teaching experience, gender and the role of the observer to predict instruction teacher self-efficacy was statistically significant, $R^2 = .300$, $F(8, 1080241) = 57778.110$, $p < .001$; adjusted $R^2 = .300$, which suggests that the model explains 30% of the total variance in data. Before controlling for gender and years of teaching experience, the model including only the ever observer variable was statistically significant and explains 3.5% of the total variance in data (Table 49).

Table 49- OLS Model Summary - Instruction TSE and Observer

					Change statistics				
	R	R Squared	Adj. R Squared	Std. Error of the estimate	R Square Change	F Change	df1	df2	Sig. F change
1	.188[a]	.035	.035	83.381	.035	39513.743	1	1080248	.000
2	.478[b]	.228	.228	74.572	.193	270295.158	1	1080247	.000
3	.547[c]	.300	.300	71.043	.071	18330.333	6	1080241	.000

a. Predictors: (Constant), Ever_Observer
b. Predictors: (Constant), Ever_Observer, Gender
c. Predictors: (Constant), Ever_Observer, Gender, Years_Exp=5.0, Years_Exp=4.0, Years_Exp=3.0, Years_Exp=7.0, Years_Exp=6.0, Years_Exp=2.0

The full model of age, gender and the role of the observer to predict instruction teacher self-efficacy was statistically significant, $R^2 = .261$, $F(7, 1067760) = 53835.299$, $p < .001$; adjusted $R^2 = .300$, which suggests that the model explains 26.1% of the total variance in data. Before controlling for gender and years of teaching experience, the model including only the ever observer variable was statistically significant and explains 3.4% of the total variance in data (Table 50).

Table 50 - OLS Model Summary - Instruction TSE and Observer

					Change statistics				
	R	R Squared	Adj. R Squared	Std. Error of the estimate	R Square Change	F Change	df1	df2	Sig. F change
1	.184[a]	.034	.034	83.580	.034	37523.850	1	1067758	.000
2	.478[b]	.229	.229	74.689	.195	269345.246	1	1067757	.000
3	.511[c]	.261	.261	73.108	.032	9336.705	5	1067752	.000

a. Predictors: (Constant), Ever_Observer
b. Predictors: (Constant), Ever_Observer, Gender
c. Predictors: (Constant), Ever_Observer, Gender, TCHAGEGR=30-39, TCHAGEGR=25-29, TCHAGEGR=60 and above, TCHAGEGR=40-49, TCHAGEGR=50-59

Table 51 shows that while controlling for gender and years of experience, observing a peer had a positive effect on instruction teacher self-efficacy, $\beta = .168$, $t(1080249) = 193.584$, $p < .001$. For teachers who observed a peer, instruction teacher self-efficacy was higher, on average, by .791 units.

Table 51 - OLS Regression Coefficients - Instruction TSE and Observer

Model		B	SE	β	t	p
1	(Constant)	11.785	.002		4898.176	.000
	Ever_Observer	.885	.004	.188	198.781	.000
2	(Constant)	10.433	.003		3090.876	.000
	Ever_Observer	.900	.004	.191	226.207	.000
	Gender	2.005	.004	.439	519.899	.000
3	(Constant)	10.316	.004		2425.543	.000
	Ever_Observer	.791	.004	.168	193.584	.000
	Gender	2.046	.004	.448	521.397	.000
	Years_Exp=2.0	-.485	.005	-.086	-92.287	.000
	Years_Exp=3.0	.691	.006	.098	109.440	.000
	Years_Exp=4.0	.389	.007	.049	56.173	.000
	Years_Exp=5.0	1.772	.007	.213	246.042	.000
	Years_Exp=6.0	.262	.007	.034	37.668	.000
	Years_Exp=7.0	-.302	.006	-.049	-54.168	.000

a. Dependent Variable: Self-efficacy in Instruction / Metric (All)
b. Weighted Least Squares Regression – Weighted by Teacher Final Weight

Table 52 shows that while controlling for gender and age, observing a peer had a positive effect on instruction teacher self-efficacy, $\beta = .153$, $t(1067760) = 177.982$, $p < .001$. For teachers who observed a peer, instruction teacher self-efficacy was higher, on average, by .723 units.

Table 52 - OLS Regression Coefficients - Instruction TSE and Observer

Model		B	SE	β	t	p
1	(Constant)	11.785	.002		4883.043	.000
	Ever_Observer	.869	.004	.184	193.711	.000
2	(Constant)	10.429	.003		3078.288	.000
	Ever_Observer	.883	.004	.187	220.313	.000
	Gender	2.011	.004	.441	518.985	.000
3	(Constant)	11.129	.017		673.792	.000
	Ever_Observer	.723	.004	.153	177.982	.000
	Gender	2.060	.004	.452	532.601	.000
	TCHAGEGR=25-29	-.293	.019	-.026	-15.698	.000
	TCHAGEGR=30-39	-1.058	.017	-.223	-64.000	.000
	TCHAGEGR=40-49	-.154	.017	-.029	-9.242	.000
	TCHAGEGR=50-59	-.851	.016	-.196	-51.768	.000
	TCHAGEGR=60+	.110	.018	.012	6.141	.000

a. Dependent Variable: Self-efficacy in instruction / Metric (All)
b. Weighted Least Squares Regression - Weighted by Teacher Final Weight

Student Engagement Self-Efficacy and Peer Observation Role While Controlling for Teacher Characteristics

Role of the Observed

An OLS regression was run to predict student engagement teacher self-efficacy given a teacher's role as the observed teacher in peer observations, while controlling for gender, years of teaching experience, and age. The full model of years of teaching experience, gender and the role of the observed to predict student engagement teacher self-efficacy was statistically significant, $R^2 = .318$, $F(8, 1078059) = 62818.084$, $p < .001$; adjusted $R^2 = .318$, which suggests that the model explains 31.8% of the total variance in data. Before controlling for gender and years of teaching experience, the model including only the ever observed variable was statistically significant and explains 10.2% of the total variance in data (Table 53).

Table 53 - OLS Model Summary - Student Engagement TSE and Observed

					Change statistics				
	R	R Squared	Adj. R Squared	Std. Error of the estimate	R Square Change	F Change	df1	df2	Sig. F change
1	.319[a]	.102	.102	93.396	.102	122376.940	1	1078066	.000
2	.329[b]	.108	.108	93.083	.006	7266.492	1	1078065	.000
3	.564[c]	.318	.318	81.393	.210	55318.224	6	1078059	.000

a. Predictors: (Constant), Observed
b. Predictors: (Constant), Observed, Gender
c. Predictors: (Constant), Observed, Gender, Years_Exp=4.0, Years_Exp=5.0, Years_Exp=3.0, Years_Exp=7.0, Years_Exp=2.0, Years_Exp=6.0

The full model of age, gender and the role of the observed to predict student engagement teacher self-efficacy was statistically significant, $R^2 = .154$, $F(7, 1065578) = 27775.105$, $p < .001$; adjusted $R^2 = .154$, which suggests that the model explains 31.8% of the total variance in

data. Before controlling for gender and age, the model including only the ever observed variable was statistically significant and explains 10.1% of the total variance in data (Table 54).

Table 54 - OLS Model Summary - Student Engagement TSE and Observed

					Change statistics				
	R	R Squared	Adj. R Squared	Std. Error of the estimate	R Square Change	F Change	df1	df2	Sig. F change
1	.317[a]	.101	.101	93.656	.101	119129.999	1	1065576	.000
2	.327[b]	.107	.107	93.322	.006	7638.675	1	1065575	.000
3	.393[c]	.154	.154	90.815	.047	11931.711	5	1065570	.000

a. Predictors: (Constant), Observed
b. Predictors: (Constant), Observed, Gender
c. Predictors: (Constant), Observed, Gender, TCHAGEGR=30-39, TCHAGEGR=25-29, TCHAGEGR=60 and above, TCHAGEGR=40-49, TCHAGEGR=50-59

Table 55 shows that while controlling for gender and years of experience, being observed had a negative effect on student engagement teacher self-efficacy, $\beta = -.261$, $t(1078067) = -318.549$, $p < .001$. For teachers who were observed by a peer, student engagement teacher self-efficacy was lower, on average, by 1.379 units. Additionally, the correlation coefficients for gender and years of experience confirm the results of the bivariate analyses: female teachers have higher student engagement teacher self-efficacy, and student engagement teacher self-efficacy increases and decreases with years of experience with the lowest levels of self-efficacy at the later part of a career.

Table 55 - OLS Regression Coefficients - Student Engagement TSE and Observed

Model		B	SE	β	t	p
1	(Constant)	11.933	.003		4309.508	.000
	Observed	-1.688	.005	-.319	-349.824	.000
2	(Constant)	12.205	.004		2890.754	.000
	Observed	-1.678	.005	-.317	-348.677	.000
	Gender	-.411	.005	-.078	-85.244	.000
3	(Constant)	12.921	.005		2534.178	.000
	Observed	-1.379	.004	-.261	-318.549	.000
	Gender	-.570	.004	-.108	-126.969	.000
	Years_Exp=2.0	-2.027	.006	-.310	-349.680	.000
	Years_Exp=3.0	.096	.007	.012	13.543	.000
	Years_Exp=4.0	-.599	.008	-.065	-76.872	.000
	Years_Exp=5.0	1.028	.008	.107	125.810	.000
	Years_Exp=6.0	-.160	.008	-.018	-19.703	.000
	Years_Exp=7.0	-2.656	.006	-.372	-416.063	.000

a. Dependent Variable: Self-efficacy in student engagement / Metric (All)
b. Weighted Least Squares Regression – Weighted by Teacher Final Weight

Table 56 shows that while controlling for gender and age, being observed had a negative effect on student engagement teacher self-efficacy, $\beta = -.292$, $t(1065578) = -320.492$, $p < .001$. For teachers who were observed by a peer, student engagement teacher self-efficacy was lower, on average, by 1.540 units.

Table 56 - OLS Regression Coefficients - Student Engagement TSE and Observed

Model		B	SE	β	t	p
1	(Constant)	11.924	.003		4279.761	.000
	Observed	-1.674	.005	-.317	-345.152	.000
2	(Constant)	12.204	.004		2873.358	.000
	Observed	-1.663	.005	-.315	-344.019	.000
	Gender	-.423	.005	-.080	-87.400	.000
3	(Constant)	11.892	.020		581.112	.000
	Observed	-1.540	.005	-.292	-320.492	.000
	Gender	-.329	.005	-.062	-68.504	.000
	TCHAGEGR=25-29	1.220	.023	.093	52.760	.000
	TCHAGEGR=30-39	.743	.021	.135	36.199	.000
	TCHAGEGR=40-49	.168	.021	.027	8.134	.000
	TCHAGEGR=50-59	-.352	.020	-.070	-17.249	.000
	TCHAGEGR=60+	1.106	.022	.104	49.778	.000

a. Dependent Variable: Self-efficacy in student engagement / Metric (All)
b. Weighted Least Squares Regression - Weighted by Teacher Final Weight

Role of the Observer

An OLS regression was run to predict student engagement teacher self-efficacy given a teacher's role as the observer in peer observations, while controlling for gender, years of teaching experience, and age. The full model of years of teaching experience, gender and the role of the observer to predict student engagement teacher self-efficacy was statistically significant, $R^2 = .269$, $F(8, 1080466) = 49646.254$, $p < .001$; adjusted $R^2 = .269$, which suggests that the model explains 26.9% of the total variance in data. Before controlling for gender and years of teaching experience, the model including only the ever an observer variable was statistically significant and explains 0.9% of the total variance in data (Table 57).

Table 57 - OLS Model Summary - Student Engagement and Observer

					Change statistics				
	R	R Squared	Adj. R Squared	Std. Error of the estimate	R Square Change	F Change	df1	df2	Sig. F change
1	.093[a]	.009	.009	98.071	.009	9333.119	1	1080473	.000
2	.126[b]	.016	.016	97.714	.007	7903.693	1	1080472	.000
3	.518[c]	.269	.269	84.223	.253	62312.826	6	1080466	.000

a. Predictors: (Constant), Ever_Observer
b. Predictors: (Constant), Ever_Observer, Gender
c. Predictors: (Constant), Ever_Observer, Gender, Years_Exp=5.0, Years_Exp=4.0, Years_Exp=3.0, Years_Exp=7.0, Years_Exp=6.0, Years_Exp=2.0

The full model of age, gender and the role of the observer to predict student engagement teacher self-efficacy was statistically significant, $R^2 = .074$, $F(8, 1067985) = 12262.968$, $p < .001$; adjusted $R^2 = .074$, which suggests that the model explains 7.4% of the total variance in data. Before controlling for gender and age, the model including only the ever an observer variable was statistically significant and explains .8% of the total variance in data (Table 58).

Table 58 - OLS Model Summary - Student Engagement TSE and Observer

					Change statistics				
	R	R Squared	Adj. R Squared	Std. Error of the estimate	R Square Change	F Change	df1	df2	Sig. F change
1	.090[a]	.008	.008	98.289	.008	8735.629	1	1067983	.000
2	.125[b]	.016	.016	97.910	.008	8272.052	1	1067982	.000
3	.273[c]	.074	.074	94.948	.059	13536.675	5	1067977	.000

a. Predictors: (Constant), Ever_Observer
b. Predictors: (Constant), Ever_Observer, Gender
c. Predictors: (Constant), Ever_Observer, Gender, TCHAGEGR=30-39, TCHAGEGR=25-29, TCHAGEGR=60 and above, TCHAGEGR=40-49, TCHAGEGR=50-59

Table 59 shows that while controlling for gender and years of experience, observing a peer had a positive effect on student engagement teacher self-efficacy, $\beta = .137$, $t(1080474) = 154.961$, $p < .001$. For teachers who observed a peer, student engagement teacher self-efficacy was higher, on average, by .750 units. Additionally, the correlation coefficients for gender and years of experience confirm the results of the bivariate analyses: female teachers have higher

student engagement teacher self-efficacy, and student engagement teacher self-efficacy increases and decreases with years of experience, with the lowest level of teacher self-efficacy being at the end of a career.

Table 59 - OLS Regression Coefficients - Student Engagement TSE and Observer

Model		B	SE	β	t	p
1	(Constant)	11.230	.003		3968.394	.000
	Ever_Observer	.506	.005	.093	96.608	.000
2	(Constant)	11.533	.004		2607.575	.000
	Ever_Observer	.502	.005	.092	96.285	.000
	Gender	-.449	.005	-.085	-88.903	.000
3	(Constant)	12.232	.005		2426.024	.000
	Ever_Observer	.750	.005	.137	154.961	.000
	Gender	-.484	.005	-.091	-104.134	.000
	Years_Exp=2.0	-2.367	.006	-.363	-380.017	.000
	Years_Exp=3.0	.013	.007	.002	1.761	.000
	Years_Exp=4.0	-.757	.008	-.082	-92.139	.000
	Years_Exp=5.0	1.061	.009	.110	124.286	.000
	Years_Exp=6.0	.357	.008	.039	43.237	.000
	Years_Exp=7.0	-2.682	.007	-.375	-405.956	.000

a. Dependent Variable: Self-efficacy in Student Engagement / Metric (All)
b. Weighted Least Squares Regression – Weighted by Teacher Final Weight

Table 60 shows that while controlling for gender and age, observing a peer had a positive effect on student engagement teacher self-efficacy, $\beta = .041$, $t(1067985) = 42.976$, $p < .001$. For teachers who observed a peer, student engagement teacher self-efficacy was higher, on average, by .227 units.

Table 60 - OLS Regression Coefficients - Student Engagement TSE and Observer

Model		B	SE	β	t	p
1	(Constant)	11.230	.003		3956.781	.000
	Ever_Observer	.493	.005	.090	93.465	.000
2	(Constant)	11.541	.004		2598.732	.000
	Ever_Observer	.490	.005	.089	93.205	.000
	Gender	-.462	.005	-.087	-90.951	.000
3	(Constant)	11.503	.021		536.279	.000
	Ever_Observer	.227	.005	.041	42.976	.000
	Gender	-.377	.005	-.071	-74.958	.000
	TCHAGEGR=25-29	1.089	.024	.083	44.942	.000
	TCHAGEGR=30-39	.608	.021	.110	28.313	.000
	TCHAGEGR=40-49	.242	.022	.039	11.180	.000
	TCHAGEGR=50-59	-.630	.021	-.125	-29.543	.000
	TCHAGEGR=60+	.979	.023	.092	42.131	.000

a. Dependent Variable: Self-efficacy in student engagement / Metric (All)
b. Weighted Least Squares Regression - Weighted by Teacher Final Weight

Overall Self-Efficacy and Peer Observation Role While Controlling for Teacher Characteristics

Role of the Observed

An OLS regression was run to predict overall teacher self-efficacy given a teacher's role as the observed teacher in peer observations, while controlling for gender, years of teaching experience, and age. The full model of years of teaching experience, gender and the role of the observed to predict overall teacher self-efficacy was statistically significant, $R^2 = .320$, $F(8, 1077835) = 63482.377$, $p < .001$; adjusted $R^2 = .320$, which suggests that the model explains 32% of the total variance in data. Before controlling for gender and years of teaching experience, the model including only the ever observed variable was statistically significant and explains 15.9% of the total variance in data (Table 61).

Table 61 - OLS Model Summary - Overall TSE and Observed

					Change statistics				
	R	R Squared	Adj. R Squared	Std. Error of the estimate	R Square Change	F Change	df1	df2	Sig. F change
1	.398[a]	.159	.159	76.330	.159	203087.257	1	1077841	.000
2	.408[b]	.167	.167	75.955	.008	10669.549	1	1077840	.000
3	.566[c]	.320	.320	68.604	.153	40562.270	6	1077834	.000

a. Predictors: (Constant), Observed
b. Predictors: (Constant), Observed, Gender
c. Predictors: (Constant), Observed, Gender, Years_Exp=4.0, Years_Exp=5.0, Years_Exp=3.0, Years_Exp=7.0, Years_Exp=2.0, Years_Exp=6.0

The full model of age, gender and the role of the observed to predict overall teacher self-efficacy was statistically significant, $R^2 = .225$, $F(7, 1065353) = 44181.463$, $p < .001$; adjusted $R^2 = .225$, which suggests that the model explains 22.5% of the total variance in data. Before controlling for gender and years of teaching experience, the model including only the ever observed variable was statistically significant and explains 15.7% of the total variance in data (Table 62).

Table 62 - OLS Model Summary - Overall TSE and Observed

					Change statistics				
	R	R Squared	Adj. R Squared	Std. Error of the estimate	R Square Change	F Change	df1	df2	Sig. F change
1	.396[a]	.157	.157	76.423	.157	197978.129	1	1065352	.000
2	.406[b]	.165	.165	76.053	.008	10373.623	1	1065351	.000
3	.474[c]	.225	.225	73.264	.060	16534.746	5	1065346	.000

a. Predictors: (Constant), Observed
b. Predictors: (Constant), Observed, Gender
c. Predictors: (Constant), Observed, Gender, TCHAGEGR=30-39, TCHAGEGR=25-29, TCHAGEGR=60 and above, TCHAGEGR=40-49, TCHAGEGR=50-59

Table 63 shows that while controlling for gender and years of experience, being observed had a negative effect on overall teacher self-efficacy, $\beta = -.349$, $t(1078067) = -427.689$, $p < .001$. For teachers who were observed by a peer, overall teacher self-efficacy was lower, on average, by 1.560 units.

Table 63 - OLS Regression Coefficients - Overall TSE and Observed

Model		B	SE	β	t	p
1	(Constant)	12.644	.002		5587.292	.000
	Observed	-1.778	.004	-.398	-450.652	.000
2	(Constant)	12.375	.003		3591.877	.000
	Observed	-1.788	.004	-.401	-455.400	.000
	Gender	.406	.004	.091	103.294	.000
3	(Constant)	12.489	.004		2905.977	.000
	Observed	-1.560	.004	-.349	-427.689	.000
	Gender	.261	.004	.058	68.990	.000
	Years_Exp=2.0	-.616	.005	-.112	-125.953	.000
	Years_Exp=3.0	.717	.006	.103	120.524	.000
	Years_Exp=4.0	.389	.007	.050	59.211	.000
	Years_Exp=5.0	1.764	.007	.217	256.077	.000
	Years_Exp=6.0	.082	.007	.011	11.969	.000
	Years_Exp=7.0	-1.566	.005	-.260	-291.119	.000

a. Dependent Variable: Overall self-efficacy / Metric (All)
b. Weighted Least Squares Regression – Weighted by Teacher Final Weight

Table 64 shows that while controlling for gender and age, being observed had a negative effect on overall teacher self-efficacy, $\beta = -.351$, $t(1078067) = -402.445$, $p < .001$. For teachers who were observed by a peer, overall teacher self-efficacy was lower, on average, by 1.560 units.

Table 64 - OLS Regression Coefficients - Overall TSE and Observed

Model		B	SE	β	t	p
1	(Constant)	12.633	.002		5556.815	.000
	Observed	-1.761	.004	-.396	-444.947	.000
2	(Constant)	12.366	.003		3572.502	.000
	Observed	-1.772	.004	-.398	-449.586	.000
	Gender	.402	.004	.090	101.851	.000
3	(Constant)	12.464	.017		754.946	.000
	Observed	-1.560	.004	-.351	-402.445	.000
	Gender	.446	.004	.100	114.966	.000
	TCHAGEGR=25-29	.635	.019	.058	34.026	.000
	TCHAGEGR=30-39	-.156	.017	-.034	-9.449	.000
	TCHAGEGR=40-49	.479	.017	.091	28.678	.000
	TCHAGEGR=50-59	-.737	.016	-.173	-44.727	.000
	TCHAGEGR=60+	.606	.018	.068	33.813	.000

a. Dependent Variable: Overall self-efficacy/ Metric (All)
b. Weighted Least Squares Regression - Weighted by Teacher Final Weight

Role of the Observer

An OLS regression was run to predict overall teacher self-efficacy given a teacher's role as the observer in peer observations, while controlling for gender, years of teaching experience, and age. The full model of years of teaching experience, gender and the role of the observer to predict classroom management teacher self-efficacy was statistically significant, $R^2 = .235$, $F(8, 1080241) = 41523.075$, $p < .001$; adjusted $R^2 = .235$, which suggests that the model explains 23.5% of the total variance in data. Before controlling for gender and years of teaching experience, the model including only the ever an observer variable was statistically significant and explains 4.0% of the total variance in data (Table 65).

Table 65 - OLS Model Summary - Overall TSE and Observer

					Change statistics				
	R	R Squared	Adj. R Squared	Std. Error of the estimate	R Square Change	F Change	df1	df2	Sig. F change
1	.201[a]	.040	.040	81.468	.040	45516.599	1	1080248	.000
2	.217[b]	.047	.047	81.181	.007	7662.462	1	1080247	.000
3	.485[c]	.235	.235	72.732	.188	44255.317	6	1080241	.000

a. Predictors: (Constant), Ever_Observer
b. Predictors: (Constant), Ever_Observer, Gender
c. Predictors: (Constant), Ever_Observer, Gender, Years_Exp=5.0, Years_Exp=4.0, Years_Exp=3.0, Years_Exp=7.0, Years_Exp=6.0, Years_Exp=2.0

The full model of age, gender and the role of the observer to predict classroom management teacher self-efficacy was statistically significant, $R^2 = .125$, $F(7, 1067752) = 21720.750$, $p < .001$; adjusted $R^2 = .125$, which suggests that the model explains 12.5% of the total variance in data. Before controlling for gender and years of teaching experience, the model including only the ever an observer variable was statistically significant and explains 3.9% of the total variance in data (Table 66).

Table 66 - OLS Model Summary - Overall TSE and Observer

					Change statistics				
	R	R Squared	Adj. R Squared	Std. Error of the estimate	R Square Change	F Change	df1	df2	Sig. F change
1	.198[a]	.039	.039	81.527	.039	43633.048	1	1067758	.000
2	.214[b]	.046	.046	81.245	.007	7433.994	1	1067757	.000
3	.353[c]	.125	.125	77.820	.079	19210.697	5	1067752	.000

a. Predictors: (Constant), Ever_Observer
b. Predictors: (Constant), Ever_Observer, Gender
c. Predictors: (Constant), Ever_Observer, Gender, TCHAGEGR=30-39, TCHAGEGR=25-29, TCHAGEGR=60 and above, TCHAGEGR=40-49, TCHAGEGR=50-59

Table 67 shows that while controlling for gender and years of experience, observing a peer had a positive effect on overall teacher self-efficacy, $\beta = .190$, $t(1080249) = 209.169$, $p <$

.001. For teachers who observed a peer, overall teacher self-efficacy was higher, on average, by .875 units.

Table 67 - OLS Regression Coefficients - Overall TSE and Observer

Model		B	SE	β	t	p
1	(Constant)	11.789	.002		5014.767	.000
	Ever_Observer	.928	.004	.201	213.346	.000
2	(Constant)	11.541	.004		3140.767	.000
	Ever_Observer	.931	.004	.202	214.760	.000
	Gender	.367	.004	.082	87.535	.000
3	(Constant)	11.704	.004		2688.108	.000
	Ever_Observer	.875	.004	.190	209.169	.000
	Gender	.359	.004	.080	89.444	.000
	Years_Exp=2.0	-1.014	.005	-.184	-188.499	.000
	Years_Exp=3.0	.614	.006	.089	95.039	.000
	Years_Exp=4.0	.201	.007	.026	28.303	.000
	Years_Exp=5.0	1.794	.007	.220	243.250	.000
	Years_Exp=6.0	.668	.007	.088	93.821	.000
	Years_Exp=7.0	-1.597	.006	-.265	-279.966	.000

a. Dependent Variable: Overall self-efficacy / Metric (All)
b. Weighted Least Squares Regression – Weighted by Teacher Final Weight

Table 68 shows that while controlling for gender and age, observing a peer had a positive effect on overall teacher self-efficacy, $\beta = .136$, $t(1067760) = 144.562$, $p < .001$. For teachers who observed a peer, overall teacher self-efficacy was higher, on average, by .625 units.

Table 68 - OLS Regression Coefficients - Overall TSE and Observer

Model		B	SE	β	t	p
1	(Constant)	11.789	.002		5007.728	.000
	Ever_Observer	.914	.004	.198	208.885	.000
2	(Constant)	11.544	.004		3132.449	.000
	Ever_Observer	.917	.004	.199	210.195	.000
	Gender	.363	.004	.082	86.221	.000
3	(Constant)	11.933	.018		678.764	.000
	Ever_Observer	.625	.004	.136	144.562	.000
	Gender	.394	.004	.088	95.567	.000
	TCHAGEGR=25-29	.369	.020	.034	18.602	.000
	TCHAGEGR=30-39	-.262	.018	-.057	-14.914	.000
	TCHAGEGR=40-49	.539	.018	.102	30.375	.000
	TCHAGEGR=50-59	-.954	.017	-.225	-54.558	.000
	TCHAGEGR=60+	.429	.019	.048	22.532	.000

a. Dependent Variable: Overall self-efficacy/ Metric (All)
b. Weighted Least Squares Regression - Weighted by Teacher Final Weight

Table 69 is a summary table comparing teacher self-efficacy level in all domains by the role of the participant in peer observations. The results below are controlling for gender and years of experience. Due to years of experience and age being correlated, only years of experience is outlined below.

Table 69 - Summary Findings - Teacher Self-Efficacy and Role in Peer Observation

TSE Domain & Peer Observation Role	R^2	B	β
Classroom Management / Observed	.146	-1.613	-.346
Instruction / Observed	.054	-.982	-.215
Student Engagement / Observed	.102	-1.379	-.261
Overall / Observed	.159	-1.560	-.351
Classroom Management / Observer	.041	.687	.143
Instruction / Observer	.035	.791	.168
Student / Engagement Observer	.009	.750	.137
Overall / Observer	.040	.875	.190

Chapter 5: Discussion

Introduction

There are many actions educators take to improve student success. For example, schools might look to improve their test scores by increasing interventions put in place to meet the needs of specific categories of students (known as tiered interventions). Teachers also keep a close watch on assessments given at the conclusion of a unit to measure student knowledge (summative assessments). Although these practices are important to student success, schools must also look to ensure that teachers feel as self-efficacious as possible. Studies have shown self-efficacy to have positive relationships on effective teaching and students' learning behaviors, which ultimately increases school achievement (Holzberger, Philipp, & Kunter, 2013).

In this chapter, the findings from the previous chapter are synthesized and interpreted. Additionally, the chapter concludes with an outline of policy/practice implications, recommendations, limitations, and areas of future study.

Summary of Findings

Gender and Teacher Self-Efficacy

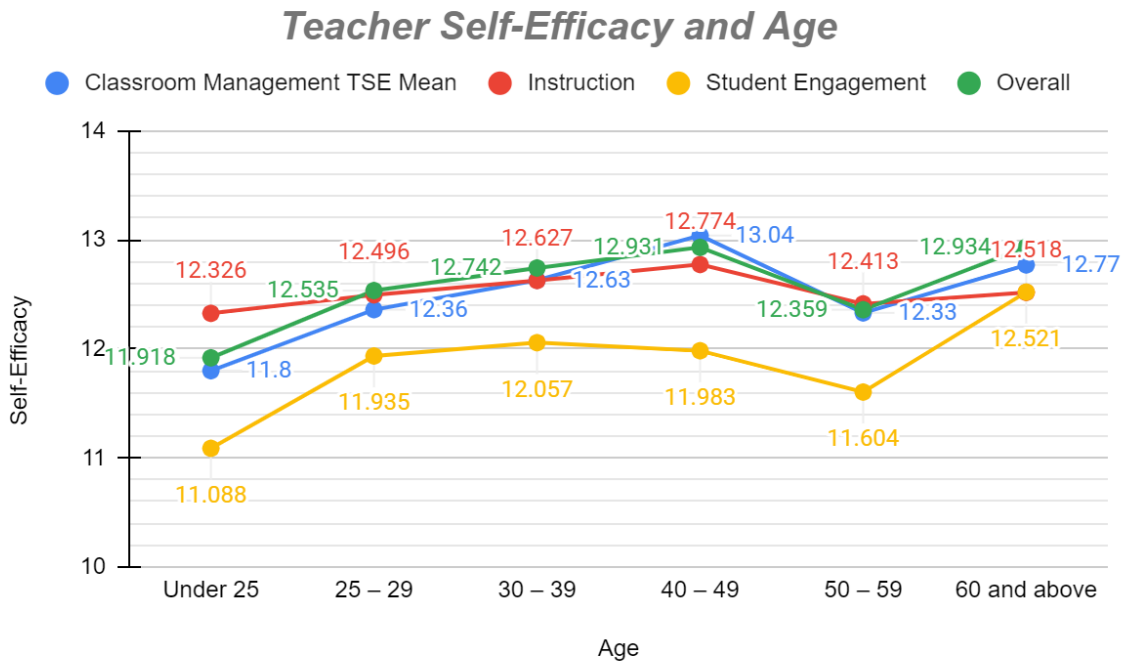
In all domains of teacher self-efficacy, female teachers reported higher levels of self-efficacy than males. Consistent with findings for age, years of experience, and role in peer observations, both males and females had the lowest self-efficacy levels in the domain of student engagement. Additionally, gender had relatively low predictive value for classroom

management, student engagement, and overall teacher self-efficacy, where the predictive value was below 2% in each domain. However, gender had a higher predictive value in the self-efficacy domain of instruction, where gender explained above 19% of the total variance, regardless of the participants role in peer observations (observed or observer).

Age, Years of Experience, and Teacher Self-Efficacy

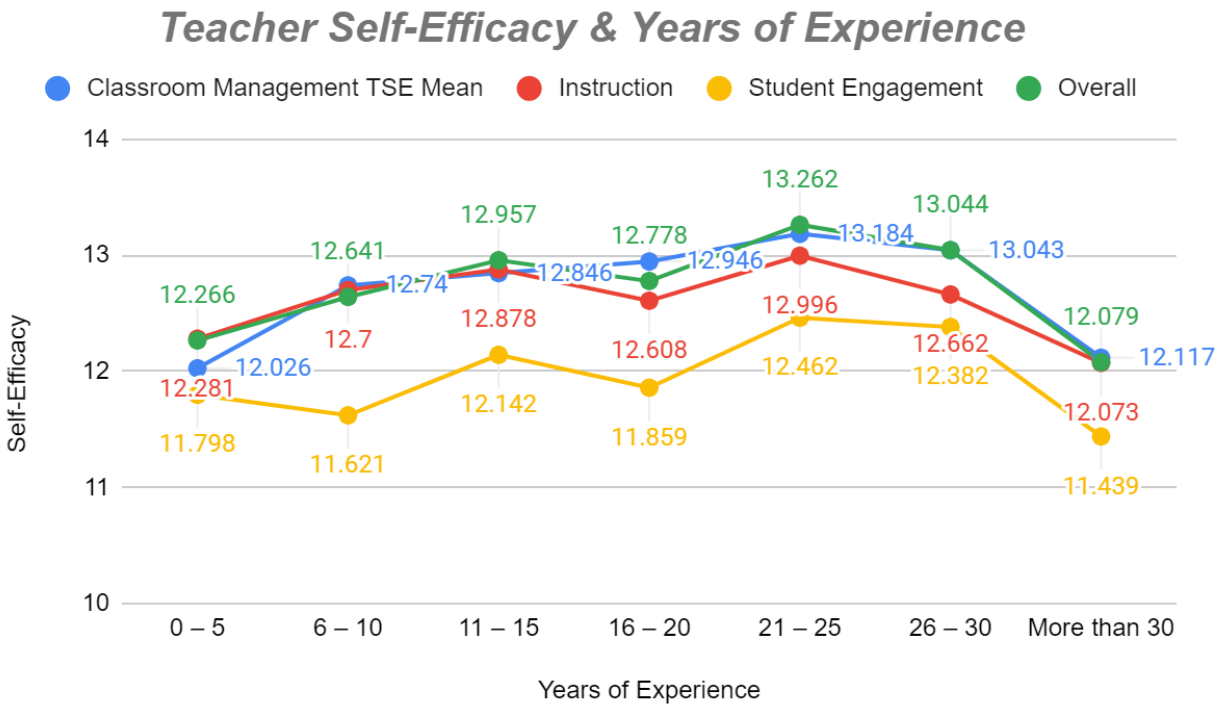
It is important to note that age and years of teaching experience were positively correlated. That is, when they were included in OLS regression analyses together, the model showed high levels of collinearity. Therefore, there are similarities in findings. However, due to teachers entering their career at different life stages, there is not a perfect correlation. Specifically looking at age, Figure 13 shows that across all domains (classroom management, instruction, student engagement, and overall) teacher self-efficacy is at its lowest point when a teacher is under the age of 25. As a teacher gets older their self-efficacy increases until the age range of either 30 through 39 or 40 through 49 depending on the domain. In all domains, once a teacher reaches the age of 60 or older, their self-efficacy increases again.

Figure 13 - Teacher Self-Efficacy and Age



In terms of years of experience, teacher self-efficacy displays an increasing and decreasing relationship (Figure 14). Across all domains, the lowest point of self-efficacy levels was when a teacher had more than 30 years of experience, with the exception of classroom management self-efficacy where more than 30 years of experience yielded the second lowest efficacy level. Additionally, the age range of 21 through 25 yielded the highest level of self-efficacy in each domain. Overall, all domains of self-efficacy follow a similar increasing and decreasing pattern.

Figure 14 - Teacher Self-Efficacy and Years of Experience



Although age and years of experience are correlated, there are differences in findings. The most notable difference is at the end of a teacher's career. With 30 or more years of experience, teacher self-efficacy declines in all three domains. However, teacher self-efficacy at the age of 60 or older increases from the previous age range in each domain.

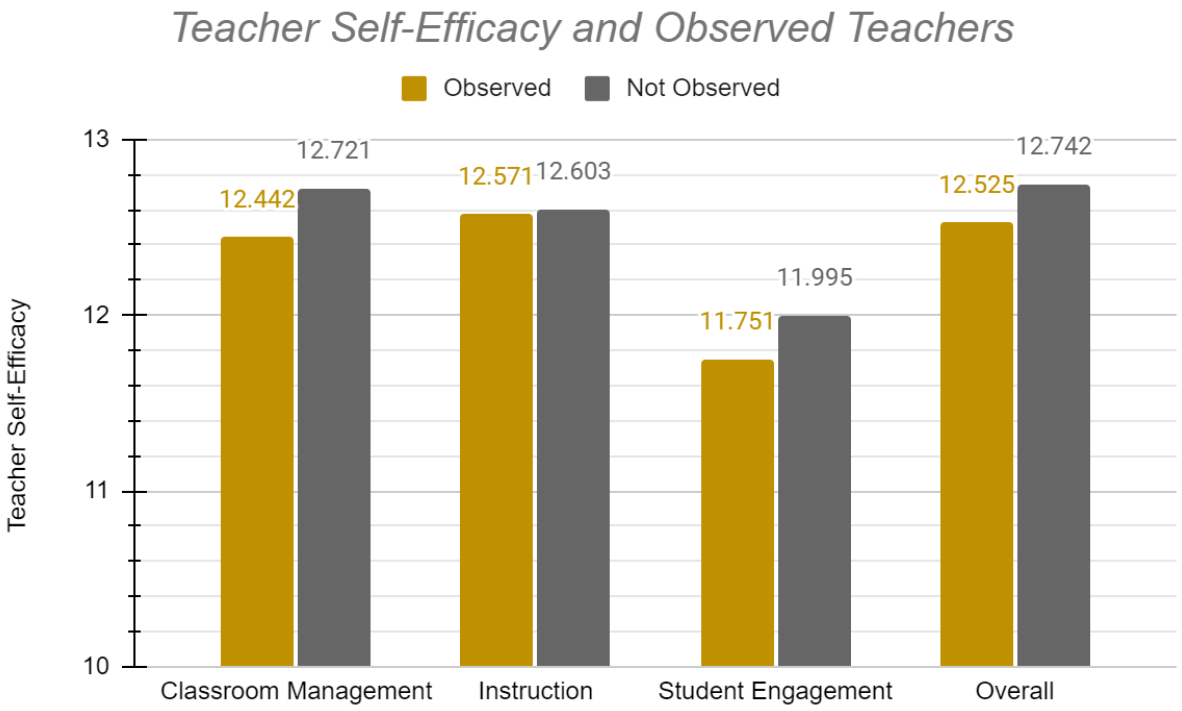
Overall, as an exploratory variable in regression analyses, years of teaching experience had more predictive value than teacher age, with the exception being for classroom management where the predictive values are similar.

Peer Observation

Teachers who were observed experienced lower self-efficacy levels in all domains when compared to teachers who were not observed (Figure 15); however, the effect size was very

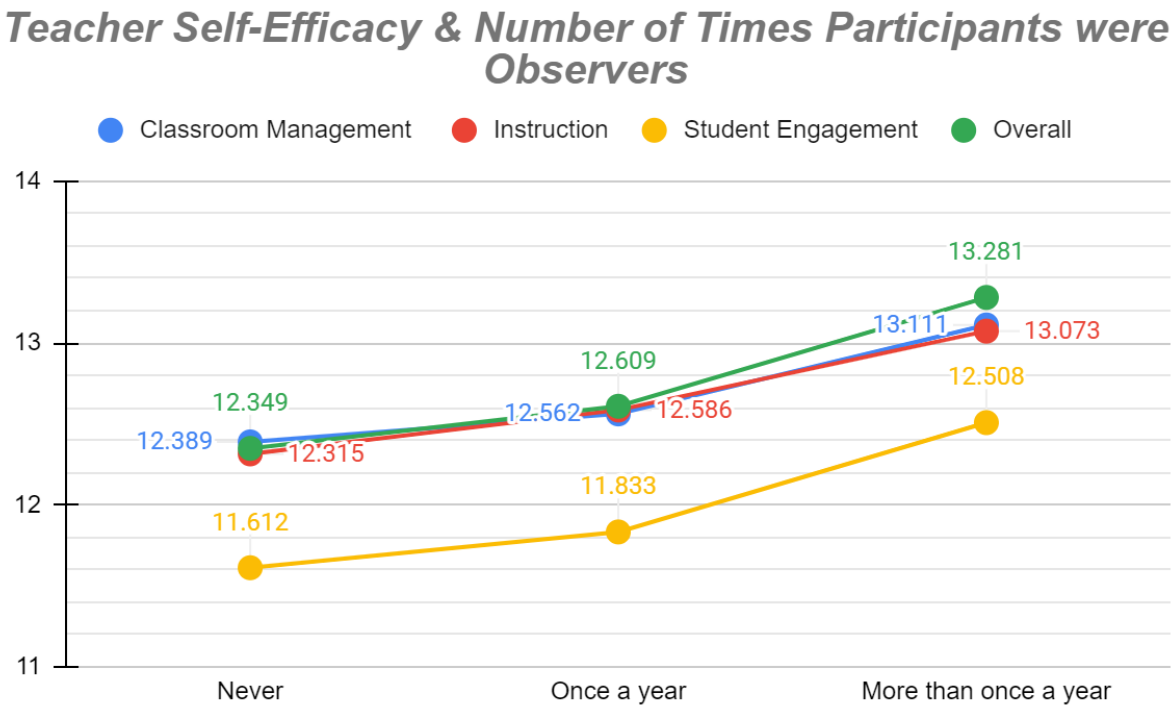
small. As previously stated, even small effect sizes are important in education due to the difficulty of creating measurable impacts.

Figure 15 - Teacher Self-Efficacy and Observed Teachers



Contrastingly, teachers who participated as the observer had increased self-efficacy levels in all domains compared to teachers who did not observe a peer. Therefore, observing a teacher at least once a year was associated with increased self-efficacy levels. Figure 16, displays the relationship between the role of an observer in peer observations and teacher self-efficacy levels in each domain. Consistent with other findings from this research, student engagement teacher self-efficacy had the lowest average self-efficacy level compared to the other domains.

Figure 16 - Teacher Self-Efficacy and the Number of Times Participants were Observers



Moreover, being observed had a more predictive value and a stronger relationship than being an observer in all domains of teacher self-efficacy, where the predictive value for observed was above 10% for all domains except for instruction. Contrastingly, the predictive value for observers was under 5% in each self-efficacy domain.

Discussion

Domains of Teacher Self-Efficacy

Findings from this study indicate that teacher self-efficacy in student engagement had the lowest mean with the highest standard deviation. This suggests that teachers are not as confident in their ability to engage students, and teacher reporting on this measure varies. This can be explained by student engagement being more difficult to influence and measure. Since TALIS is

a self-reported survey, there is no definition or guidance on what makes students engaged, therefore, yielding varied responses. On the other hand, it is easier to identify if a teacher has strong instruction, as it is one of the prime focuses in education. Student achievement, and ultimately teacher achievement, is directly linked to classroom instruction, leading to a targeted instructional focus during professional development for teachers. Furthermore, due to high stress on test scores, teachers are programmed to think of instruction first and student feelings and opinions (student engagement) after, if there is time, which ultimately there is never enough of. The TALIS survey identifies teachers' instructional self-efficacy levels by having them rate their ability on items such as "crafting good questions", and "using a variety of assessment strategies". In terms of student engagement, teachers rate their ability on "getting students to believe they can do well in school", and "helping students value learning". Student engagement is more abstract, where instruction is easier understood and controllable to teachers. Also, many teachers view their jobs as strictly teaching and have the mentality that they will teach and students will learn. The idea of student engagement is often left to the students to self-motivate.

Gender and Teacher Self-Efficacy

As stated, female teachers have higher self-efficacy in all domains. Depending on the domain, this is consistent with some research, but inconsistent with others. For example, Sarfo, Amankwah, Sam, and Konin (20015) found female teachers to have higher self-efficacy in classroom management and instruction, where Klassen and Chiu (2010), and Nejati, Hassani, and Sahrapour (2014), found male teachers to have higher self-efficacy levels. Other studies found no significant difference between male and female teachers in the domain of student engagement (Klassen & Chiu, 2010; Sarfo et al., 2015), where others found male teachers to have higher self-efficacy levels (Nejati et al., 2014).

The findings of the current study, reporting that female teachers have higher self-efficacy in all domains makes sense in the field of education. Historically, teaching has been a female dominated field (Wong, 2019). In the 2017-2018 school year, 76% of teachers were female (U.S. Department of Education, 2021) with less than a quarter of public school teachers being male. Due to this disproportion, male teachers may feel out of place as a teacher and like they could find a job that was higher paying and potentially one that was viewed as a higher status profession. Furthermore, male teachers leave the profession at a rate of 21%, where women leave at a rate of 15% after their fifth year of teaching (Witt, 2015). If male teachers are less likely to stay within the profession, they may not have commitment to their work and feel the drive to excel. Additionally, female teachers often have to work harder than men to receive the same recognition or acknowledgement. Overall, women do not have the space to be anything less than persistent and driven.

Age, Years of Teaching Experience, and Teacher Self-Efficacy

Age and years of teaching experience are positively correlated and share a similar relationship to teacher self-efficacy. It is important to note that the relationship between age and years of experience are not a perfect correlation and do differ in some findings. The most pronounced drop-off in self-efficacy occurs at the end of a teacher's career. At the age of 60 and above, teachers increase in self-efficacy levels compared to the previous age range of 50 through 59. Contrastingly, when teachers have more than 30 years of experience, their self-efficacy levels decline. This could be because a teacher could have 30 or more years of experience and be within the age range of 50 through 59, which reports lower self-efficacy levels in the current study. Overall, teachers enter the profession at a variety of times in their lives. Therefore, a teacher can be in their thirties, forties, or fifties and have less than five years of teaching.

Conducting the study again and looking at years of experience from 30 through 35 and then with more than 35 years experience may assist in finding a more exact year where teacher self-efficacy decreases.

The overall findings of the current study are closely related to previous research on the topic of career stages, which found mid-career individuals (7-18 years in the career) to enter into a stage of experimentation and activism (Day & Gu, 2007; Huberman, 1989; Klassen & Chiu, 2010). To expand on this, if teachers are taking risks and experimenting, their self-efficacy is subject to either increase or decrease depending on the outcomes, as it would be linked to one of the prime sources of teacher self-efficacy: mastery experiences. If a teacher is experiencing success, their self-efficacy levels can increase, but if they experience shortcomings, their self-efficacy can decrease. This would align with the increase and decrease of self-efficacy levels during this time period. Additionally, researchers found that at the end of an individual's career (24 years or more), individuals experience a decline in motivation (Day & Gu, 2007; Huberman, 1989; Klassen & Chiu, 2010), which is consistent with the findings of this current study in regards to self-efficacy. Typically, at the end of a career, teachers are not quick to enhance their instructional practices, but follow the same routine from previous years. With the constant changes in society and the vast personalities of students, this could create difficulty with engaging students, managing a classroom, and implementing instructional practices.

Peer Observations and Teacher Self-Efficacy

Research suggests that there is a reciprocal relationship between an observer and the teacher being observed (Bell, 2005; Hendry & Oliver, 2012). This is not consistent with the results of the current study. In fact, teachers who were observed experienced lower self-efficacy levels in all domains when compared to teachers who were not observed; however, the effect size

was very small. The reason for this could be because teachers may not have received feedback from their observations. Without objective and regular feedback, teachers are less likely to learn, apply and evaluate new strategies and instructional practices, and will not create impactful and meaningful goals for their own professional growth (Birringer-Haig, 2014); therefore, influencing their self-efficacy levels in a negative manner. Furthermore, Hattie (2009) found the feedback that teachers received had a large effect on student achievement. When students are achieving, teachers experience success through mastery experiences, ultimately influencing self-efficacy levels. Therefore, without feedback, teachers are not receiving the guidance they need to influence the teaching and learning environment in a way that can greatly impact their self-efficacy levels.

One of the key aspects of quality peer observations is that the teacher being observed holds control (Bell, 2005). If this was not the case and the teacher felt intimidated or inferior, then it is likely that their self-efficacy level would decline. This is especially true since emotional arousal is one of the four key sources of self-efficacy (Bandura, 1997). In addition, a teacher could have been observed as part of a growth plan, which is unfortunately seen negatively for many teachers. That being said, teachers who fall into this category may have lower self-efficacy to begin with and their growth is not being fostered by being mandated to be observed. Furthermore, teachers on growth plans are typically observed more often than a teacher not on a growth plan. Because of this, even if a peer were to come in to perform a non-evaluative observation, it could still be perceived as a negative.

Overall, although education is viewed as a collaborative process where teachers must work together for the common good of all students, being observed and opening classroom doors to peers is still seen as an intrusive practice. Although peer observations are not supposed to be

evaluative, that does not mean that teachers do not feel evaluated when peers enter their classroom. Stress levels rise and teachers often perceive they are losing their sense of control because they feel the need to cater to their peers performing the observation. These feelings negatively impact self-efficacy levels through emotional arousal. Once teachers feel stressed and evaluated, their instruction may be impacted and the chance may decline of mastery experiences occurring. This, again, would negatively affect self-efficacy levels.

Contrastingly, teachers who were observers of peers experienced higher self-efficacy levels in all domains. This may be attributed to being able to see another teacher experience success. Vicarious experiences is one of the four sources of self-efficacy and therefore may have contributed to the increased efficacy levels in observing teachers. This finding also aligns with Hendry and Oliver (2012), and Mousavi (2014) who found that observers of teachers can in fact benefit more than their peer counterparts. Furthermore, teachers who are observing their peers are not in the vulnerable position that the observed teacher is in, and therefore, do not have strong negative effects on their emotional arousal, a prime source of teacher self-efficacy.

Furthermore, depending on the type of peer observation, observers may be perceived as more effective instructors so being tasked to be part of this team of observers could increase self-efficacy levels. The opposite may also be true for teachers who feel they were not given the opportunity to observe their peers. These individuals could feel inferior and their self-efficacy could ultimately decline.

Moreover, like most humans, teachers strive for validation. When observing a peer, teachers have the opportunity to validate their own work. Even seeing the shortfalls of a peer, a teacher can validate their own instruction by feeling superior and better about their own practice. A practice which is supposed to be unobtrusive and friendly, may turn into a practice where the

observing teacher gets a sense of confidence through seeing the stress and missteps of their peers. Ultimately, the teacher observing has no negative impact. They have no sense of discomfort or accountability for things going poorly. In fact, they can gain from the other teacher doing poorly by praising their own abilities and partaking, even implicitly, in a game of comparisons.

Additionally, greater impacts on teacher self-efficacy levels in all domains take place when teachers observe a peer more than once a year. When teachers interact with accomplished teachers, they develop more ambitious instructional practices (Coburn & Russell, 2008; Elmore, 1996; Frank, Zhao, & Borman, 2004; Louis, Marks, & Kruse, 1996; Newmann, King, & Youngs, 2000; Penuel, Riel, Krause, & Frank, 2009; Rigby et al., 2017). Observing peers is one type of interaction between teachers, which if done more frequently allows the observer more time to reflect on their practices in order to set goals and make adjustments to their teaching. The more someone watches something, the more likely they would be to learn a new skill. Observations are just another form of practice, and more practice on a particular task can increase one's ability.

Policy/Practice Implications

Findings from this study and other studies indicate that new teachers have lower self-efficacy levels than most more experienced teachers. To foster the self-efficacy levels of early career teachers, districts should incorporate new teacher academies into their training, which consists of a strong focus on classroom management, student engagement, and instruction. To focus on these domains, districts should utilize the four sources of teacher self-efficacy - mastery experiences, emotional arousal, vicarious experiences, and verbal persuasion. In other words,

new teachers should be given opportunities to experience success by setting small, short-term goals that they can accomplish. New teachers should also be given specific verbal praise and feedback on a frequent basis that is non-evaluative. Furthermore, new teachers should be given the opportunity to observe more accomplished teachers in the classroom and have the opportunity to partake in a pre- and post-conversation. These opportunities will allow new teachers the chance to grow in their skill set and gain comfort in their teaching ability.

Additionally, school districts should partner with universities to communicate the importance of building the self-efficacy of future teachers. Incorporating the four sources of self-efficacy into student teaching and practicum opportunities could increase efficacy levels, ultimately increasing the teaching and learning experience when teachers enter their careers. This could mean that student teachers partake in peer observations with their classmates and exchange feedback throughout the process. This could not only assist in efficacy levels, but also create a comfort level with being observed. Additionally, it would create a space where future teachers can share ideas, be acknowledged for their work, and set goals in a safe environment. Unfortunately, society can create the perception that teachers are not acknowledged or respected. By creating the space for teachers to be collaborative and build each other up, more new teachers may feel worthy and respected, therefore, stay in the career longer.

Although the current study shows a negative relationship between being observed and teacher self-efficacy, past research stresses the importance of using feedback in the peer observation model ((Blase & Blase, 1999; Rigby et al., 2017). Since TALIS does not define peer observations for the participants taking the survey, it is impossible to identify if teachers were given feedback or control over their peer observation experience. Therefore, teachers who are

observed must have full control and observations should be conducted in a non-evaluative manner.

Moreover, school leaders must provide teachers with the time to partake in peer observations so it is not just a “checkbox task”. Administrators who value the practice of peer observations and see the benefit in conducting them must make intentional time for teachers to be able to participate in not only the observation but the necessary conversations both leading into the observation and following it. Findings also indicated that the more frequently that a teacher is able to observe a peer, the more positive impact it will have on their self-efficacy levels in all domains. Due to this, leaders must provide the time and space for teachers to be able to take part in the observation of their peers. One way to do this is to have a building substitute teacher who can assist in covering classes so teachers are able to see a variety of teaching practices.

Recommendations

Receiving consistent feedback results in teachers who set impactful and meaningful goals, apply and evaluate new instruction practices, and are more likely to learn (Birringer-Haig, 2014). Since teachers were unable to identify whether they received feedback or commentary from their observations, it would be beneficial for future research to analyze the relationship between teacher self-efficacy and peer observations which included feedback versus those that did not. Ideally, an experimental (or even quasi-experimental) study could be conducted to analyze the difference between teachers who participate in reciprocal peer observations to those who do not. Throughout this study, more structure would have to be put in place to ensure that appropriate feedback and conversations take place after observations occur. Additionally,

conducting the analysis using both a qualitative and quantitative approach would be helpful to better understand the self-efficacy beliefs of each participant. Lastly, it would be beneficial to run an experimental study where one group of teachers are observed and receive no feedback, while another group of teachers are observed and do receive feedback. These results would assist in understanding why the current study found teachers who were observed to have lower self-efficacy levels.

Furthermore, it is recommended that future research study how teacher self-efficacy levels in all domains vary by the school level (elementary, middle, and high school) that teachers are assigned. This would allow for practitioners to further study the changes of instruction from different school levels and potentially make for a smoother transition between elementary, middle, and high school. Higher self-efficacy relates to teachers' perception of student ability. If elementary teachers have higher self-efficacy, could that be why elementary students seem to enjoy school more than middle school students? This is just one of the many questions that future researchers could explore.

Additionally, it is important to understand the school culture of teachers who are participating in peer observations. Does culture influence the quality of peer observations? Or, do peer observations influence the culture of the school? In other words, if a positive school culture exists, are teachers more likely to participate in peer observations and the pre- and post-conferences that can accompany them? These are just some of the questions that can be explored in future research. By understanding the culture of the school, researchers can get a better understanding of the impacts that it may have on peer observations and teacher self-efficacy. In fact, studying the relationship between school culture and teacher self-efficacy would be

beneficial as well. Perhaps, researchers could even control for school culture by using an ordinary least squares regression model.

Limitations

Conducting a secondary data analysis was very beneficial for this research. For example, there was no cost and the dataset underwent many checks and balances where the data was sent to a variety of committees to clean up any errors. However, it is also important to acknowledge the limitations that were presented throughout this study. For example, peer observations can be defined in a variety of ways and can take many different approaches. The TALIS questionnaire does not outline their definition when presenting teachers with questions related to peer observations. This means that a teacher could partake in instructional rounds with their school, but not think of it as a peer observation and therefore not check the box. Furthermore, teachers could participate in peer observations as part of a growth plan, where they are observed by a peer who is their department chair or team leader. This could mean that the teacher being observed may have a negative connotation with peer observations, which will impact their self-efficacy levels, therefore, impacting the results of this study. Overall, each participant is using their own understanding of peer observations when answering questions, rather than everyone using the same working definition, which, as research shows, should include conversations between peers outside of the observational setting.

Similarly, TALIS does not report the training that teachers had prior to participating in peer observations. If teachers are providing feedback to their peers, was any type of training provided to them to ensure quality and consistent feedback was provided? In addition, the survey does not ask teachers to report the timeframe or format of their observation. These observations

could be quick five to 15 minute walkthroughs or they could last entire 45 to 90 minutes class period. Understanding these observational characteristics would offer more insight and research possibilities.

Furthermore, additional teacher characteristics could have been studied throughout this research but they were not included in the dataset. For example, TALIS did not include participant responses to race. Also, TALIS did not include original responses to teacher age and only provided the data once they categorized it. Moreover, opening the survey up to grades K-12 would have allowed researchers to compare different school levels (elementary, middle, and high) to their study, providing more independent variables to be studied alongside teacher self-efficacy.

Lastly, the questionnaire used is a self-reported survey. One of the weaknesses of self-reporting is that participants may overestimate or underestimate their answers (Lesha, 2017). Further investigation and future research could do a mixed study to take into consideration a more qualitative approach.

Although there were limitations to this study, the TALIS questionnaire provided data that allowed the current research to be studied with a large population of participants, therefore, creating generalizability in grade seven, eight, and nine. Additionally, TALIS created questions in their survey specifically for the three domains of teacher self-efficacy (classroom management, instruction, student engagement) and included an overall score.

Researcher's Perspective

Early into my doctoral program, I was told by a professor that I should pursue an EdD degree instead of a PhD degree. That comment alone solidified my reasoning for entering this

Ph.D. journey. I am an educator, a practitioner, and a researcher, to name a few. I do not consider any of these titles to be mutually exclusive. In fact, when they are seen as separate roles, we are doing a disservice to teachers, students, and education as a whole. Often, research is seen as a foreign concept that has no practical implication. The language is difficult to understand, the tests do not make sense, and the papers are far too long to read in the little time that we have. Again, this is a misconception that must be addressed. Yes, the language can be difficult, the tests can be complex, and the papers can certainly be long. However, it is up to the researcher to captivate the minds of the readers by presenting a case so compelling that future research takes place and educators take the initiative to explore the practical application.

As an educator, and a newly appointed principal, I believe that we must always stay up to date on societal changes and the ever-changing landscape of education. We must also make decisions and lead implementations of strategies that are research and evidence based. This brings me to my current study. Self-efficacy is a belief that can change the way teachers and students see education, the world, and ultimately themselves. It is not a finite concept. It is a glimpse into an infinite mindset where we do not focus on winning and losing, but on playing the game, where excelling means we get to stay in the game.

This research will help me explore the importance of feedback and lead professional development with my administrative team on what makes quality, implementable feedback. Due to this research, I will be able to lead conversations about the importance of intentional and well defined peer observations, and take the time to develop an unobtrusive and trusting environment where emotional arousal is not causing negative impacts on efficacy levels.

Additionally, this research will inform the format and type of professional development that we use. Where teachers are in their career may inform what type of professional

development they need to experience positive outcomes. And, gathering organic qualitative data on what teachers need to feel efficacious in all domains, which may mean taking the time to explore how we engage students, is important. School is not solely based on academics and achievement levels, but on the overall teaching and learning experience.

I hope that this research is a step in the direction of closing the research and practitioner gap that has been in existence for far too long.

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Appendix A

TALIS Teacher Questionnaire:

https://drive.google.com/file/d/1rU7LK04Fh6t4qLQnGOH3soJydwhfqp-M/view?usp=sharing

Appendix B

Figure B1 – Classroom Management Teacher Self-Efficacy and Gender

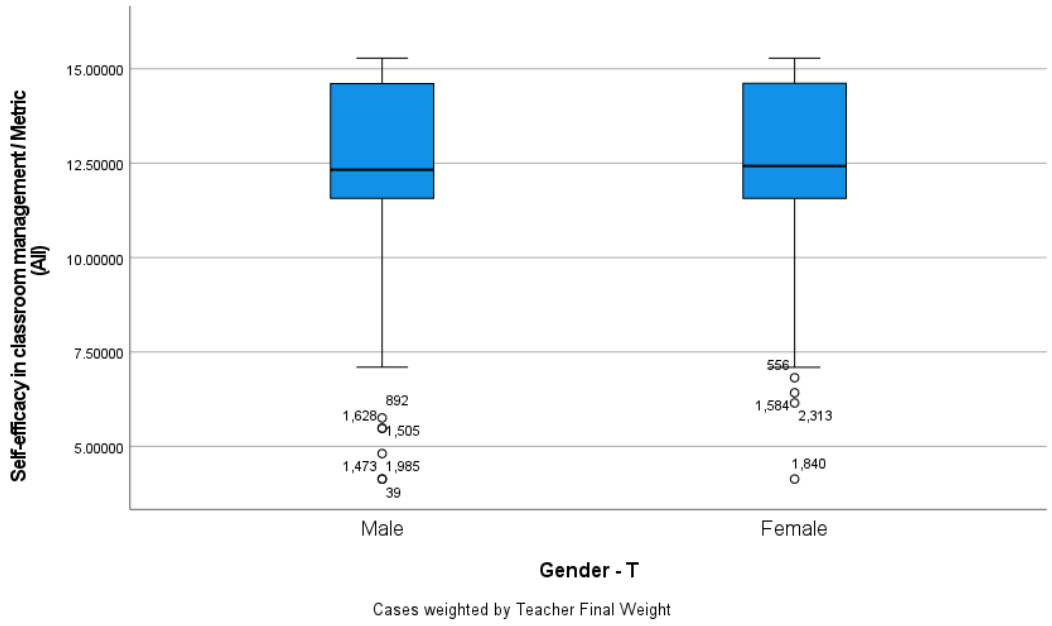

Figure B2 – Classroom Management Teacher Self-Efficacy and Age

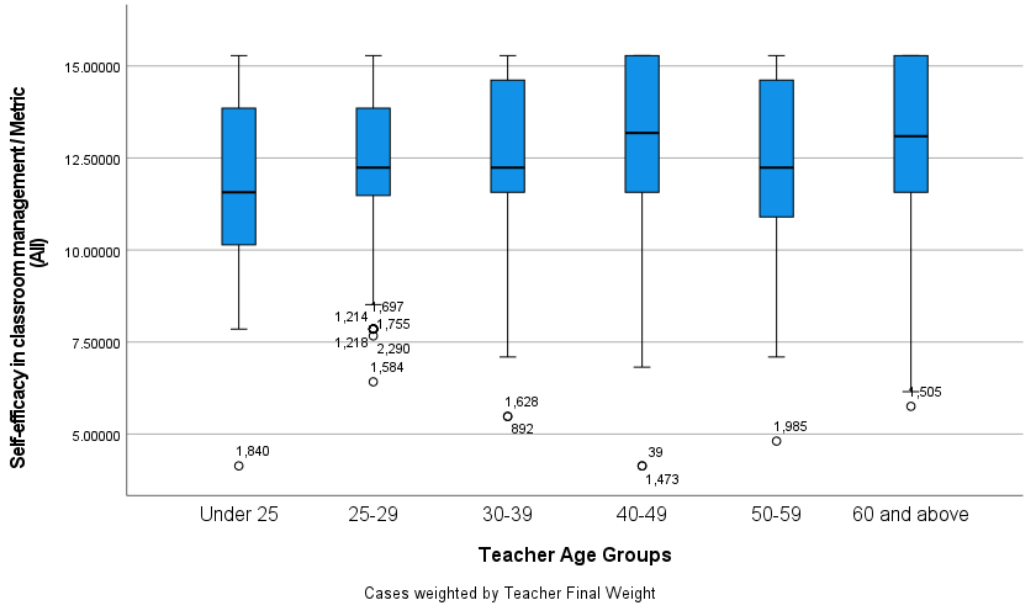

Figure B3 – Classroom Management Teacher Self-Efficacy and Years of Teaching Experience

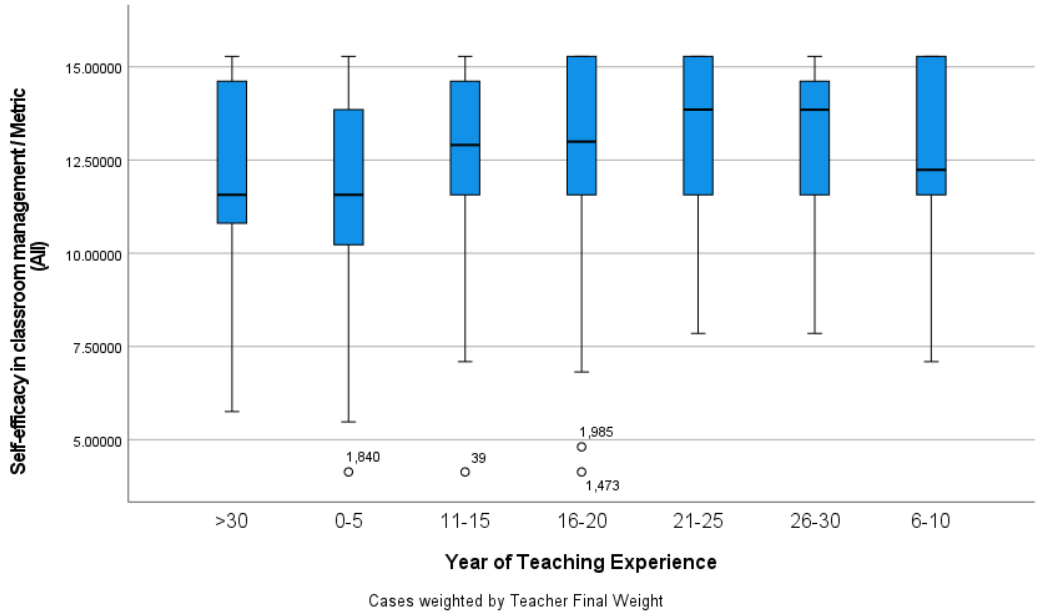

Figure B4 – Instruction Teacher Self-Efficacy and Gender

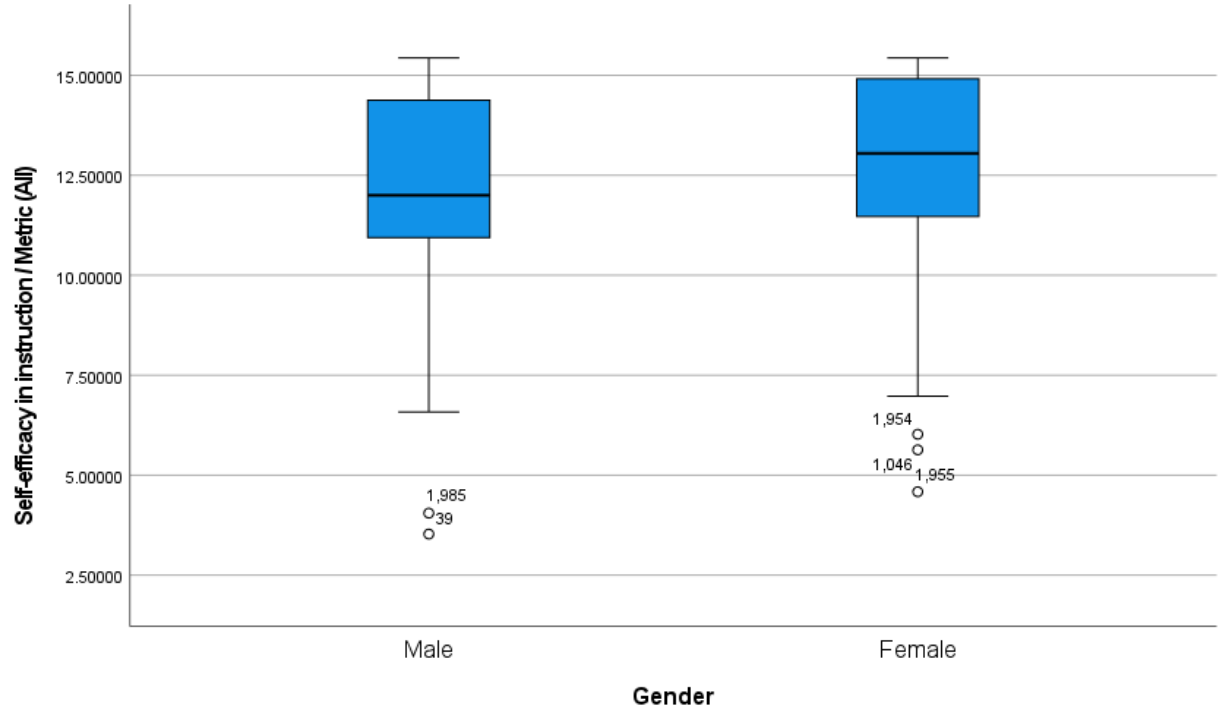

Figure B5 – Instruction Teacher Self-Efficacy and Age

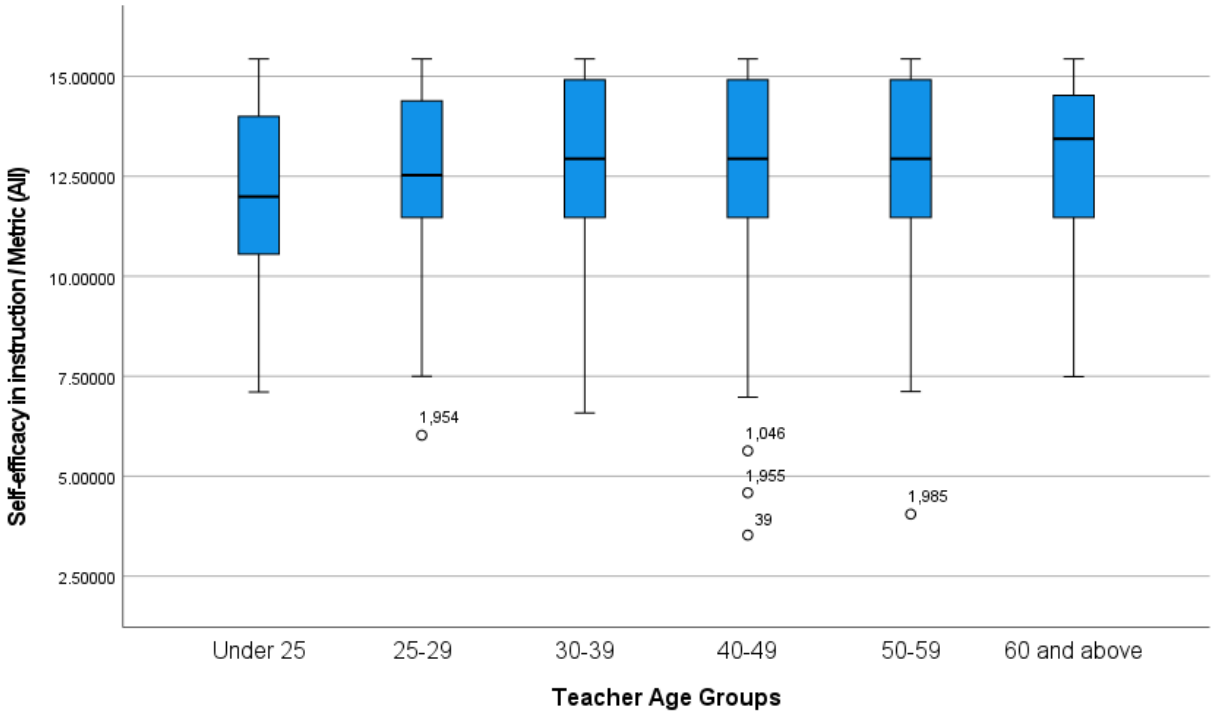

Figure B6 – Instruction Teacher Self-Efficacy and Years of Teaching Experience

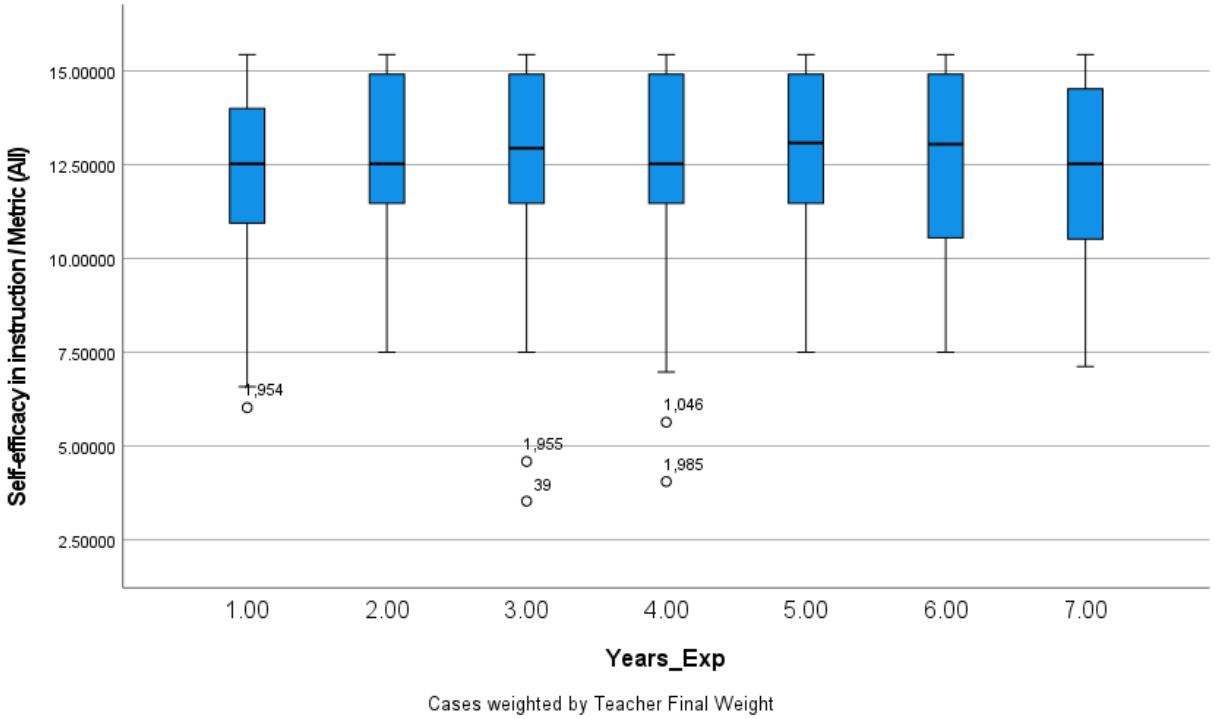

Figure B7 – Student Management Teacher Self-Efficacy and Gender

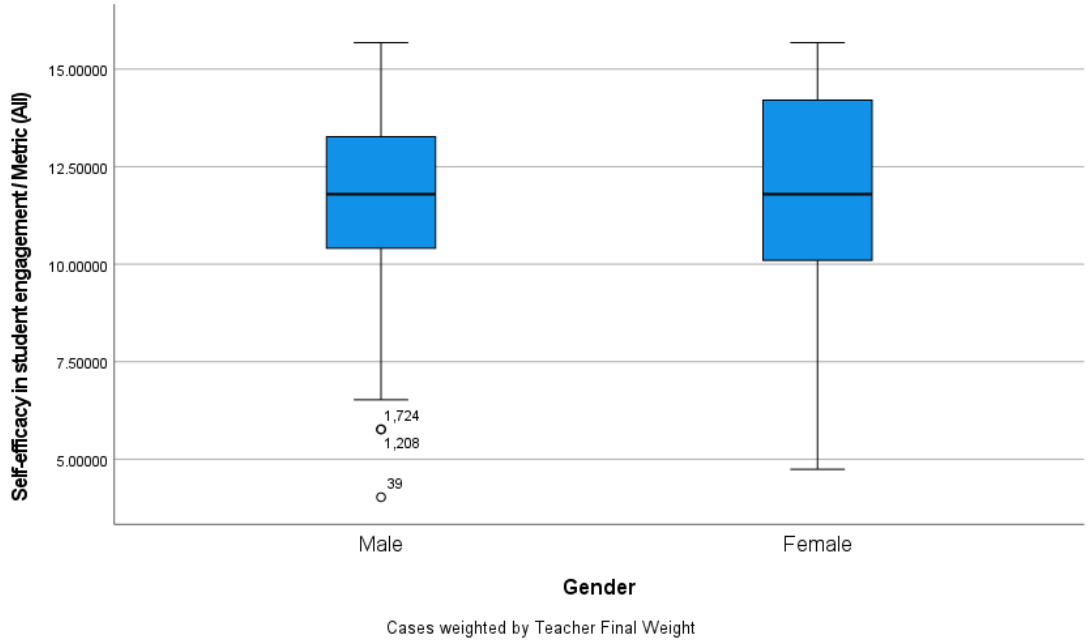

Figure B8 – Student Management Teacher Self-Efficacy and Age

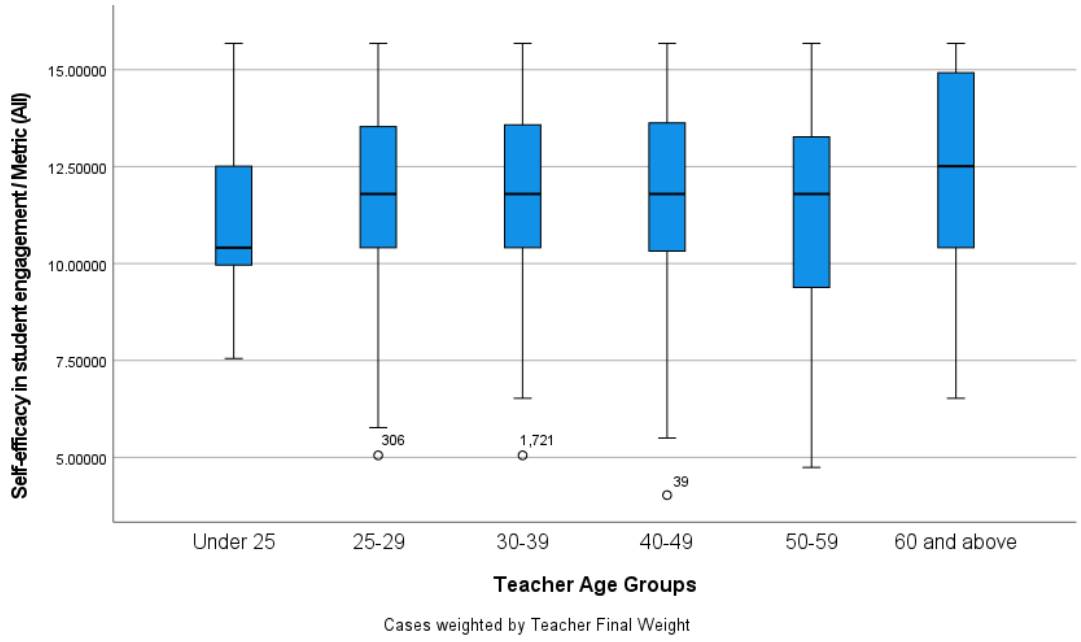

Figure B9 – Student Engagement Teacher Self-Efficacy and Years of Teaching Experience

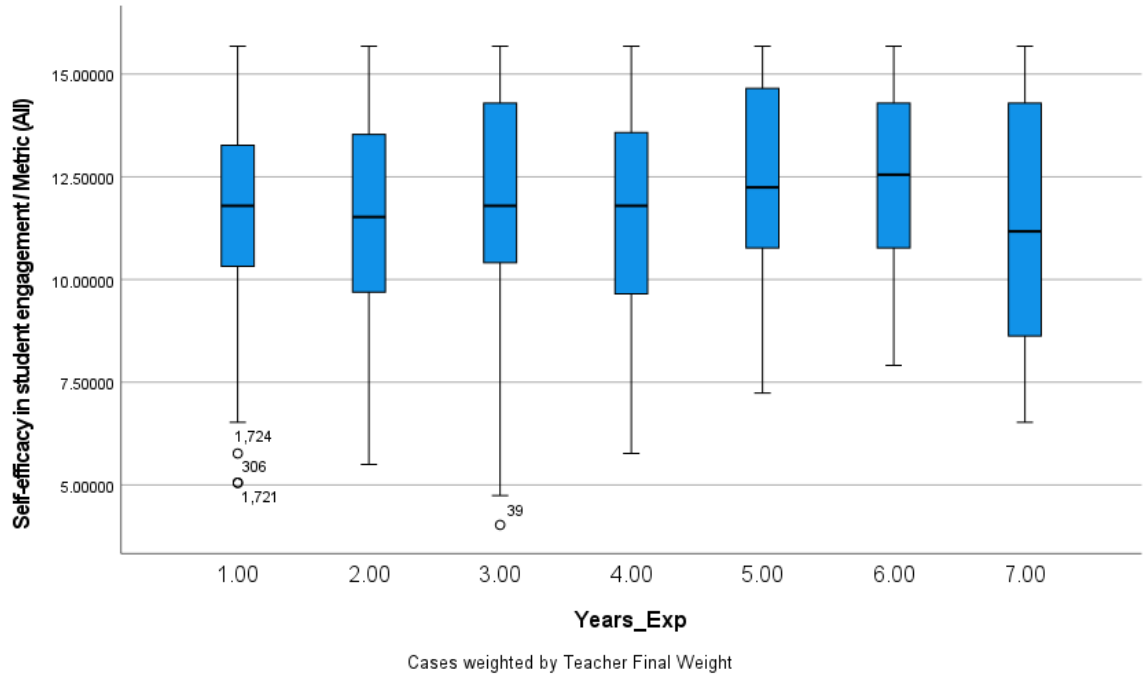

Figure B10 – Overall Teacher Self-Efficacy and Gender

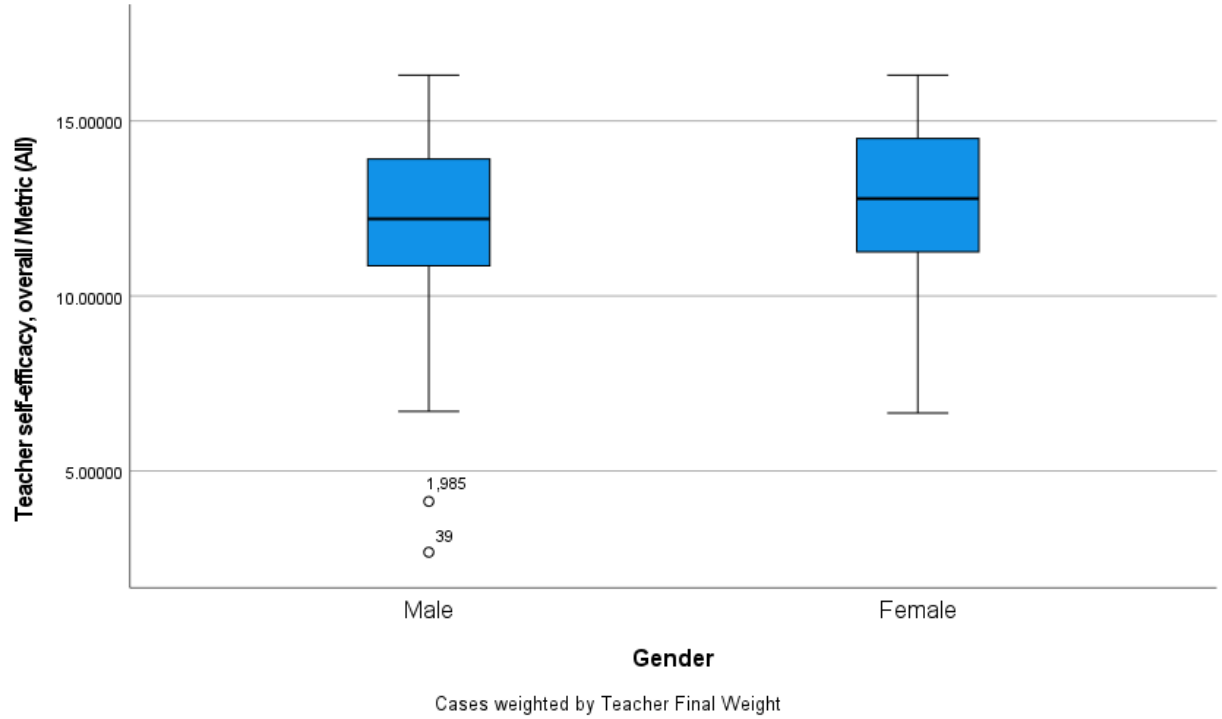

Figure B11 – Overall Teacher Self-Efficacy and Age

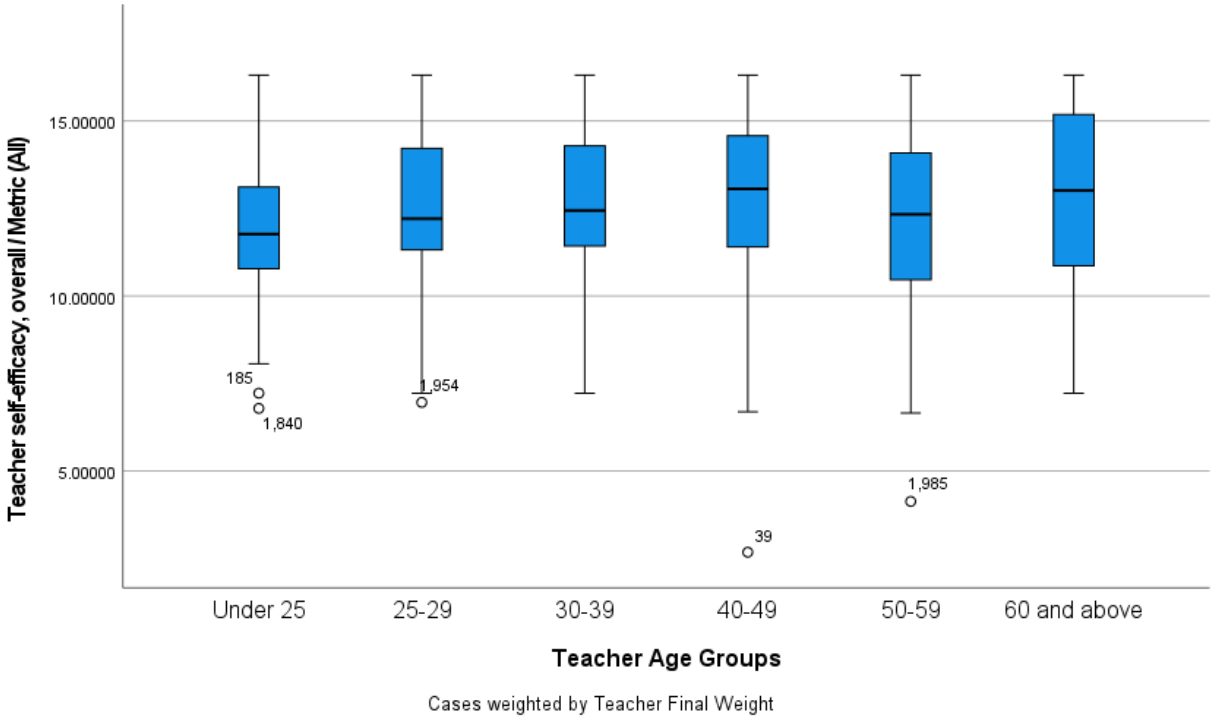

Figure B12 – Overall Teacher Self-Efficacy and Years of Teaching Experience

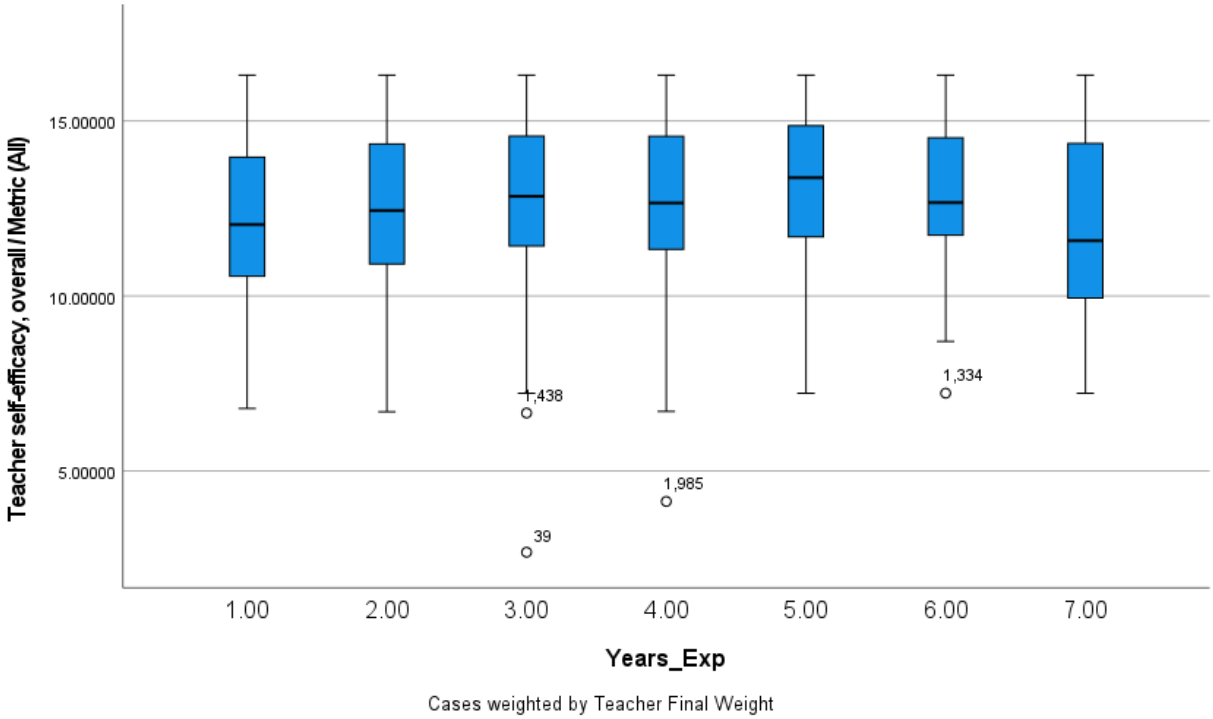

Figure B13 – Classroom Management Teacher Self-Efficacy and Peer Observation Observer

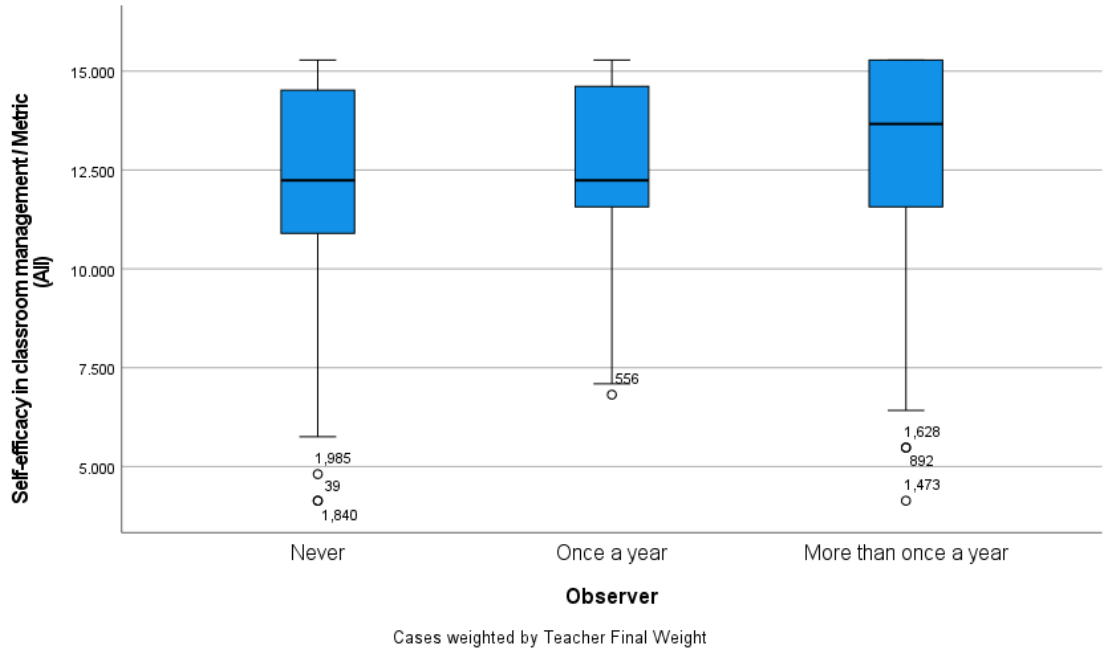

Figure B14 – Instruction Teacher Self-Efficacy and Peer Observation Observer

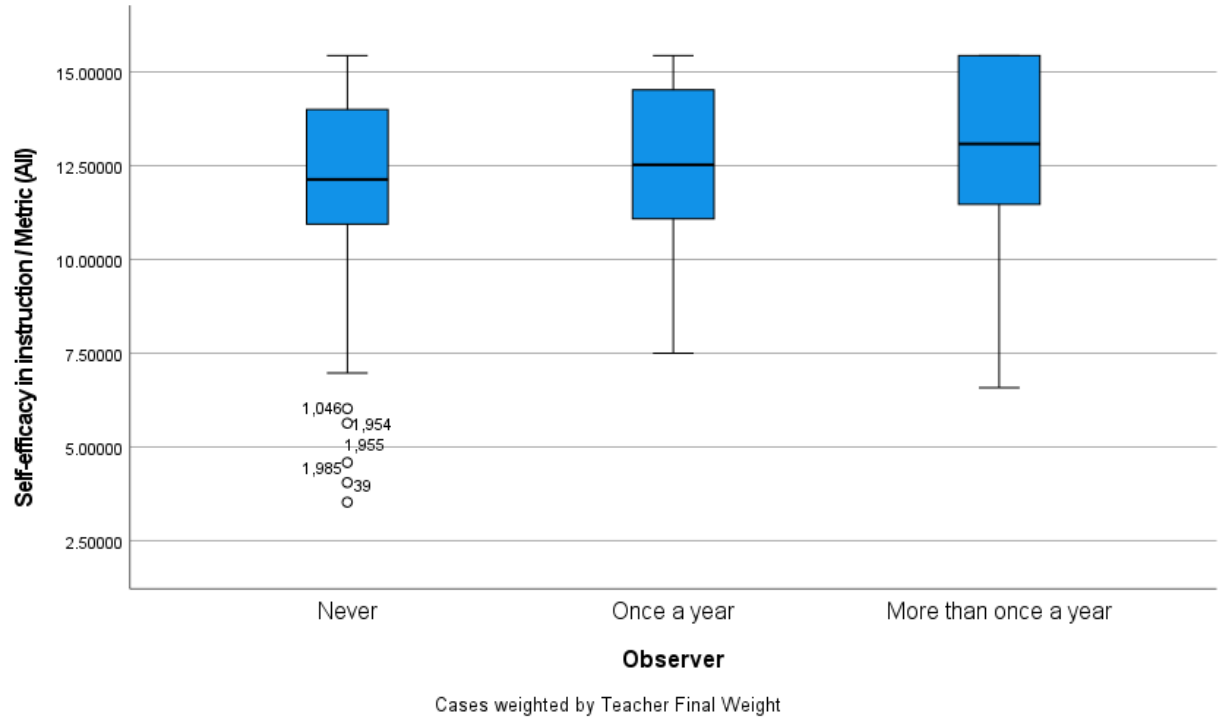

Figure B15 – Student Engagement Teacher Self-Efficacy and Peer Observation Observer

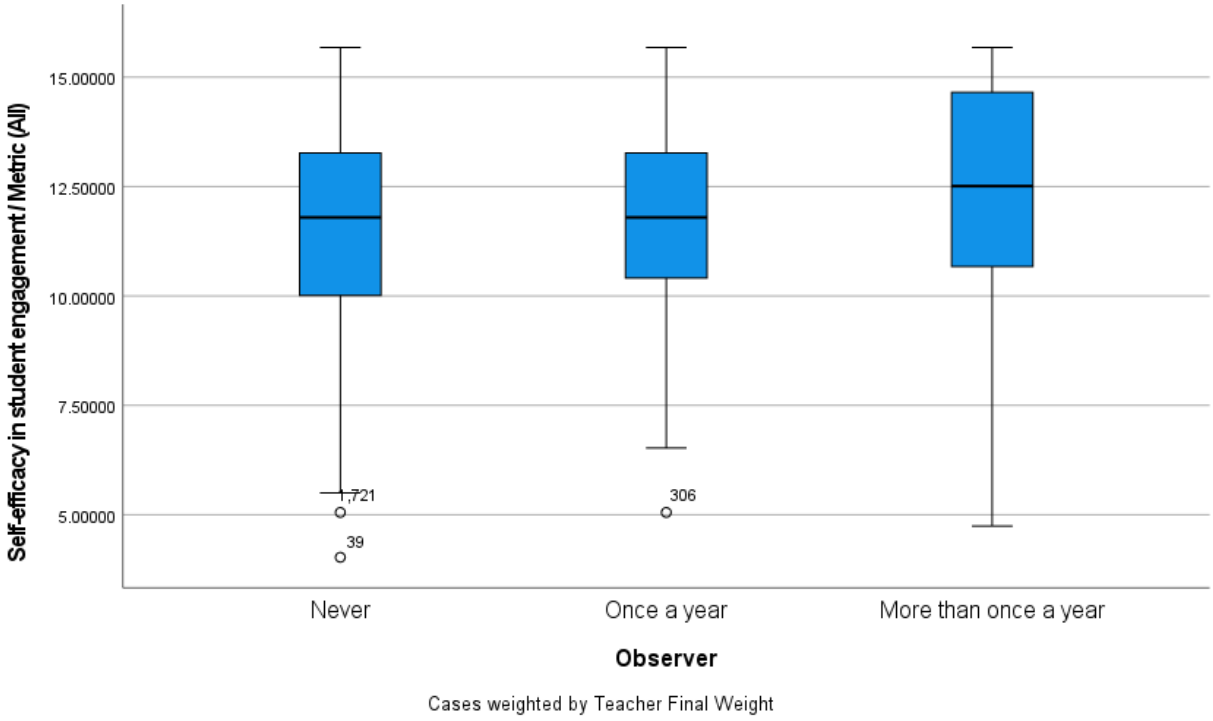

Figure B16 – Overall Teacher Self-Efficacy and Peer Observation Observer

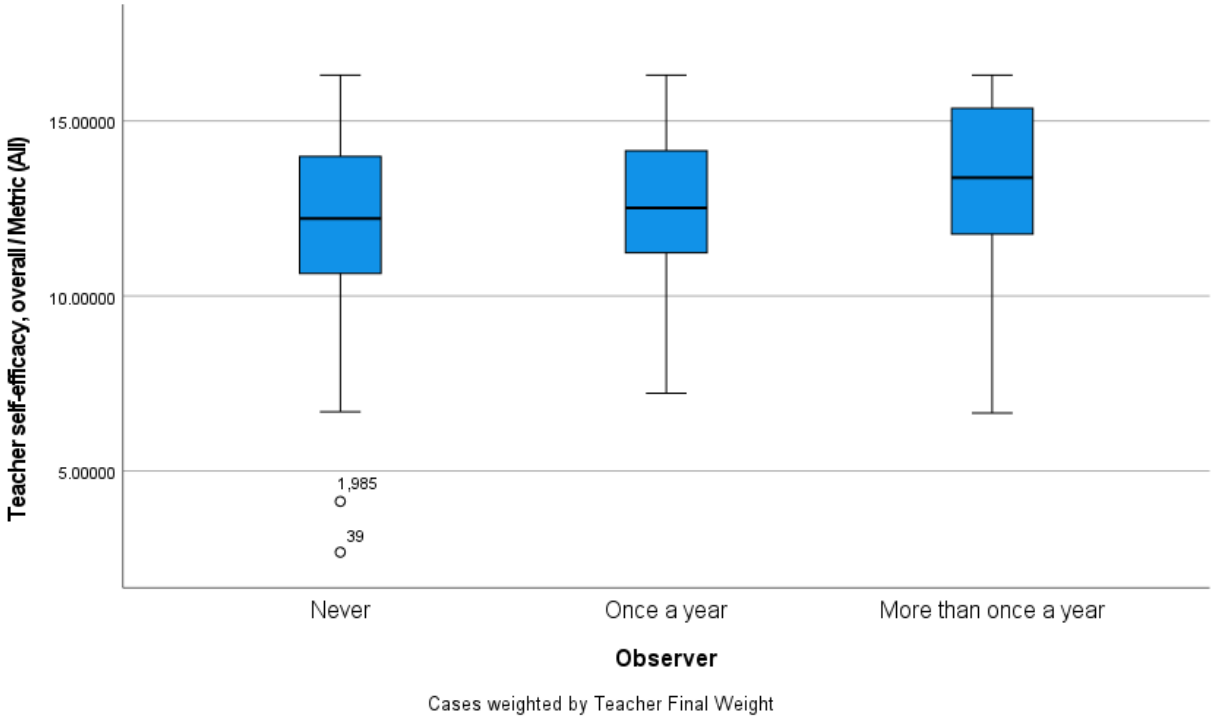

Figure B17 – Classroom Management Teacher Self-Efficacy and Peer Observation as the Observed

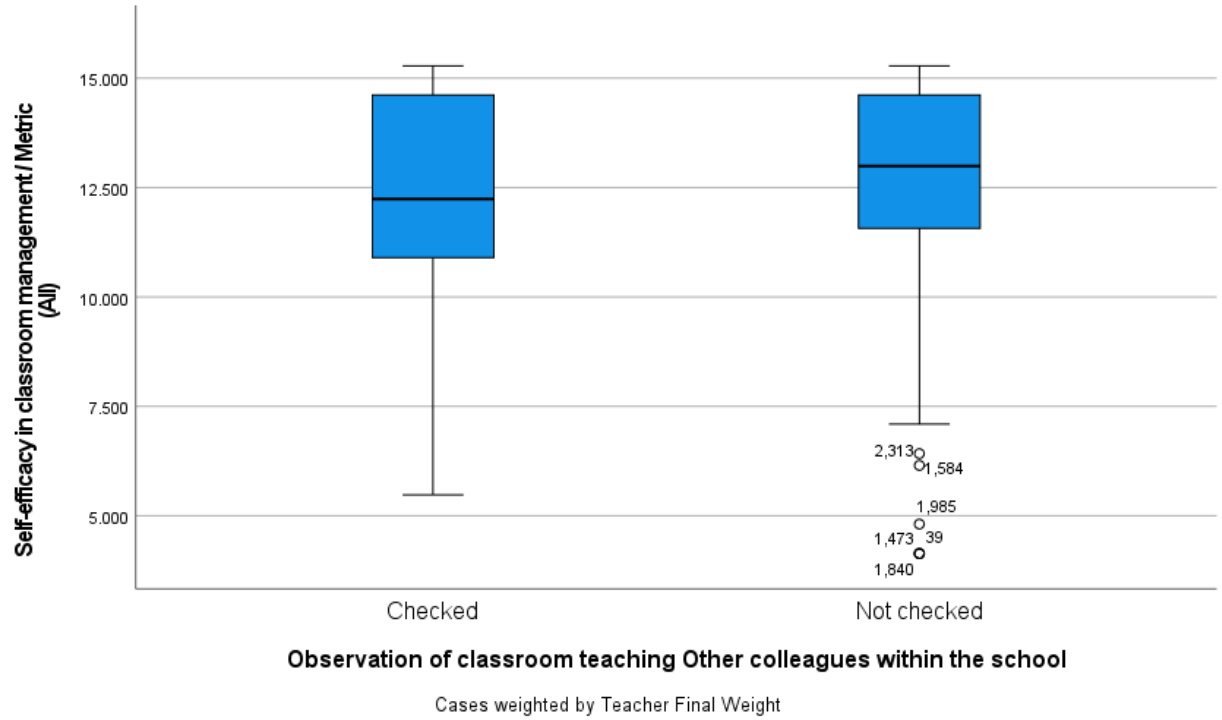

Figure B18 – Instruction Teacher Self-Efficacy and Peer Observation as Observed

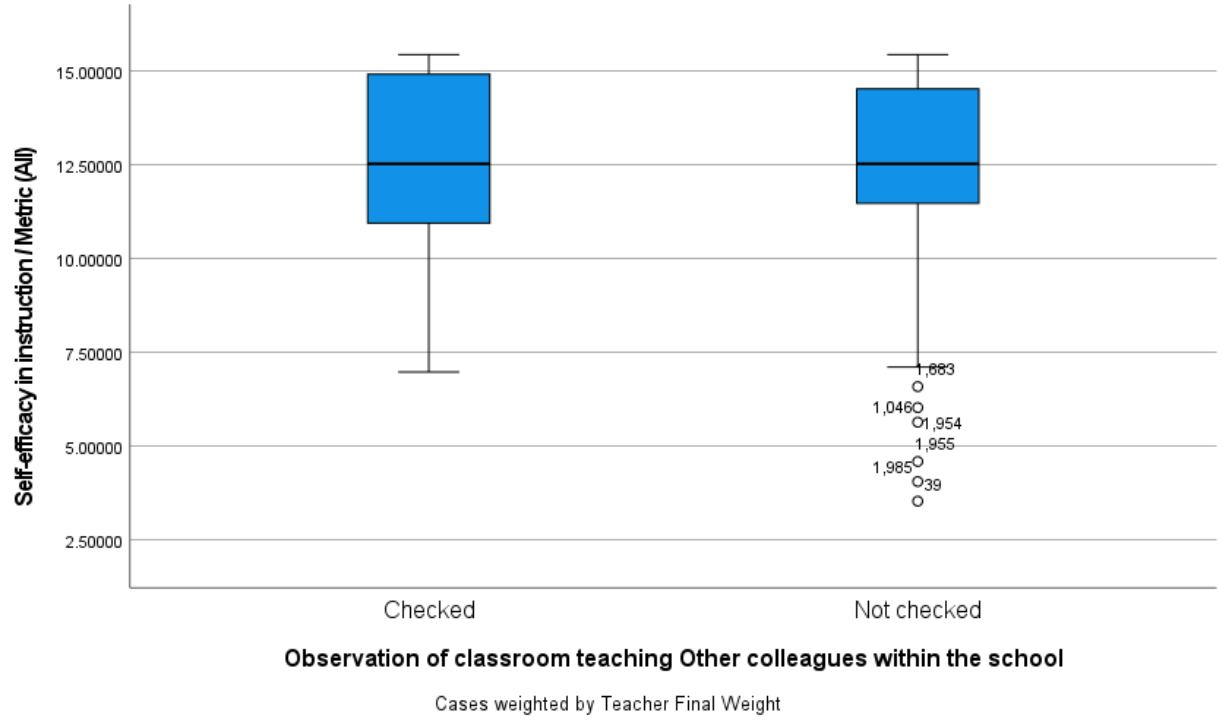

Figure B19 – Student Engagement Teacher Self-Efficacy and Peer Observation as the Observed

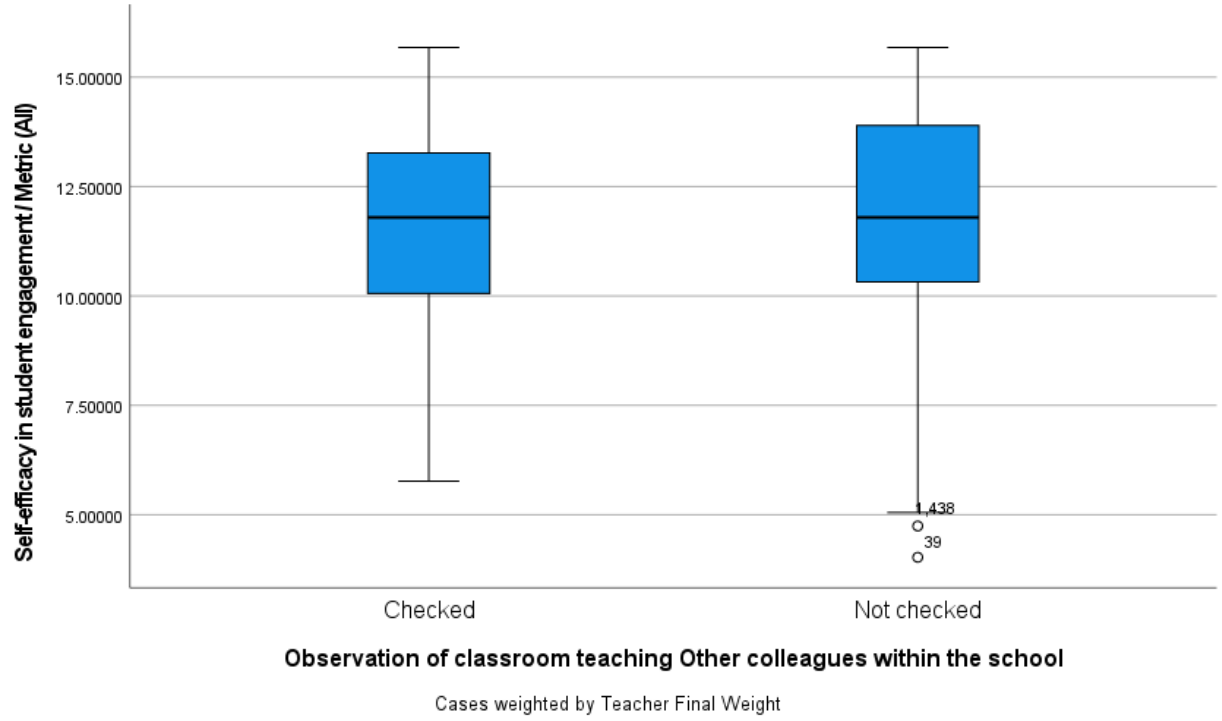

Figure B20 – Overall Teacher Self-Efficacy and Peer Observation as the Observed

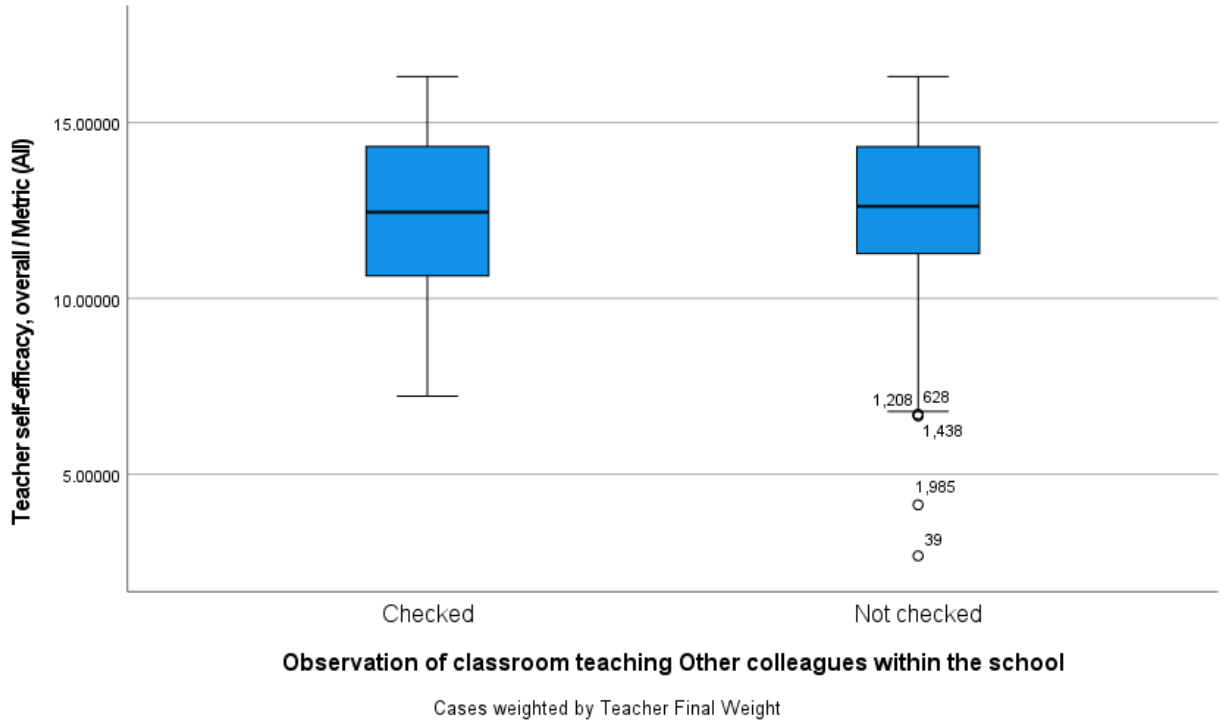

Figure B21 – Classroom Management Teacher Self-Efficacy

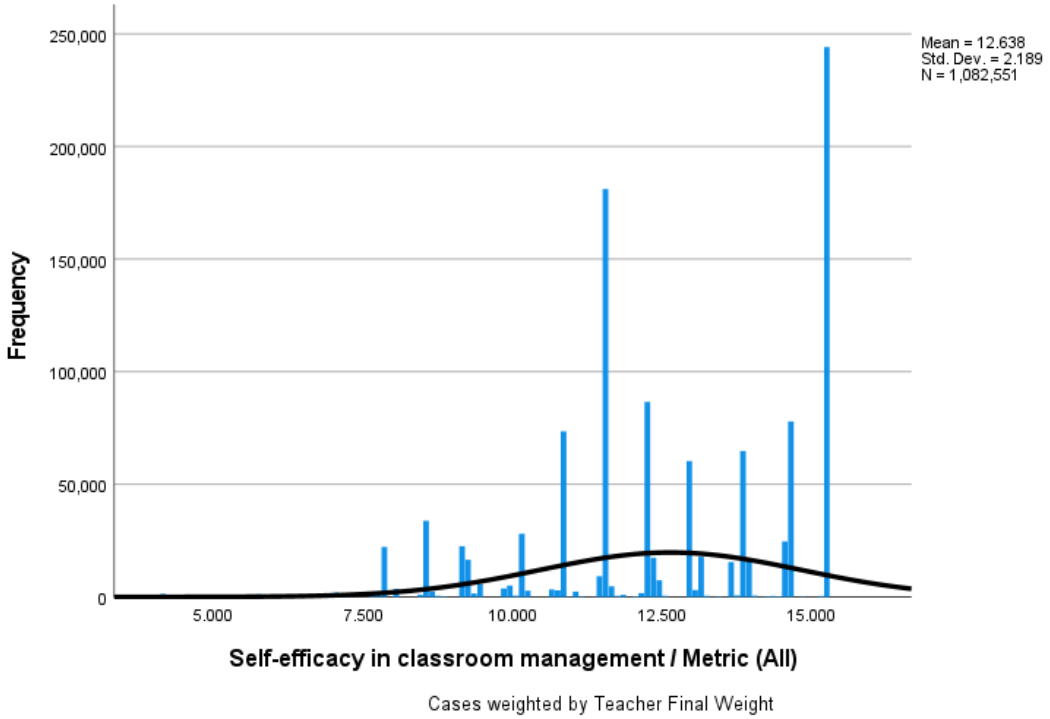

Figure B22 – Instruction Teacher Self-Efficacy

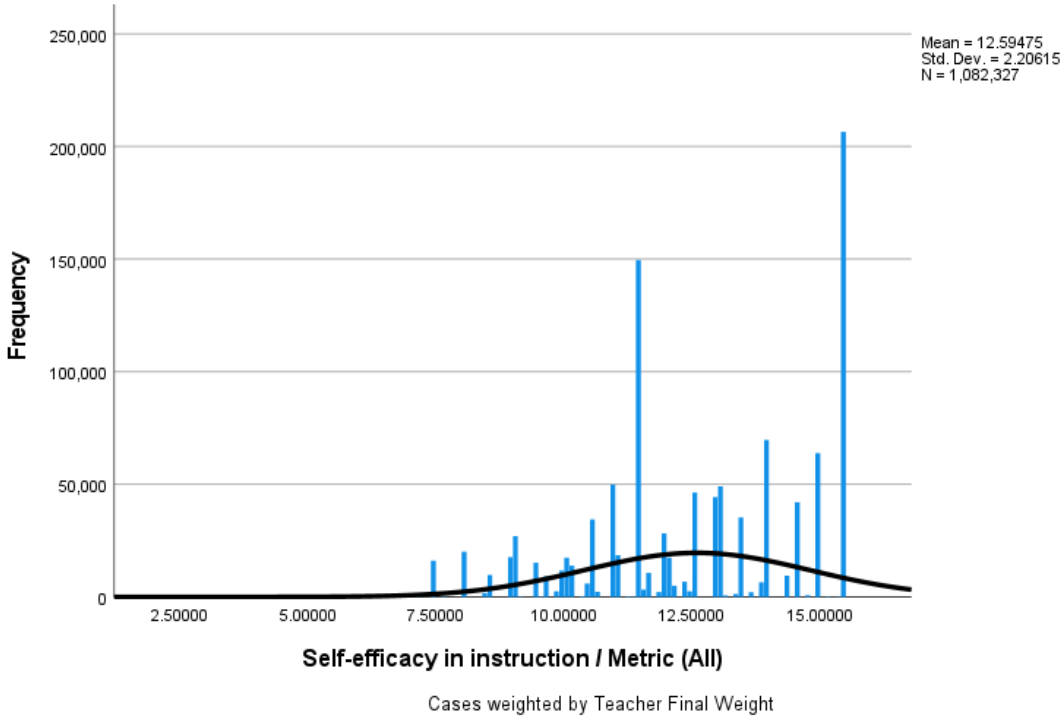

Figure B23 – Student Engagement Teacher Self-Efficacy

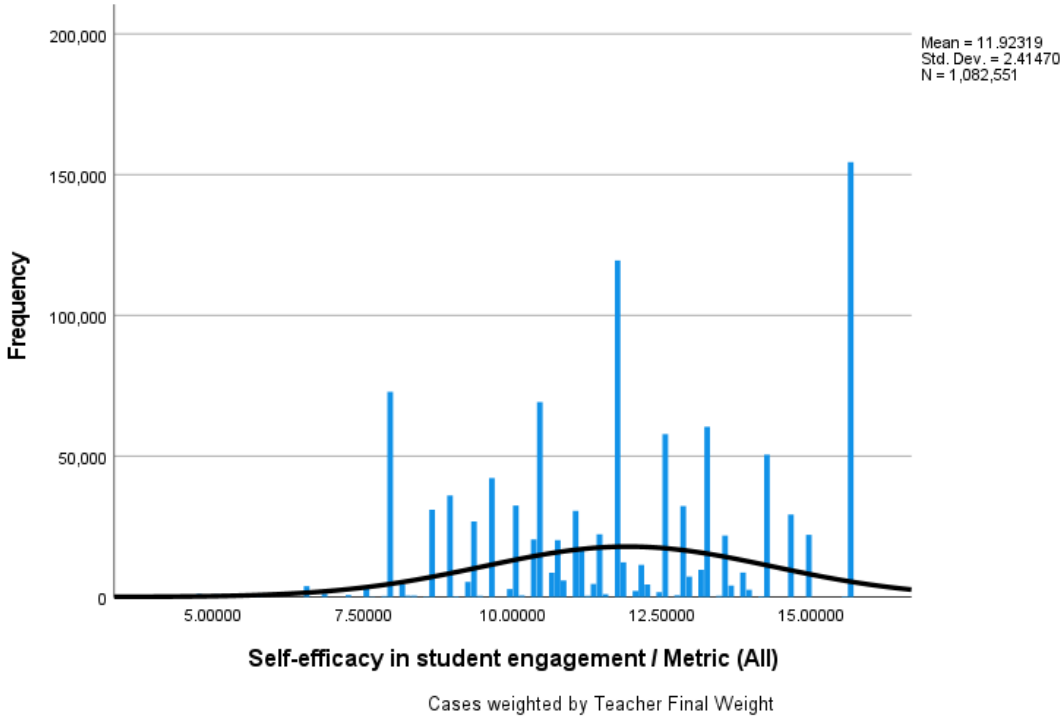

Figure B24 – Overall Teacher Self-Efficacy

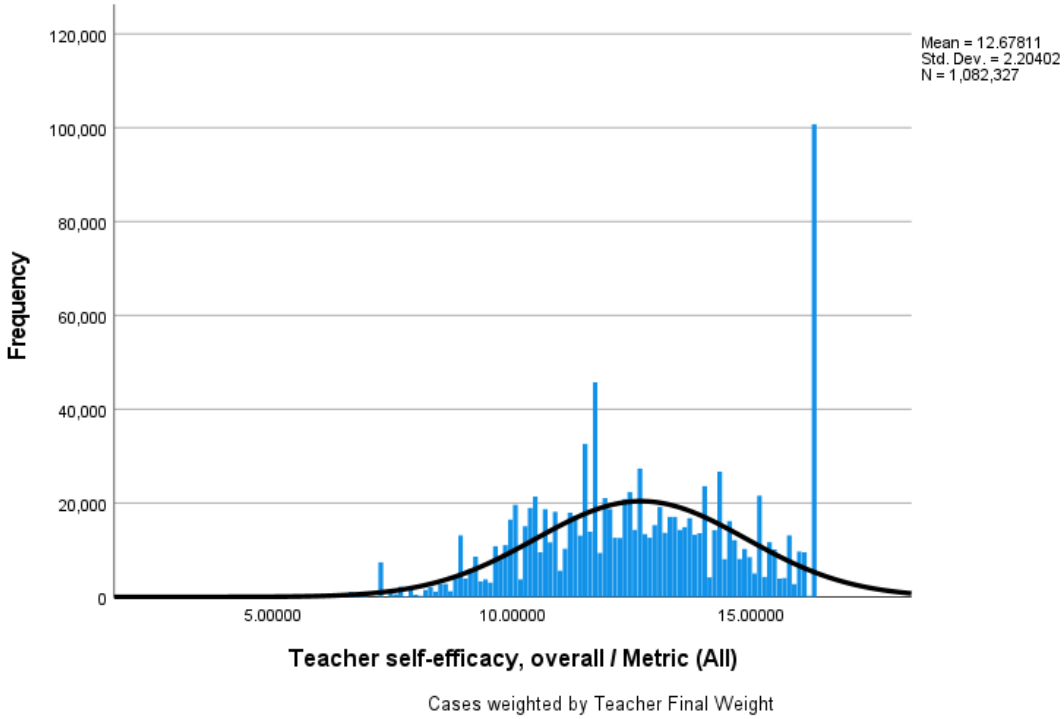

Table B1 – Classroom Management Self-Efficacy and Age

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Under 25	31351	11.80	2.45	.014	11.78	11.83	4.14	15.28
25 – 29	99333	12.36	2.11	.007	12.34	12.37	6.42	15.28
30 – 39	286865	12.63	2.11	.004	12.63	12.64	5.48	15.28
40 – 49	312184	13.04	2.10	.004	13.04	13.05	4.14	15.28
50 – 59	258284	12.33	2.25	.004	12.32	12.34	4.81	15.28
60 and above	80647	12.77	2.28	.008	12.75	12.78	5.75	15.28
Total	1068664	12.64	2.19	.002	12.64	12.64	4.14	15.28

Table B2 – Games-Howell Post-Hoc – Classroom Management Teacher Self-Efficacy and Age

						95% CI	
	(I) Teacher Age Group	(J) Teacher Age Group	Mean difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
Games-Howell	Under 25	25 – 29	-.556	.015	.000	-.600	-.512
		30 – 39	-.830	.014	.000	-.871	-.789
		40 – 49	-1.239	.014	.000	-1.280	-1.198
		50 – 59	-.525	.015	.000	-.567	-.484
		60 and above	-.964	.016	.000	-1.010	-.919
	25 – 29	Under 25	.556	.015	.000	.512	.600
		30 – 39	-.273	.008	.000	-.296	-.251
		40 – 49	-.682	.008	.000	-.704	-.661
		50 – 59	.031	.008	.002	.008	.054
		60 and above	-.408	.010	.000	-.438	-.378
	30 – 39	Under 25	.830	.014	.000	.789	.871
		25 – 29	.274	.008	.000	.251	.296
		40 – 49	-.409	.005	.000	-.424	-.393
		50 – 59	.305	.006	.000	.288	.321
		60 and above	-.134	.009	.000	-.160	-.109
	40 – 49	Under 25	1.239	.014	.000	1.198	1.280
		25 – 29	.682	.008	.000	.661	.704
		30 – 39	.409	.005	.000	.393	.424
		50 – 59	.714	.006	.000	.697	.730
		60 and above	.275	.009	.000	.249	.300
	50 – 59	Under 25	.525	.015	.000	.484	.567
		25 – 29	.682	.008	.002	-.054	-.008
		30 – 39	-.305	.006	.000	-.321	-.288
		40 – 49	-.714	.006	.000	-.730	-.697
		60 and above	-.439	.009	.000	-.465	-.413
	60 and above	Under 25	.964	.016	.000	.919	1.010
		25 – 29	.408	.010	.000	.378	.438
		30 – 39	.134	.009	.000	.109	.160
		40 – 49	-.275	.009	.000	-.300	-.250
		50 – 59	.439	.009	.000	.413	.465

*The mean difference is significant at the .05 level

Table B3 – One-Way ANOVA Descriptive Statistics - Classroom Management Teacher Self-Efficacy and Years of Experience

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
0 – 5	561	12.112	2.2807	.096	11.923	12.301	4.137	15.282
6 – 10	426	12.813	2.056	.100	12.617	13.009	7.094	15.282
11 – 15	448	12.947	2.028	.096	12.759	13.135	4.137	15.282
16 – 20	421	13.000	2.154	.105	12.793	13.206	4.137	15.282
21 – 25	260	13.126	2.003	.124	12.881	13.370	7.853	15.282
26 – 30	170	13.223	1.864	.143	12.941	13.505	7.853	15.282
More than 30	140	12.673	2.340	.198	12.282	13.064	5.755	15.282
Total	2426	12.762	2.152	.044	12.676	12.848	4.137	15.282

Table B4 – Games-Howell Post-Hoc – Classroom Management Teacher Self-Efficacy and Years of Experience

						95% CI	
	(I) Experience as a Teacher	(J) Experience as a Teacher	Mean difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
Games-Howell	0 – 5	6 – 10	-.714*	.007	.000	-.734	-.695
		11 – 15	-.820*	.006	.000	-.839	-.801
		16 – 20	-.920*	.007	.000	-.940	-.900
		21 – 25	-1.158*	.007	.000	-1.180	-1.136
		26 – 30	-1.017*	.009	.000	-1.043	-.992
		More than 30	-.091*	.010	.000	-.119	-.062
	6 – 10	0 – 5	.714*	.007	.000	.695	.734
		11 – 15	-.105*	.007	.000	-.125	-.086
		16 – 20	-.206*	.007	.000	-.226	-.185
		21 – 25	-.444*	.008	.000	-.466	-.421
		26 – 30	-.303*	.009	.000	-.329	-.278
		More than 30	.624*	.010	.000	.595	.652
	11 – 15	0 – 5	.820*	.006	.000	.801	.839
		6 – 10	.105*	.007	.000	.086	.125
		16 – 20	-.100*	.007	.000	-.121	-.080
		21 – 25	-.338*	.007	.000	-.360	-.316
		26 – 30	-.198*	.009	.000	-.223	-.172
		More than 30	.729*	.010	.000	.701	.757
	16 – 20	0 – 5	.920*	.007	.000	.900	.940
		6 – 10	.206*	.007	.000	.185	.226
		11 – 15	.100*	.007	.000	.080	.121
		21 – 25	-.238*	.008	.000	-.261	-.215
		26 – 30	-.097*	.009	.000	-.124	-.071
		More than 30	.830*	.010	.000	.800	.859
	21 – 25	0 – 5	1.158*	.007	.000	1.136	1.180
		6 – 10	.444*	.008	.000	.421	.466
		11 – 15	.338*	.007	.000	.316	.360
		16 – 20	.238*	.008	.000	.215	.261
		26 – 30	.140*	.009	.000	.113	.168
		More than 30	1.067*	.010	.000	1.037	1.097
	26 – 30	0 – 5	1.017*	.009	.000	.992	1.043
		6 – 10	.303*	.009	.000	.278	.329
		11 – 15	.198*	.009	.000	.172	.223
		16 – 20	.097*	.009	.000	.071	.124
		21 – 25	-.140*	.009	.000	-.168	-.113
		More than 30	.927*	.011	.000	.894	.960
	More than 30	0 – 5	.091*	.010	.000	.062	.119

6 – 10	-.624*	.010	.000	-.652	-.595
11 – 15	-.729*	.010	.000	-.757	-.701
16 – 20	-.830*	.010	.000	-.859	-.800
21 – 25	-1.067*	.010	.000	-1.097	-1.037
26 – 30	-.927*	.011	.000	-.960	-.894

Table B5 – One-way ANOVA Descriptive Statistics – Instruction Teacher Self-Efficacy and Age

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Under 25	31351	12.326	2.2181	.0125	12.301	12.350	7.107	15.439
25 – 29	99333	12.496	2.1135	.0067	12.483	12.509	6.025	15.439
30 – 39	286865	12.627	2.1564	.0040	12.619	12.635	6.584	15.439
40 – 49	312184	12.774	2.1745	.0039	12.766	12.781	3.530	15.439
50 – 59	258059	12.413	2.2141	.0044	12.404	12.421	4.053	15.439
60 and above	80647	12.518	2.4999	.0088	12.501	12.535	7.490	15.439
Total	1068440	12.589	2.2060	.0021	12.585	12.593	3.530	15.439

Table B6 - Games-Howell Post-Hoc – Instruction Teacher Self-Efficacy and Age

						95% CI	
	(I) Teacher Age Group	(J) Teacher Age Group	Mean difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
Games-Howell	Under 25	25 – 29	-.170*	.014	.000	-.211	-.130
		30 – 39	-.301*	.013	.000	-.339	-.264
		40 – 49	-.448*	.013	.000	-.485	-.410
		50 – 59	-.087*	.013	.000	-.125	-.049
		60 and above	-.192*	.015	.000	-.236	-.148
	25 – 29	Under 25	.170*	.014	.000	.130	.211
		30 – 39	-.131*	.008	.000	-.153	-.109
		40 – 49	-.278*	.008	.000	-.300	-.256
		50 – 59	.083*	.008	.000	.060	.106
		60 and above	-.022	.011	.000	-.053	.010
	30 – 39	Under 25	.301*	.013	.000	.264	.339
		25 – 29	.131*	.008	.000	.109	.153
		40 – 49	-.147*	.006	.000	-.163	-.131
		50 – 59	.214*	.006	.000	.197	.231
		60 and above	.109*	.010	.000	.082	.137
	40 – 49	Under 25	.448*	.013	.000	.410	.485
		25 – 29	.278*	.008	.000	.256	.300
		30 – 39	.147*	.006	.000	.131	.163
		50 – 59	.361*	.006	.000	.344	.377
		60 and above	.256*	.010	.000	.229	.283
	50 – 59	Under 25	.087*	.013	.000	.049	.125
		25 – 29	-.083*	.008	.000	-.106	-.060
		30 – 39	-.214*	.006	.000	-.231	-.197
		40 – 49	-.361*	.006	.000	-.377	-.344
		60 and above	-.105*	.010	.000	-.133	-.077
	60 and above	Under 25	.192*	.015	.000	.148	.236

25 – 29	.022	.011	.000	-.010	.053
30 – 39	-.109*	.010	.000	-.137	-.082
40 – 49	-.256*	.010	.000	-.283	-.229
50 – 59	.105*	.010	.000	.077	.133

*The mean difference is significant at the .05 level

Table B7 - One-way ANOVA Descriptive Statistics – Instruction Teacher Self-Efficacy and Years of Experience

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
0 – 5	263849	12.281	2.1497	.0042	12.272	12.289	6.0	15.4
6 – 10	185302	12.700	2.0432	.0047	12.691	12.709	7.5	15.4
11 – 15	185358	12.878	2.1357	.0050	12.868	12.888	3.5	15.4
16 – 20	166696	12.608	2.2565	.0055	12.597	12.618	4.1	15.4
21 – 25	117805	12.996	2.1193	.0062	12.984	13.008	7.5	15.4
26 – 30	79173	12.662	2.2107	.0079	12.647	12.678	7.5	15.4
More than 30	84144	12.073	2.6241	.0090	12.056	12.091	7.1	15.4
Total	1082327	12.595	2.2061	.0021	12.591	12.599	3.5	15.4

Table B8 - Games-Howell Post-Hoc – Instruction Teacher Self-Efficacy and Years of Experience

						95% CI	
	(I) Years of Experience	(J) Years of Experience	Mean difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
Games-Howell	0 – 5	6 – 10	-.419*	.006	.000	-.44	-.40
		11 – 15	-.597*	.006	.000	-.62	-.58
		16 – 20	-.327*	.007	.000	-.35	-.31
		21 – 25	-.715*	.007	.000	-.74	-.69
		26 – 30	-.382*	.009	.000	-.41	-.36
		More than 30	.207*	.010	.000	.18	.24
	6 – 10	0 – 5	.419*	.006	.000	.40	.44
		11 – 15	-.178*	.007	.000	-.20	-.16
		16 – 20	.093*	.007	.000	.07	.11
		21 – 25	-.296*	.008	.000	-.32	-.27
		26 – 30	.038*	.009	.000	.01	.06
		More than 30	.627*	.010	.000	.60	.66
	11 – 15	0 – 5	.597*	.006	.000	.58	.62
		6 – 10	.178*	.007	.000	.16	.20
		16 – 20	.270*	.007	.000	.25	.29
		21 – 25	-.118*	.008	.000	-.14	-.09
		26 – 30	.216*	.009	.000	.19	.24
		More than 30	.804*	.010	.000	.77	.83
	16 – 20	0 – 5	.327*	.007	.000	.31	.35
		6 – 10	-.093*	.007	.000	-.11	-.07
		11 – 15	-.270*	.007	.000	-.29	-.25
		21 – 25	-.388*	.008	.000	-.41	-.36
		26 – 30	-.055*	.010	.000	-.08	-.03
		More than 30	.534*	.011	.000	.50	.57
	21 – 25	0 – 5	.715*	.007	.000	.69	.74
		6 – 10	.296*	.008	.000	.27	.32
		11 – 15	.118*	.008	.000	.09	.14
		16 – 20	.388*	.008	.000	.36	.41
		26 – 30	.333*	.010	.000	.30	.36
		More than 30	.922*	.011	.000	.89	.95
	26 – 30	0 – 5	.382*	.009	.000	.36	.41
		6 – 10	-.038*	.009	.000	-.06	-.01
		11 – 15	-.216*	.009	.000	-.24	-.19
		16 – 20	.055*	.010	.000	.03	.08
		21 – 25	-.333*	.010	.000	-.36	-.30
		More than 30	.589*	.012	.000	.55	.62

More than 30	0 – 5	-.207*	.010	.000	-.24	-.18
	6 – 10	-.627*	.010	.000	-.66	-.60
	11 – 15	-.804*	.010	.000	-.83	-.77
	16 – 20	-.534*	.011	.000	-.57	-.50
	21 – 25	-.922*	.011	.000	-.95	-.89
	26 – 30	-.589*	.012	.000	-.62	-.55

Table B9 – One-way ANOVA Descriptive Statistics – Student Engagement Self-Efficacy and Age

					95% Confidence Interval for Mean			
	N	Mean	Std. Deviation	Std. Error	Lower Bound	Upper Bound	Minimum	Maximum
Under 25	31351	12.326	2.2181	.0125	12.301	12.350	7.107	15.439
25 – 29	99333	12.496	2.1135	.0067	12.483	12.509	6.025	15.439
30 – 39	286865	12.627	2.1564	.0040	12.619	12.635	6.584	15.439
40 – 49	312184	12.774	2.1745	.0039	12.766	12.781	3.530	15.439
50 – 59	258059	12.413	2.2141	.0044	12.404	12.421	4.053	15.439
60 and above	80647	12.518	2.4999	.0088	12.501	12.535	7.490	15.439
Total	1068440	12.589	2.2060	.0021	12.585	12.593	3.530	15.439

Table B10 – Games-Howell Post-Hoc – Student Engagement Self-Efficacy and Age

						95% CI	
	(I) Teacher Age Group	(J) Teacher Age Group	Mean difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
Games-Howell	Under 25	25 – 29	-.846*	.014	.000	-.886	-.807
		30 – 39	-.969*	.012	.000	-1.005	-.934
		40 – 49	-.895*	.012	.000	-.930	-.859
		50 – 59	-.516*	.013	.000	-.552	-.480
		60 and above	-1.433*	.014	.000	-1.474	-1.392
	25 – 29	Under 25	.846*	.014	.000	.807	.886
		30 – 39	-.123*	.009	.000	-.147	-.098
		40 – 49	-.049*	.009	.000	-.073	-.024
		50 – 59	.330*	.009	.000	.304	.356
		60 and above	-.587*	.011	.000	-.619	-.555
	30 – 39	Under 25	.969*	.012	.000	.934	1.005
		25 – 29	.123*	.009	.000	.098	.147
		40 – 49	.074*	.006	.000	.057	.091
		50 – 59	.453*	.007	.000	.434	.472
		60 and above	-.464*	.009	.000	-.491	-.437
	40 – 49	Under 25	.895*	.012	.000	.859	.930
		25 – 29	.049*	.009	.000	.024	.073
		30 – 39	-.074*	.006	.000	-.091	-.057
		50 – 59	.379*	.007	.000	.360	.398
		60 and above	-.538*	.009	.000	-.565	-.511
	50 – 59	Under 25	.516*	.013	.000	.480	.552
		25 – 29	-.330*	.009	.000	-.356	-.304
		30 – 39	-.453*	.007	.000	-.472	-.434
		40 – 49	-.379*	.007	.000	-.398	-.360
		60 and above	-.917*	.010	.000	-.945	-.889
	60 and above	Under 25	1.433*	.014	.000	1.392	1.474
		25 – 29	.587*	.011	.000	.555	.619
		30 – 39	.464*	.009	.000	.437	.491
		40 – 49	.538*	.009	.000	.511	.565
		50 – 59	.917*	.010	.000	.889	.945

*The mean difference is significant at the .05 level

Table B11 – One-way ANOVA Descriptive Statistics – Student Engagement Self-Efficacy and Years of Experience

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
0 – 5	263849	11.798	2.2864	.0045	11.789	11.807	5.054	15.681
6 – 10	185302	11.621	2.4905	.0058	11.610	11.632	5.501	15.681
11 – 15	185358	12.142	2.3574	.0055	12.131	12.153	4.028	15.681
16 – 20	166921	11.859	2.4083	.0059	11.848	11.871	5.767	15.681
21 – 25	117805	12.462	2.2665	.0066	12.449	12.475	7.240	15.681
26 – 30	79173	12.382	2.1963	.0078	12.367	12.398	7.913	15.681
More than 30	84144	11.439	2.8780	.0099	11.419	11.458	6.526	15.681
Total	1082551	11.923	2.4147	.0023	11.919	11.928	4.028	15.681

Table B12 – Games-Howell Post-Hoc – Student Engagement Teacher Self-Efficacy and Years of Experience

	(I) Years of Experience	(J) Years of Experience	Mean difference (I-J)	Std. Error	Sig.	95% CI	
						Lower Bound	Upper Bound
Games-Howell	0 – 5	6 – 10	.177*	.007	.000	.156	.199
		11 – 15	-.344*	.007	.000	-.365	-.323
		16 – 20	-.061*	.007	.000	-.083	-.039
		21 – 25	-.664*	.008	.000	-.688	-.641
		26 – 30	-.584*	.009	.000	-.611	-.558
		More than 30	.359*	.011	.000	.327	.391
	6 – 10	0 – 5	-.177*	.007	.000	-.199	-.156
		11 – 15	-.521*	.008	.000	-.545	-.498
		16 – 20	-.238*	.008	.000	-.263	-.214
		21 – 25	-.841*	.009	.000	-.867	-.815
		26 – 30	-.761*	.010	.000	-.790	-.733
		More than 30	.182*	.011	.000	.148	.216
	11 – 15	0 – 5	.344*	.007	.000	.323	.365
		6 – 10	.521*	.008	.000	.498	.545
		16 – 20	.283*	.008	.000	.259	.307
		21 – 25	-.320*	.009	.000	-.345	-.295
		26 – 30	-.240*	.010	.000	-.268	-.212
		More than 30	.703*	.011	.000	.670	.737
	16 – 20	0 – 5	.061*	.007	.000	.039	.083
		6 – 10	.238*	.008	.000	.214	.263
		11 – 15	-.283*	.008	.000	-.307	-.259
		21 – 25	-.603*	.009	.000	-.629	-.577
		26 – 30	-.523*	.010	.000	-.552	-.494
		More than 30	.420*	.012	.000	.386	.454
	21 – 25	0 – 5	.664*	.008	.000	.641	.688
		6 – 10	.841*	.009	.000	.815	.867
		11 – 15	.320*	.009	.000	.295	.345
		16 – 20	.603*	.009	.000	.577	.629
		26 – 30	.080*	.010	.000	.050	.110
		More than 30	1.023*	.012	.000	.988	1.059
	26 – 30	0 – 5	.584*	.009	.000	.558	.611
		6 – 10	.761*	.010	.000	.733	.790
		11 – 15	.240*	.010	.000	.212	.268
		16 – 20	.523*	.010	.000	.494	.552
		21 – 25	-.080*	.010	.000	-.110	-.050

	More than 30	.943*	.013	.000	.906	.981
More than 30	0 – 5	-.359*	.011	.000	-.391	-.327
	6 – 10	-.182*	.011	.000	-.216	-.148
	11 – 15	-.703*	.011	.000	-.737	-.670
	16 – 20	-.420*	.012	.000	-.454	-.386
	21 – 25	-1.023*	.012	.000	-1.059	-.988
	26 – 30	-.943*	.013	.000	-.981	-.906

Table B13 – One-way ANOVA Descriptive Statistics – Overall Self-Efficacy and Age

					95% Confidence Interval for Mean			
	N	Mean	Std. Deviation	Std. Error	Lower Bound	Upper Bound	Minimum	Maximum
Under 25	31351	11.918	2.0899	.0118	11.895	11.941	6.789	16.309
25 – 29	99333	12.535	2.1072	.0067	12.522	12.548	6.961	16.309
30 – 39	286865	12.742	2.1010	.0039	12.735	12.750	7.224	16.309
40 – 49	312184	12.931	2.1684	.0039	12.924	12.939	2.681	16.309
50 – 59	258059	12.359	2.2805	.0045	12.351	12.368	4.132	16.309
60 and above	80647	12.934	2.3724	.0084	12.918	12.951	7.224	16.309
Total	1068440	12.676	2.2021	.0021	12.672	12.680	2.681	16.309

Table B14 – Games Howell Post-Hoc – Overall Self-Efficacy and Age

	(I) Teacher Age Group	(J) Teacher Age Group	Mean difference (I-J)	Std. Error	Sig.	95% CI Lower Bound	95% CI Upper Bound
Games-Howell	Under 25	25 – 29	-.6176*	.0136	.000	-.656	-.579
		30 – 39	-.8246*	.0124	.000	-.860	-.789
		40 – 49	-1.0137*	.0124	.000	-1.049	-.978
		50 – 59	-.4417*	.0126	.000	-.478	-.406
		60 and above	-1.0167*	.0145	.000	-1.058	-.976
	25 – 29	Under 25	.6176*	.0136	.000	.579	.656
		30 – 39	-.2070*	.0078	.000	-.229	-.185
		40 – 49	-.3961*	.0077	.000	-.418	-.374
		50 – 59	.1759*	.0081	.000	.153	.199
		60 and above	-.3992*	.0107	.000	-.430	-.369
	30 – 39	Under 25	.8246*	.0124	.000	.789	.860
		25 – 29	.2070*	.0078	.000	.185	.229
		40 – 49	-.1891*	.0055	.000	-.205	-.173
		50 – 59	.3830*	.0060	.000	.366	.400
		60 and above	-.1921*	.0092	.000	-.218	-.166
	40 – 49	Under 25	1.0137*	.0124	.000	.978	1.049
		25 – 29	.3961*	.0077	.000	.374	.418
		30 – 39	.1891*	.0055	.000	.173	.205
		50 – 59	.5720*	.0059	.000	.555	.589
		60 and above	-.0031	.0092	.999	-.029	.023
	50 – 59	Under 25	.4417*	.0126	.000	.406	.478
		25 – 29	-.1759*	.0081	.000	-.199	-.153
		30 – 39	-.3830*	.0060	.000	-.400	-.366
		40 – 49	-.5720*	.0059	.000	-.589	-.555
		60 and above	-.5751*	.0095	.000	-.602	-.548
	60 and above	Under 25	1.0167*	.0145	.000	.976	1.058
		25 – 29	.3992*	.0107	.000	.369	.430
		30 – 39	.1921*	.0092	.000	.166	.218
		40 – 49	.0031	.0092	.999	-.023	.029
		50 – 59	.5751*	.0095	.000	.548	.602

*The mean difference is significant at the .05 level

Table B15 – One-way ANOVA Descriptive Statistics – Overall Self-Efficacy and Years of Experience

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
0 – 5	263849	12.266	2.1163	.0041	12.258	12.274	6.789	16.309
6 – 10	185302	12.641	2.1678	.0050	12.631	12.651	6.692	16.309
11 – 15	185358	12.957	2.1346	.0050	12.947	12.967	2.681	16.309
16 – 20	166696	12.778	2.2132	.0054	12.767	12.788	4.132	16.309
21 – 25	117805	13.262	2.1024	.0061	13.250	13.274	7.224	16.309
26 – 30	79173	13.044	1.9671	.0070	13.031	13.058	7.224	16.309
More than 30	84144	12.079	2.6135	.0090	12.061	12.096	7.224	16.309
Total	1082327	12.678	2.2040	.0021	12.674	12.682	2.681	16.309

Table B16 – Games Howell Post-Hoc – Overall Self-Efficacy and Years of Experience

	(I) Years of Experience	(J) Years of Experience	Mean difference (I-J)	Std. Error	Sig.	95% CI	
						Lower Bound	Upper Bound
Games-Howell	0 – 5	6 – 10	-.376*	.007	.000	-.395	-.356
		11 – 15	-.691*	.006	.000	-.710	-.672
		16 – 20	-.512*	.007	.000	-.532	-.492
		21 – 25	-.996*	.007	.000	-1.018	-.974
		26 – 30	-.779*	.008	.000	-.803	-.755
		More than 30	.187*	.010	.000	.158	.216
	6 – 10	0 – 5	.376*	.007	.000	.356	.395
		11 – 15	-.316*	.007	.000	-.337	-.295
		16 – 20	-.136*	.007	.000	-.158	-.115
		21 – 25	-.621*	.008	.000	-.644	-.597
		26 – 30	-.403*	.009	.000	-.429	-.378
		More than 30	.562*	.010	.000	.532	.593
	11 – 15	0 – 5	.691*	.006	.000	.672	.710
		6 – 10	.316*	.007	.000	.295	.337
		16 – 20	.180*	.007	.000	.158	.201
		21 – 25	-.305*	.008	.000	-.328	-.282
		26 – 30	-.087*	.009	.000	-.113	-.062
		More than 30	.878*	.010	.000	.848	.909
	16 – 20	0 – 5	.512*	.007	.000	.492	.532
		6 – 10	.136*	.007	.000	.115	.158
		11 – 15	-.180*	.007	.000	-.201	-.158
		21 – 25	-.484*	.008	.000	-.508	-.460
		26 – 30	-.267*	.009	.000	-.293	-.241
		More than 30	.699*	.011	.000	.668	.730
	21 – 25	0 – 5	.996*	.007	.000	.974	1.018
		6 – 10	.621*	.008	.000	.597	.644
		11 – 15	.305*	.008	.000	.282	.328
		16 – 20	.484*	.008	.000	.460	.508
		26 – 30	.217*	.009	.000	.190	.245
		More than 30	1.183*	.011	.000	1.151	1.215
	26 – 30	0 – 5	.779*	.008	.000	.755	.803
		6 – 10	.403*	.009	.000	.378	.429
		11 – 15	.087*	.009	.000	.062	.113
		16 – 20	.267*	.009	.000	.241	.293
		21 – 25	-.217*	.009	.000	-.245	-.190
		More than 30	.966*	.011	.000	.932	.999

More than 30	0 – 5	-.187*	.010	.000	-.216	-.158
	6 – 10	-.562*	.010	.000	-.593	-.532
	11 – 15	-.878*	.010	.000	-.909	-.848
	16 – 20	-.699*	.011	.000	-.730	-.668
	21 – 25	-1.183*	.011	.000	-1.215	-1.151
	26 – 30	-.966*	.011	.000	-.999	-.932

Table B17 – One-way ANOVA Descriptive Statistics – Classroom Management Teacher Self-Efficacy and Observer

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Never	519532	12.389	2.2168	.003	12.383	12.395	4.137	15.282
Once a year	251641	12.562	2.1181	.004	12.554	12.570	6.820	15.282
More than once a year	308239	13.111	2.1251	.004	13.103	13.118	4.137	15.282
Total	1079412	12.635	2.1899	.002	12.631	12.640	4.137	15.282

Table B18 – Games Howell Post-Hoc – Classroom Management Teacher Self-Efficacy and Observers

						95% CI	
	(I) Observer	(J) Observer	Mean difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
Games-Howell	Never	Once a year	-.173*	.005	.000	-.185	-.161
		More than once a year	-.722*	.005	.000	-.733	-.710
	Once a year	Never	.173*	.005	.000	.161	.185
		More than once a year	-.549*	.006	.000	-.562	-.535
	More than once a year	Never	.722*	.005	.000	.710	.733
		Once a year	.549*	.006	.000	.535	.562

*. The mean difference is significant at the 0.05 level.

Table B19 – One-way ANOVA Descriptive Statistics – Instruction Teacher Self-Efficacy and Observer

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Never	519532	12.315	2.2085	.0031	12.309	12.321	3.530	15.439
Once a year	251416	12.586	2.0981	.0042	12.578	12.594	7.499	15.439
More than once a year	308239	13.073	2.2074	.0040	13.065	13.081	6.584	15.439
Total	1079187	12.595	2.2064	.0021	12.591	12.599	3.530	15.439

Table B20 – Games Howell Post-Hoc – Instruction Self-Efficacy and Observer

	(I) Observer	(J) Observer	Mean difference (I-J)	Std. Error	Sig.	95% CI	
						Lower Bound	Upper Bound
Games-Howell	Never	Once a year	-.271*	.005	<.001	-.283	-.259
		More than once a year	-.758*	.005	<.001	-.769	-.746
	Once a year	Never	.271*	.005	<.001	.259	.283
		More than once a year	-.487*	.006	<.001	-.500	-.473
	More than once a year	Never	.758*	.005	<.001	.746	.769
		Once a year	.487*	.006	<.001	.473	.500

*. The mean difference is significant at the 0.05 level.

Table B21 – One-way ANOVA Descriptive Statistics – Student Engagement Self-Efficacy and Observer

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Never	519532	11.612	2.3517	.0033	11.605	11.618	4.028	15.681
Once a year	251641	11.833	2.2436	.0045	11.825	11.842	5.054	15.681
More than once a year	308239	12.508	2.5399	.0046	12.499	12.517	4.744	15.681
Total	1079412	11.919	2.4133	.0023	11.915	11.924	4.028	15.681

Table B22 – Games Howell Post-Hoc – Student Engagement Self-Efficacy and Observer

	(I) Observer	(J) Observer	Mean difference (I-J)	Std. Error	Sig.	95% CI Lower Bound	95% CI Upper Bound
Games-Howell	Never	Once a year	-.222*	.006	.000	-.235	-.209
		More than once a year	-.896*	.006	.000	-.909	-.883
	Once a year	Never	.222*	.006	.000	.209	.235
		More than once a year	-.674*	.006	.000	-.689	-.659
	More than once a year	Never	.896*	.006	.000	.883	.909
		Once a year	.674*	.006	.000	.659	.689

*. The mean difference is significant at the 0.05 level.

Table B23 – One-way ANOVA Descriptive Statistics – Overall Self-Efficacy and Observer

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean Lower Bound	95% Confidence Interval for Mean Upper Bound	Minimum	Maximum
Never	519532	12.349	2.1318	.0030	12.343	12.354	2.681	16.309
Once a year	251416	12.609	2.0605	.0041	12.601	12.617	7.224	16.309
More than once a year	308239	13.281	2.3073	.0042	13.273	13.290	6.658	16.309
Total	1079187	12.676	2.2034	.0021	12.671	12.680	2.681	16.309

Table B24 – Games Howell Post-Hoc – Overall Self-Efficacy and Observer

	(I) Observer	(J) Observer	Mean difference (I-J)	Std. Error	Sig.	95% CI Lower Bound	95% CI Upper Bound
Games-Howell	Never	Once a year	-.260*	.005	.000	-.272	-.248
		More than once a year	-.933*	.005	.000	-.945	-.921
	Once a year	Never	.260*	.005	.000	.248	.272
		More than once a year	-.673*	.006	.000	-.686	-.659
	More than once a year	Never	.933*	.005	.000	.921	.945
		Once a year	.673*	.006	.000	.659	.686

*. The mean difference is significant at the 0.05 level.