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Understanding K-12 Teachers' Emotional Intelligence: Theory, Measurement, And Validation

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UNDERSTANDING K-12 TEACHERS' EMOTIONAL INTELLIGENCE: THEORY, MEASUREMENT, AND VALIDATION

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DEDICATION

This dissertation is wholeheartedly dedicated to my beloved parents, 张梅 and 黄志远, you gave me life and have always believed in me and supported me in everything I wanted to do. Your love and encouragement have been my constant source of strength.

And to my husband, 梁冠伦, you showed me the meaning of unconditional love and kindness. You have been my rock throughout this journey. Your unwavering belief in me and encouragement through the late nights and long weeks of research and writing kept me motivated and on track. I am forever grateful for your patience and understanding during this time and am so blessed to have you by my side.

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Abstract

Teacher emotional intelligence (EI) plays an important role in teachers' professional lives. After surveying the topic and the gaps in the relevant literature, I conducted three studies to advance our current understanding of teachers' EI. The first study involved a meta-analysis review that examined the relationship between K-12 teachers' EI, self-efficacy, and burnout. It found that there is a significant positive relationship between K-12 teachers' EI and teacher self-efficacy as well as a significant negative relationship between teachers' EI and teacher burnout. The second study involved developing and testing the Teachers' Emotional Intelligence Scale (TEIS), which measures teachers' EI in their professional settings through self-perspectives. Among a sample of 328 K-12 in-service teachers, results showed that TEIS had a 4-factor model for teacher self-dimension and a 5-factor model for teacher-student interaction dimension. Both dimensions appear to exhibit reasonable levels of convergent and discriminant validity and Cronbach alpha estimates appear adequate for general research purposes. The third study, a mixed-methods study, aimed to examine teachers' EI in a Chinese context and validate TEIS. The qualitative findings not only indicated the importance of teachers' EI, but also supported the second study's teachers' EI conceptualization in China. For the quantitative study, data from factor analyses provided evidence for the 5-factor model and two dimensions solution. High internal consistency estimated as well as preliminary evidence of convergent and discriminant validity of TEIS scores show its promise as a reliable and potentially valid measure for teachers' EI. Implications for practice and research are discussed.

UNDERSTANDING K-12 TEACHERS' EMOTIONAL INTELLIGENCE: THEORY, MEASUREMENT, AND VALIDATION

CHAPTER 1: Introduction

Effective teaching and student learning are central goals for the educational system. Although seeking to achieve these goals involves many complexities, certain factors have been shown to support it. One of these is teachers' Emotional Intelligence (EI), which refers to a set of abilities or traits that involve the way people perceive, express, understand, and manage their own emotions as well as the emotions of others (Spielberger, 2004). Research has shown that teachers' EI is linked to teaching effectiveness (Akram et al., 2019; Taseer, 2020); student academic achievement (Curci et al., 2014; Nizielski et al., 2012; Pozo-Rico & Sandoval, 2020); teacher job satisfaction (Wong et al., 2010; Yin et al., 2013); and teacher performance (Go et al., 2020; Wu et al., 2019).

Despite knowing that teachers' EI is essential to effective teaching and student learning, there are several gaps in our understanding of teachers' EI including (a) how teachers' EI is related to teacher effectiveness and well-being, (b) how teachers' EI can be measured in their professional settings, (c) how teachers' EI can be measured in a different cultural context such as China. The purpose of this dissertation research is to address each of these gaps through three related studies to help improve understanding of teachers' EI and to foster teachers' EI, which may lead to better teacher effectiveness and teacher well-being, and further influence learning and social-emotional outcomes among students.

Before diving into the research design for the three studies, this chapter first starts with a discussion of the problem related to teachers' EI, teacher well-being, and teacher effectiveness based on the literature. Then, I introduce theoretical frameworks in the literature and clarify the

theoretical framework that will guide this study. After that, I describe my three research designs in detail and how these studies contribute to the literature.

Statement of the Problem

Teachers' Emotional Intelligence and Well-being

Teacher well-being issues caused by stress and negative emotions are pervasive among K-12 teachers. In Herman et al.'s (2018) and Herman et al.'s (2020) study, nearly all participants (kindergarten teachers, elementary school teachers, and middle school teachers) reported moderate to high levels of professional stress. K-12 teachers suffered from multiple stressors ranging from classroom management demands and pressure from accountability policies to external demands from parents or the small everyday pedagogical and student social-emotional requirements of the classroom (Katz et al., 2016; Nathaniel et al., 2016; Ryan & Moller, 2017; Saeki et al., 2018; Van Droogenbroeck & Spruyt, 2015).

The COVID-19 pandemic has only added to teacher stress. A survey that explored teachers' emotions during the pandemic showed that the five most frequently mentioned emotions among over 5,000 U.S. teachers were anxious, fearful, worried, overwhelmed, and sad (Brackett & Cipriano, 2020). These unpleasant emotions are strongly associated with teacher burnout and raised concerns about teacher well-being (Brackett et al., 2010; Chang, 2013; Liljestrom et al., 2007; Pepe & Addimando, 2014; Sutton, 2007). In addition, RAND surveyed a nationally representative sample of public school teachers in the U.S. in late January and early February 2021. Findings showed that more than 3 in 4 teachers reported frequent job-related stress, compared to 40% of other working adults, and 27 % of teachers reported symptoms of depression, compared to 10% of other adults (Steiner & Woo, 2021). Indeed, 90% of educators mentioned that burnout is a serious problem in a National Education Association survey (Jotkoff,

2022). Teacher burnout is continually ranked as a primary reason teachers become dissatisfied with the profession and end up leaving their positions (Darling-Hammond, 2001). Nearly 1 in 4 teachers said that they were likely to leave their jobs by the end of the 2020–2021 school year, compared to 1 in 6 teachers who were likely to leave, on average, before the pandemic (Steiner & Woo, 2021). The high teacher turnover rate raises concerns about the adverse effects high attrition poses to educational quality as well as to school budgets (DeFeo et al., 2017; Ronfeldt et al., 2013; Sutcher et al., 2019).

Importantly, as teachers' EI increases, their turnover rate tends to decrease (L. Li et al., 2011; Mérida-López et al., 2020). Teachers who are skillful at mastering stress, burnout, and social-emotional challenges feel more efficacious, and teaching becomes more enjoyable and rewarding to them (Goddard et al., 2004). Previous studies have indicated that EI was positively related to well-being in many populations (Carmeli et al., 2009; Schutte et al., 2007; Vicente-Galindo et al., 2017). In the case of K-12 education, teachers' EI may be a promising skill to improve teachers' well-being and for coping with professional stress and burnout.

Teachers' EI and Teacher Effectiveness

Teachers' EI also shows the potential to improve teacher effectiveness. Teacher effectiveness refers to the aggregated effects of a complex set of in-classroom teacher behaviors on student learning (Seidel & Shavelson, 2007). On one hand, from the perspective of characteristics of effective teachers, teachers' EI could positively affect teacher self-efficacy (Agbaria, 2021; Chan, 2008; Mouton et al., 2013); job satisfaction (Wong et al., 2010; Yin et al., 2013); and engagement (Butakor et al., 2021; Mérida-López et al., 2019). All these characteristics have shown positive significant relationships with or have been considered as indicators of teacher effectiveness (S. Huang et al., 2013; Klassen & Tze, 2014; Stronge, 2018;

Valenta, 2010). In contrast, findings suggest that teachers with inadequate EI skills may have difficulty managing their emotions and be less effective in classroom management efforts (Montgomery & Rupp, 2005). Indeed, two studies reported direct, strong, and significant relationships between teachers' EI and teacher effectiveness in Pakistan but with different effect sizes (Akram et al., 2019; Taseer, 2020). On the other hand, from the perspective of the outcome of teacher effectiveness, studies have indicated the important positive impact of teachers' EI on student achievement (Curci et al., 2014; Pozo-Rico & Sandoval, 2020). Yet, teachers have often been overlooked by EI researchers. Although the research literature continues to report that EI is related to a variety of personal and performance factors across different samples, limited studies have been found exploring the EI of K-12 teachers (Schutte et al., 2007; Van Rooy & Viswsvaran, 2004).

In sum, even though teachers' EI has the potential to improve teacher well-being but also teacher effectiveness which could then benefit students' academic learning and psychological development (Freeman & Strong, 2017), the current understanding of K-12 teachers' EI is limited. Given the pivotal role of teachers and their current tough psychological states, there is a great need to support teachers both professionally and personally to ensure their well-being. Meanwhile, to achieve student and school success, teacher effectiveness is an essential component that must not be ignored. Examining the role of teachers' EI in supporting teachers' well-being and teacher effectiveness may lead to new avenues. Yet until recently, few studies have explored the relationships between teachers' EI, teachers' well-being, and teacher effectiveness. Fortunately, several recent studies have demonstrated that stronger EI among teachers may result in improved indicators of teacher effectiveness such as teacher self-efficacy

(e.g., Agbaria, 2021), as well as indicators of teacher well-being like burnout (e.g., Barari & Barari, 2015).

Moreover, though some studies have affirmed the importance of teachers' EI, there is a dearth of EI assessments designed for K-12 teachers. Without a more complete understanding and accurate assessment of teachers' EI, it will be hard to improve it. In addition, researchers have questioned the validity and reliability of existing EI instruments for K-12 teachers (Locke, 2005; MacCann et al., 2003; Maul, 2012).

Finally, teachers' EI cannot be fully understood without taking into consideration their cultural characteristics (Moon, 2011). However, there is a lack of studies exploring teachers' EI outside of western cultures. Specifically, there is a lack of studies on teachers' EI as well as valid and reliable teachers' EI instruments in China. Hence, to explore teachers' EI in greater depth to address the three gaps in the literature, I propose a three-article dissertation.

Theoretical Frameworks

Emotional Intelligence

Despite there being a definition of EI in the *Encyclopedia of Applied Psychology* (Spielberger, 2004), researchers define EI in different ways, such as cognitive processes, motivational factors, and personality characteristics (Zeidner et al., 2004). Matthews et al. (2004) defined EI as "the competence to identify and express emotions, understand emotions, assimilate emotions into thought, and regulate both positive and negative emotions in the self and others" (p. 3). Meanwhile, Bechara et al. (2000) defined EI as "a collection of emotional abilities that constitute a form of intelligence that is different from cognitive intelligence or IQ" (p. 211). Based on the array of definitions, researchers have developed various models and measurements through theoretical and empirical research over the last 2 decades (O'Connor et al., 2019).

According to Ashkanasy and Daus (2005), EI research and models can be grouped into three main streams: Our-branch ability models that conceptualize EI as abilities that can be learned with training (Mayer & Salovey, 1997; Mayer et al., 2016); models of EI that encompass various self- and peer-report based on Mayer-Salovey representation (e.g., Schutte et al., 1998); and mixed models that comprise expanded models of EI and encompass components not included in Mayer and Salovey's definition (e.g., Bar-On, 1997; Goleman, 1995; Petrides et al., 2016).

Even though there are a variety of alternative models that have been proposed for the EI construct, most of them share core elements. Namely, EI involves skills of perceiving, understanding, and managing emotions. These skills could be exercised both intrapersonally (e.g., concerning one's own emotions) and interpersonally (e.g., concerning the emotions of others).

Social-Emotional Competence

Instead of building on adult research as EI has been, Social-Emotional Learning (SEL) was developed in the realm of student learning. The SEL approach integrates competence promotion and youth development frameworks for reducing risk factors and fostering protective mechanisms for positive adjustment (Catalano et al., 2004; Guerra & Bradshaw, 2008; Weissberg et al., 2003). The proximal goal of SEL programs is to foster the development of students' social emotional competencies (SEC). Like EI, there are different definitions of SEC in the literature. Although SEC has been examined for many years, the definitions have been debated (Stump et al., 2009), resulting in a lack of consensus. Across the various definitions, a common theme is that SEC is an umbrella term that subsumes a variety of social or emotional abilities and/or behaviors (e.g., S. I. Saarni et al., 2006; Semrud-Clikeman, 2007). It includes a wide range of competencies from EI and stems from the literature on children and adolescents.

Similar to the ability EI model, SEC is often considered a skill that indicates the possibility of change and development.

In the present dissertation, I choose the EI model as the theoretical framework. The first reason is to keep EI constrained as a set of emotion-related skills, (i.e., the perception, use, understanding, and management of emotion). Compared to SEC, EI has a narrower definition. This makes it possible to assess the degree that EI skills specifically contribute to behavior, as well as provide a firm foundation for developing programs to enhance these skills (Brackett & Geher, 2006). Second, EI was developed based on adult research and associated with a wide range of critical outcomes among adults, so it may be more appropriate for teachers. Third, EI determines individual differences in the implementation of SEC, such as recognizing and managing emotions, developing care and concern for others, making responsible decisions, establishing positive relationships, and coping effectively with confrontations (Jennings & Greenberg, 2009). Conducting research based on EI is helpful to understand individual differences in teacher SEC.

The Dissertation Research

Although some research studies have established that teachers' EI is critical for teachers and students, further research is needed to understand the concept of teachers' EI and how to assess it. The objective of this dissertation research is to address the gaps in the literature, as described above, through three related studies. To achieve the research goal, the following research questions will direct the study:

Study 1: a. What is the effect size of teachers' EI in relation to teacher self-efficacy?

b. What is the effect size of teachers' EI in relation to teacher burnout?

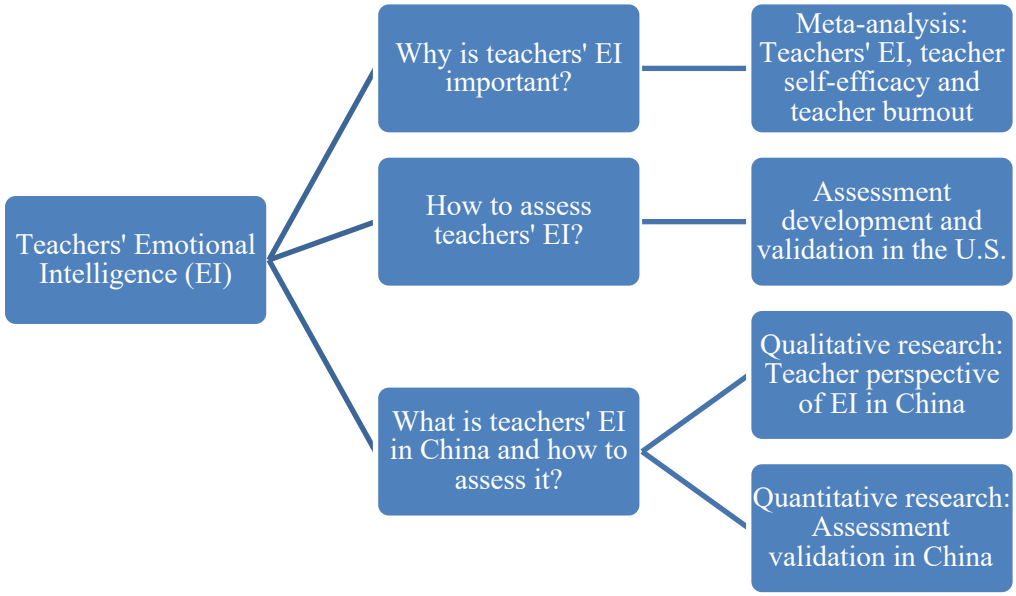
Study 2: To what extent can teachers' EI be assessed in a way that is valid and reliable?

Study 3: To what extent is the EI measure of teachers' EI valid and reliable among teachers in China?

An overview of the research design is depicted in Figure 1.

Figure 1

Dissertation Research Design



For the first study, I address the dearth of studies exploring the relationship between teachers' EI, well-being, and effectiveness. As effectiveness and well-being are quite broad constructs, I narrow the studies' scope by using teacher self-efficacy as an indicator of teacher effectiveness and teacher burnout as an indicator of teacher well-being. In brief, the purpose of the first study is to offer a meta-analysis review of the relationships between K-12 teachers' EI and teacher self-efficacy as well as the relationships between teachers' EI and teacher burnout, which are representing teacher effectiveness and teacher well-being. Although several previous researchers explored the relationships between K-12 teachers' EI, self-efficacy, and burnout, differences in effect sizes suggest the need for a meta-analysis to establish the most accurate

estimates of effect sizes. This review could develop a more helpful estimate of the magnitude of the effect between teachers' EI, self-efficacy, and burnout to better understand the importance of teachers' EI.

I investigate the measurement of teachers' EI in the second study. An EI instrument based upon teachers' perceptions of core aspects of their work is developed and tested. This self-report instrument is distinct from existing instruments because it asks teachers to report EI closely related to their professional work in more detail. Though existing measures are useful for providing an understanding of individual functioning overall, we still do not understand teachers' EI in their professional settings. The teachers' EI instrument that I developed in the second study addresses this gap. It also builds an understanding of the underlying dimensions of teachers' EI and how these dimensions influence teachers' well-being and burnout.

The final study in this dissertation aims at understanding teachers' EI from a cross-cultural perspective. It examines teachers' EI from teachers' perspective, explores the relationships among teachers' EI, teacher well-being, teacher self-efficacy, teacher burnout, and teacher-student relationship in China as well as validates the new EI measure developed in the second study. This type of examination is important for gaining an understanding of the development or stability of teachers' EI and the new measure across cultures.

Significance of the Study

Taken together, the three studies address several gaps in the literature and provide a comprehensive and systematic examination of teachers' EI. Moreover, the three studies help to improve our understanding of the highly important dimensions of teachers' EI not only independently, but also as they interact with one another. Although the research focuses on teachers, the implications extend to students and schools. After all, emotionally intelligent

teachers encourage greater learning, achievement, and positive social-emotional development among their students (Jennings & Greenberg, 2009; Jones & Bouffard, 2012).

Defining Terms and Core Concepts

Social emotional competence (SEC). an umbrella term that subsumes a variety of social or emotional abilities and/or behaviors (S. I. Saarni et al., 2006).

Social emotional learning (SEL). as the process of acquiring core competencies to recognize and manage emotions, set and achieve positive goals, appreciate the perspectives of others, establish and maintain positive relationships, make responsible decisions, and handle interpersonal situations constructively (Elias et al., 1997).

Teacher burnout. as a set of symptoms that include emotional exhaustion, as the feeling of being physically and emotionally overextended; depersonalization, a distant attitude toward students; and reduced professional accomplishment (Maslach et al., 2001).

Teacher effectiveness. "the impact that classroom factors, such as teaching methods, teacher expectations, classroom organization, and use of classroom resources, have on students' performance" (Campbell et al., 2004, p. 3).

Teacher emotional intelligence (TEI). "the ability to monitor one's own and others' feelings and emotions, to discriminate among them and to use this information to guide one's thinking and actions" (Mayer & Salovey, 1997, p. 189).

Teacher self-efficacy. a judgment of one's own capabilities to bring about desired outcomes of student engagement and learning, even when students are difficult or unmotivated (Tschannen-Moran & Woolfolk Hoy, 2001).

Teacher well-being. "open, engaged, and healthy functioning" (Ryan & Deci, 2011, p. 47).

CHAPTER 2: The Relationships between Teachers' Emotional Intelligence, Self-Efficacy, and Burnout: A Meta-Analysis Study

Emotional intelligence (EI) refers to a set of abilities that involve the way people perceive, express, understand, and manage their own emotions as well as the emotions of others (Spielberger, 2004). Using various instruments and definitions, studies confirm the predictive validity of teachers' EI by indicating that teachers' EI exerts influence over student and teacher outcomes. For example, higher levels of emotional intelligence have been found to improve teachers' perception of their success in the classroom, also known as teacher self-efficacy (Agbaria, 2021; Chan, 2004; Mouton et al., 2013; Poulou, 2017c). Studies also reported that teacher self-efficacy positively links with students' academic achievement, patterns of teacher behavior and practices related to classroom quality, and factors underlying teachers' psychological well-being, including personal accomplishment, job satisfaction, and commitment (Aloe et al., 2014; Collie at al., 2012; Klassen & Chiu, 2011; Thoonen et al., 2011).

Meanwhile, researchers have reported that teachers' EI may be the key to reducing teacher burnout (Fiorilli et al., 2019; Ju et al., 2015), which is traditionally conceptualized as resulting from long term occupational stress (Maslach et al., 1997). Teacher burnout has been shown to have significant negative implications not only for teachers' well-being in terms of their mental health (Schonfeld & Bianchi, 2016) and teacher job satisfaction (Klassen et al., 2010; Robinson et al., 2019), but also student achievement (Herman et al., 2018; Klusmann et al., 2016) and adjustment (Oberle & Schonert-Reichl, 2016). Namely, according to current

primary studies, improving teachers' EI may lead to better teacher self-efficacy and less teacher burnout, and further influence students' learning.

After extensive research, I did not find prior meta-analyses that examined K-12 teachers' EI, teacher self-efficacy, and teacher burnout. Therefore, the relationships among these variables remain unclear due to the difference in effect sizes among primary studies. This suggests a need for the use of meta-analytic techniques for establishing the most accurate estimates of effect size. Accordingly, in this study, I perform a meta-analysis to explore relationships among teachers' EI, teacher self-efficacy, and teacher burnout.

Literature Review

Emotional Intelligence

Based on the array of definitions, researchers have developed various models and measurements through theoretical and empirical research over the last two decades (O'Connor et al., 2019). Research on EI have been classified into three streams: "(1) a four-branch abilities test based on the model of EI defined in Mayer and Salovey (1997); (2) self-report instruments based on the Mayer–Salovey model; and (3) commercially available tests that go beyond the Mayer–Salovey definition" (Ashkanasy & Daus, 2005, p. 441). These streams have become known as ability EI (Stream 1), self-report EI (Stream 2), and mixed EI (Stream 3). Ability EI studies conceptualize EI as abilities that can be learned with training (Mayer & Salovey, 1997; Mayer et al., 2016). The MSCEIT V2.0 (Mayer et al., 2003) is representative of an ability EI measure that is similar to more traditional measures of intelligence by having objective right and wrong answers. Researchers support Stream 2 EI measures have asserted that self-reporting would be an excellent way to assess EI. Representative measures in Stream 2 category include self-report measures such as Assessing Emotions Scales (AES; Schutte et al., 1998) and Wong and Law's

(2002) Emotional Intelligence Scale (WLEIS). The Stream 3 models are also known as the mixed models, because most of the studies in this stream expanded models of emotional intelligence that encompass components not included in Salovey and Mayer's definition with overlaps with a set of personality traits (e.g., Bar-On, 1997; Goleman, 1995). The Bar-On (2002) Emotional Quotient Inventory (EQ-i) and the Emotional and Social Competency Inventory (ESCI; Boyatzis et al., 2011) are two popular mixed EI measures. According to current literature, studies have found that these three streams of EI are related yet still distinct from each other in a number of ways (Miao et al., 2017; O'Boyle et al., 2011). Therefore, it is important to test whether the three streams differ in their correlations with teacher self-efficacy and burnout.

Teacher Self-Efficacy

Self-efficacy reflects individuals' beliefs in the capability to exercise control over actions that affect their lives (Bandura, 1997). In the teaching profession, Tschannen-Moran and Woolfolk Hoy (2001) referred teacher self-efficacy as teachers' beliefs in their capability to produce desired educational outcomes. Characteristics of teacher effectiveness have been identified and linked to higher self-efficacy beliefs, which refers to better capacity to manage the classroom, motivate and involve students, and use appropriate teaching strategies. After a review of 165 eligible articles, Zee and Koomen (2016) claimed that teacher self-efficacy was a powerful predictor of students' academic adjustment, patterns of teacher behavior, and practices related to classroom quality. Further, a meta-analysis of 42 studies revealed that self-efficacy is strongly associated with observed teaching performance (Klassen & Tze, 2014). Moreover, positive teacher self-efficacy beliefs have been demonstrated to result in improved psychological well-being in terms of higher levels of job satisfaction and commitment and lower levels of stress and burnout (Aloe et al., 2014; Collie et al., 2012; Klassen & Chiu, 2011).

According to Bandura (1997), both self-awareness and control of emotions are critical to the development of self-efficacy since individuals who exhibit higher self-awareness and higher control of their emotions are likely to be more successful and consequently develop stronger self-efficacy beliefs. Hence, EI, which represents the abilities to influence the awareness and control of emotions, could play an important role in the self-efficacy development process (Gundlach et al., 2003).

Teacher Burnout

Teacher burnout is defined as a set of symptoms that include emotional exhaustion, as the feeling of being physically and emotionally overextended; depersonalization, a distant attitude toward students; and reduced professional accomplishment (Maslach et al., 2001). Burnout can lead to reduced well-being, job performance, and job commitment, as well as an increased likelihood of attrition (Herman et al., 2018; McLean et al., 2019; Skaalvik & Skaalvik, 2017). Conversely, studies highlight the adverse effect of burnout in predicting teachers' subsequent emotions and psychopathological symptoms (Burić et al., 2019). It has been negatively associated with mental and physical health (Hultell et al., 2013). Additionally, student achievements have been found negatively associated with teacher burnout in a systematic review (Madigan & Kim, 2021).

Based on a previous systematic review, findings show that different conceptualizations of EI and specific emotional skills measured by different EI tests are related to lower burnout symptoms (Mérida-López & Extremera, 2017). Theoretically, EI could render teachers less vulnerable to burnout because those with enhanced EI might more effectively use emotional information to make sense of their reactions to stressors and to guide adaptive actions (Greenberg, 2002). Empirical research has also reported negative connections between teachers'

EI and teacher burnout (Brackett et al., 2010; Chan, 2006). In addition, evidence from professional training programs suggests that EI training can be an effective technique for improving individual stress resilience, which may be particularly helpful in combating teacher burnout (Brackett & Katulak, 2006).

Methods

The purpose of our study is to examine the magnitude of the relationship between teachers' EI, self-efficacy, and burnout. Establishing these empirical links: (a) builds our understanding of how teachers' EI may influence teacher self-efficacy and burnout, (b) paves the way for improving teacher self-efficacy and burnout. Our study poses four research hypothesizes:

Hypothesis 1: As a set, collectively, all three EI streams are significantly and positively correlated with teacher self-efficacy.

Hypothesis 2: Individually, each of three EI stream is significantly and positively correlated with teacher self-efficacy.

Hypothesis 3: As a set, collectively, all three EI streams are significantly and negatively correlated with teacher burnout.

Hypothesis 4: Individually, each of three EI stream is significantly and negatively correlated with teacher burnout.

Literature Search

The systematic literature search to identify empirical research related to teachers' EI, self-efficacy and burnout was conducted in two steps: First, I searched peer-reviewed and non-reviewed studies using electronic databases, such as ABI/Inform, Scopus, EBSCO Host (APA PsycInfo, ERIC, Education Research Complete), JSTOR, and ProQuest Dissertations and Thesis.

I searched using a list of keywords in various combinations, such as teacher emotional intelligence, teacher self-efficacy, teacher efficacy, teacher burnout, teacher social-emotional competence, and teacher emotional ability. The range of dates was set from the earliest date of each database to the year 2022. The search was limited to English language studies. Second, I reviewed the reference lists of all studies identified to locate additional studies after the database search. This helped to identify more articles that could potentially be included in the study. To reduce publication bias, non-reviewed studies such as unpublished dissertations were also searched in addition to published peer-reviewed studies.

I completed the search in June 2022. The electronic search resulted in a total of 2040 abstracts and 12 additional studies. In the first step, I excluded 990 duplicated records. Then I reviewed the studies' abstracts to excluded 809 studies, which were not applicable to the current meta-analysis, such as theoretical discussion articles and studies not related to our key words. I also excluded studies reporting relationships not associated with my research hypotheses. This process led to 253 studies that were further examined by full text. The flow diagram (Figure 2) illustrates the process through different phases.

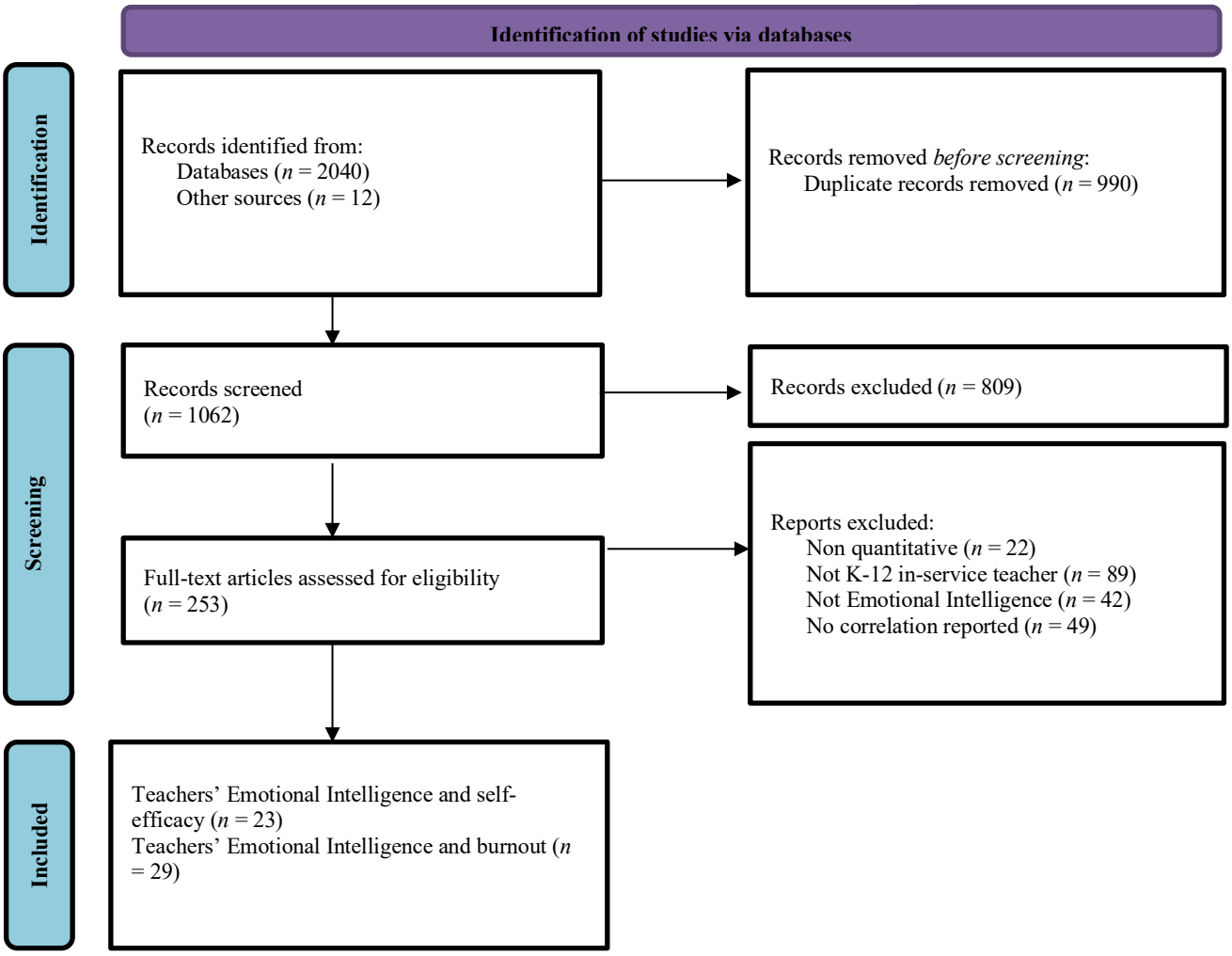
Inclusion Criteria

I examined the remaining 253 studies by reading the full texts and decided whether a study was deemed eligible for inclusion in the present meta-analysis. It was included if it met the following criteria. First, primary studies had to be empirical and quantitative. All qualitative studies were excluded. Second, primary studies had to use in-service teacher samples in their research design. Studies based on pre-service teachers or student teachers were eliminated from the meta-analysis. Third, the study had to use scales designed to measure EI. Studies that used proxy measures of EI (e.g., self-monitoring scales) were not eligible. Fourth, primary studies had

to report the correlation coefficients for the relationships between teachers' EI and self-efficacy or teachers' EI and burnout. The final sample consisted of 23 studies relating teachers' EI to teacher self-efficacy and 29 studies relating teachers' EI to teacher burnout. There is one study reported effects for both relationships (Barari & Barari, 2015).

Figure 2

Flow Diagram of Exclusion of Studies



Coding Procedures

Each of the selected studies was coded for years of publication, sample size, stream of EI measure, and magnitude of the relationship between teachers' EI and self-efficacy or teachers' EI and burnout. I coded different streams of EI based on Ashkanasy and Daus's (2005) suggestions,

who identified three streams of EI research: A four-branch abilities test based on the model of emotional intelligence defined in Mayer and Salovey (1997); self-report instruments based on the Mayer-Salovey model; and commercially available tests that go beyond the Mayer-Salovey definition. The category of self-efficacy included measures labeled as teacher self-efficacy or teacher efficacy. The category of burnout included measures labeled as burnout or teacher burnout.

Meta-Analytic Procedure

I applied Hunter and Schmidt's (2004) approach for this meta-analysis. An R package called psychmeta (Dahlke & Wiernik, 2019) was used. When multiple correlation coefficients were presented within one study (e.g., multiple effect sizes between teacher s' EI and multiple aspects of teacher self-efficacy), the effect size was calculated by averaging the individual Fisher's z scores and then transforming the mean back to Pearson *r* coefficients. These transformed Pearson *r* coefficients were then used to calculate the final effect sizes for the meta-analysis. This avoided including multiple effect sizes from the same study which violates the assumptions of independence and underestimates the sampling error variance in the observed variance of effect sizes (Lipsey & Wilson, 2001).

Since effect size estimates could be biased due to measurement error, I corrected measurement errors in teachers' EI, self-efficacy, and burnout for each individual correlation. For included studies that did not report the reliability, I imputed the missing reliability for teachers' EI, self-efficacy, and burnout by using the means of reliabilities of the studies that reported reliability for the measures used (Hunter & Schmidt, 2004). The estimate of population mean correction are presented as corrected sample-size-weighted mean correlation, and 95% confidence intervals are used to determine the statistical significance of effect sizes, which

means effect sizes are considered to be statistically significant when corrected 95% confidence intervals do not contain 0. Given that the measure and definition of EI varied across studies, the population effect parameters may be different, a more conservative random effects statistical model that assumes heterogeneity of effects was conducted. Meanwhile, small sample bias and sample weighted were corrected.

Results

Descriptive Statistics

A summary of included studies about teacher self-efficacy is reported in Table 1 and teacher burnout is reported in Table 2. For teacher self-efficacy (Table 1), the majority of the studies (83%, $N = 19$) were published as journal articles, with 13% ($N = 3$) doctoral dissertation and one published as a book chapter. Studies were conducted in a range of different countries: Israel (4), U.S. (3), China (2), Iran (2), Romania (2), Australia (1), Belgium (1), Egypt (1), Ethiopia (1), Greece (1), Italy (1), Jordan (1), Nigeria (1), Oman (1), Portugal (1). The sample sizes ranged from 43 to 1240, $M = 314.7$, $SD = 263.66$.

For teacher burnout (Table 2), similar to included studies related to teacher self-efficacy, the majority of the studies (76%, $N = 22$) were published as journal articles, with 21% ($N = 6$) doctoral dissertation and one published as a conference report. Studies were conducted in a range of different countries. Six studies were conducted in Iran, with the remaining studies conducted in U.S. (5), Spain (4), China (2), India (2), Italy (2), Canada (1), Greece (1), Israel (1), Jordan (1), Malaysia (1), Nigeria (1), Romania (1), Turkey (1). The sample sizes ranged from 30 to 990, $M = 269.2$, $SD = 219.7$.

Table 1

Summary of Included Studies Related to Teacher Self-Efficacy

Author	Year	*n*	EI measure	Country	Type	EI category	*r*
Agbaria	2021	337	EIQ	Israel	Journal article	Stream 3	0.53
Akomolafe & Ogunmakin	2014	398	AES	Nigeria	Journal article	Stream 2	0.37
Al-Adwan & Al-Khayat	2016	70	AES	Jordan	Journal article	Stream 2	0.9
Alrajhi et al.	2017	1240	AES	Oman	Journal article	Stream 2	0.35
Barari & Barari	2015	221	AES	Iran	Journal article	Stream 2	0.49
A. Cohen & Abedallah	2015	221	AES	Israel	Journal article	Stream 2	0.76
Colomeischi & Colomeischi	2014	575	AES	Romania	Journal article	Stream 2	0.44
Eissa & El Said Khalifa	2008	178	AES	Egypt	Book chapter	Stream 2	0.32
Fabio & Palazzeschi	2008	169	EQ-i:S	Italy	Journal article	Stream 3	0.39
Goroshit & Hen	2014	273	ESE	Israel	Journal article	Stream 2	0.53
Hen & Goroshit	2016	312	ESE	Israel	Journal article	Stream 2	0.37
Kang	2017	586	RTS	U.S.	Dissertation	Stream 1	0.19
Mouton et al.	2013	119	TEIQue	Belgium	Journal article	Stream 3	0.28
Okech	2004	180	MEIS	U.S.	Dissertation	Stream 1	0.87
Penrose et al.	2007	221	RTS	Australia	Journal article	Stream 1	0.38
Pfleging	2021	140	TEIQue	U.S.	Dissertation	Stream 3	0.48
Poulou	2017a	98	AES	Greece	Journal article	Stream 2	0.56
Răducu & Stănculescu	2021	330	TEIQue-ASF	Romania	Journal article	Stream 3	0.65
Rastegar & Memarpour	2009	72	AES	Iran	Journal article	Stream 2	0.5
Valente et al.	2020	634	ESCQ-T	Portugal	Journal article	Stream 2	0.13
L. Wang	2021	365	WLEIS	China	Journal article	Stream 2	0.24
Wossenie	2014	43	EIQ	Ethiopia	Journal article	Stream 2	0.26
Wu et al.	2019	467	MSTECS	China	Journal article	Stream 3	0.42

Note. AES = Assessing Emotions Scale (Schutte et al., 1998); EIQ = Emotional Intelligence Questionnaire (Al-Uqayshi, 2004; Smith, n.d.); EQ-i:S = Bar-On Emotional Quotient Inventory: Short (Bar-On, 2002); ESCQ-T = Emotional Skills and Competence Questionnaire for Teachers (Valente & Lourenço, 2020); ESE = Emotional Self-efficacy Questionnaire (Kirk et al., 2008); MEIS = Multi-factor Emotional Intelligence Scale (Mayer et al., 1999); MSTECS = Middle School Teachers' Emotional Competence Scale (Wu, 2013); RTS = Reactions to Teaching Situations (Perry et al., 2004); Stream 1 = ability EI; Stream 2 = self-report EI; Stream 3 = mixed EI; TEIQue-ASF = Trait Emotional Intelligence Questionnaire—Short Form for Adults (Petrides et al., 2006); TEIQue = Trait Emotional Intelligence Questionnaire (Petrides, 2009); WLEIS = Wong and Law's Emotional Intelligence Scale (Wong & Law, 2002)

Table 2

Summary of Included Studies Related to Teacher Burnout

Author	Year	*n*	EI measure	Country	Type	EI category	*r*
Adilogullari et al.	2014	563	AES	Turkey	Journal article	Stream 2	-0.28
Akomolafe & Popoola	2011	300	AES	Nigeria	Journal article	Stream 2	-0.16
Al-Bawaliz et al.	2015	100	EII	Jordan	Journal article	Stream 3	-0.11
Alavinia & Ahmadzadeh	2012	75	EQ-i	Iran	Journal article	Stream 3	-0.69
Augusto-Landa et al.	2012	251	TMMS-24	Spain	Journal article	Stream 3	-0.04
Barari & Barari	2015	221	AES	Iran	Journal article	Stream 2	-0.32
Batista	2018	97	MSCEIT	U.S.	Dissertation	Stream 1	0.16
Chakravorty & Singh	2020	713	WLELS	India	Journal article	Stream 2	-0.40
A. Cohen & Abedallah	2015	221	AES	Israel	Journal article	Stream 2	-0.50
Colomeischi	2015	575	AES	Romania	Conference	Stream 2	-0.23
D'Amico et al.	2020	238	WLEIS	Italy	Journal article	Stream 2	-0.41
D'Olympia	2019	190	TEIQue	U.S.	Dissertation	Stream 3	-0.31
De Vito	2009	64	EQ-i:S	U.S.	Dissertation	Stream 3	-0.21
Esmaili et al.	2018	63	EQ-i	Iran	Journal article	Stream 3	-0.58
Fiorilli et al.	2019	318	TEIQue-ASF	Italy	Journal article	Stream 3	-0.55
Hammett	2013	100	EQ-i	U.S.	Dissertation	Stream 3	-0.32
Ju et al.	2015	307	WLEIS	China	Journal article	Stream 2	-0.25
Kant & Shanker	2021	200	WEIT	India	Journal article	Stream 3	-0.22
Kia & Heidari	2014	200	SYQEI	Iran	Journal article	Stream 3	-0.31
Mendes	2002	49	MEIS	U.S.	Dissertation	Stream 1	-0.02
Platsidou	2010	123	AES	Greece	Journal article	Stream 2	-0.30
Pyne	2017	309	TEIQue	Canada	Dissertation	Stream 3	-0.51
Rey et al.	2016	489	WLEIS	Spain	Journal article	Stream 2	-0.42
Saiiari et al.	2011	183	SYQEI	Iran	Journal article	Stream 3	-0.63
Sánchez-Pujalte et al.	2021	430	TMMS-24	Spain	Journal article	Stream 3	-0.21
Schoeps et al.	2021	200	TMMS-24	Spain	Journal article	Stream 3	-0.19
Shami et al.	2017	208	EQ-i	Iran	Journal article	Stream 3	-0.23
Thomas et al.	2012	30	TEIQue	Malaysia	Journal article	Stream 3	-0.24
Tian et al.	2022	990	TSC	China	Journal article	Stream 3	-0.48

Note. AES = Assessing Emotions Scale(Schutte et al., 1998); EII = Emotional Intelligence Inventory (Al-Rabee, 2007); EIT = Weisinger's Emotional Intelligence Test (Weisinger, 1998); EQ-i= Bar-On Emotional Quotient Inventory (Bar-On, 2004); EQ-i:S = Bar-On Emotional Quotient Inventory: Short (Bar-On, 2004); MEIS = Multi-factor Emotional Intelligence Scale (Mayer et al., 1999); MSCEIT = Mayer–Salovey- Caruso emotional intelligence test (Mayer et al., 2002); Stream 1 = ability EI; Stream 2 = self-report EI; Stream 3 = mixed EI; SYQ = Syber Yashring questionnaire for emotional intelligence (Mansouri, 2001); TEIQue-ASF = Trait Emotional Intelligence Questionnaire—Short Form for Adults (Petrides, 2009); TEIQue = The Trait Emotional Intelligence (Petrides, 2009); TMMS-24 = Trait Meta Mood Scale (Salovey et al., 1995); TSC = Teachers' Social-Emotional Competence (Li, 2019); WLELS = Wong and Law's Emotional Intelligence Scale (Wong & Law, 2002)

Overall Effects

Table 3 provides the results of the meta-analysis between EI and teacher self-efficacy as well as the relations between each EI stream and teacher self-efficacy. These data supported Hypothesis 1 that there is a positive and significant relationship between teachers' EI and teacher self-efficacy ($r = .396$, $p < .05$). This significant relationship was also captured by the fact that the range of 95% confidence intervals for average population mean effect size estimates was above zero. Similarly, all three different streams, except for EI Stream 1, were significantly correlated, with the greatest effect sizes for Stream 3 ($r = .484$, $p < .05$), and followed by Stream 2 ($r = .375$, $p < .05$). Thus, the results were in support of Hypothesis 1, but only partially of Hypothesis 2.

Q tests of homogeneity and I^2 were used to determine whether the variance in population effect sizes was different from zero for all streams' measures. Regarding the presence of heterogeneity between effect sizes, the Q-statistic (or Cochrane's Q) was significant for all Steams Q (22) = 304.047, $p < .001$. However, the Q test has low power in the case of small sample size meta-analysis. As a complement, the I^2 statistic estimates how much of the total variability in the effect size estimates, which is composed of heterogeneity and sampling variability, can be attributed to heterogeneity among the true effects (Higgins & Thompson, 2002). In the current study, I^2 was reported as 92.76%, indicating that a substantial proportion of the estimated variation in our data stems from true effect size differences (Higgins & Thompson, 2002). Both statistics are presumably representing estimates drawn from multiple populations. Because there are noteworthy variances in the effect sizes for Stream 1, Stream 2, and Stream 3 studies, a further examination of what sample or study characteristics might best explain that variability is recommended.

Table 3

Results for Meta-Analysis Related to Teachers' EI and Teacher Self-Efficacy

EI	*k*	*n*	Corrected effect size	Corrected *SD* of correlations	95% Credibility interval
All Streams	23	7239	0.396	0.171	0.319; 0.472
Stream 1	3	977	0.354	0.313	-0.424; 1.13
Stream 2	14	4700	0.375	0.165	0.279; 0.47
Stream 3	6	1562	0.484	0.118	0.36; 0.608

Note. EI = emotional intelligence; Stream 1 = ability EI; Stream 2 = self-report EI; Stream 3 = mixed EI

As seen in Table 4, these data supported Hypothesis 3 that there is a negative and significant relationship between teachers' EI and teacher burnout (r = -.337, p <.05). Two of the three different streams, excluding EI Stream 1(N = 3), were significantly correlated with the greatest effect sizes for Stream 3 (r = -.37, p <.05), followed by Stream 2 (r = -.319, p <.05). *Overview of Three Studies* Thus, the results were in support of Hypothesis 3, but only partially for Hypothesis 4.

Table 4

Results for Meta-Analysis Related to Teachers' EI and Teacher Burnout

EI	k	n	Corrected effect size	Corrected *SD* of correlations	95% Credibility interval
All Streams	29	7807	-0.337	0.155	-0.396; -0.278
Stream 1	2	146	0.099	0.117	-0.948; 1.15
Stream 2	10	3750	-0.319	0.098	-0.389; -0.25
Stream 3	17	3911	-0.37	0.177	-0.461; -0.28

Note. EI = emotional intelligence; stream 1 = ability EI; stream 2 = self-report EI; stream 3 = mixed EI

For heterogeneity of the effects for all steams' measures, the Q-test is significant Q (28) = 229.823, p <.001 with high heterogeneity coefficients I^2 (87.8%) (or Cochrane's Q), indicating there is a high degree of true between-study heterogeneity. Using Higgins and Thompson's (2002) "rule of thumb," this amount of heterogeneity could be considered as large. Similar to the meta-analysis of teacher self-efficacy, those statistics indicated the suitability of a further moderator analyses to discern an explanation for that variability. However, it is important to note

that I^2 is often estimated imprecisely, and the Cochran's Q increases both when the number of studies increases, and when the precision (e.g., the sample size of a study) increases (Harrer et al., 2021).

Publication Bias

Publication bias has been defined as "the possibility that not all completed studies on a topic are published in the literature and that these studies are systematically different from published studies" (McDaniel et al., 2006, p. 927). Publication bias refers to many reporting biases including citation bias, time-lag bias, multiple publication bias, language bias, and outcome reporting bias (Harrer et al., 2021). A funnel plot refers to a scatter plot of the included studies' observed effect sizes on the x-axis against a measure of their standard error on the y-axis. If there is no publication bias, the data points in such a plot should form a roughly symmetrical, upside-down funnel (Harrer et al., 2021). In the current study, I used funnel plot to distinguish publication bias from other forms of asymmetry by signifying the significance level of each study in the plot. The vertical line in the middle of the funnel shows the average effect size. It generally leads to an overestimation of effect sizes, posing a great challenge to the validity of meta-analytic reviews (Banks et al., 2012; McDaniel et al., 2006).

I assessed publication bias in two ways. First, I produced a funnel plot to provide a visual indicator of publication bias. The dotted lines represent the 99% confidence interval, and the dashed lines represent 95% confidence interval. Effect sizes falling into these two confidence intervals are traditionally considered significant. Figure 3 shows the resulting funnel plot shows the effect size of studies related to teachers' EI and self-efficacy. The plot roughly follows the shape delineated by the funnel displayed in the plot but a little asymmetrically upside-down. This might be caused mainly by one small study with very high effect sizes in the bottom-right corner

of the plot, because low-quality studies tend to show larger effect sizes with a higher risk of bias even when there is no publication bias. In addition, this asymmetric could also be influenced by large between-study heterogeneity since funnel plots assume that the dispersion of effect sizes is caused by the studies' sampling error, but do not control for the fact the studies may be estimators of different true effects (Harrer et al., 2021).

Figure 3

Funnel Plots of Studies About Teachers' EI and Self-Efficacy

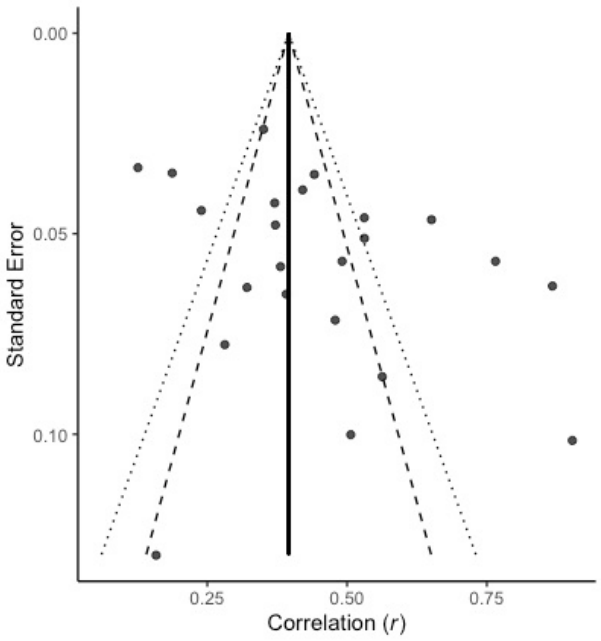
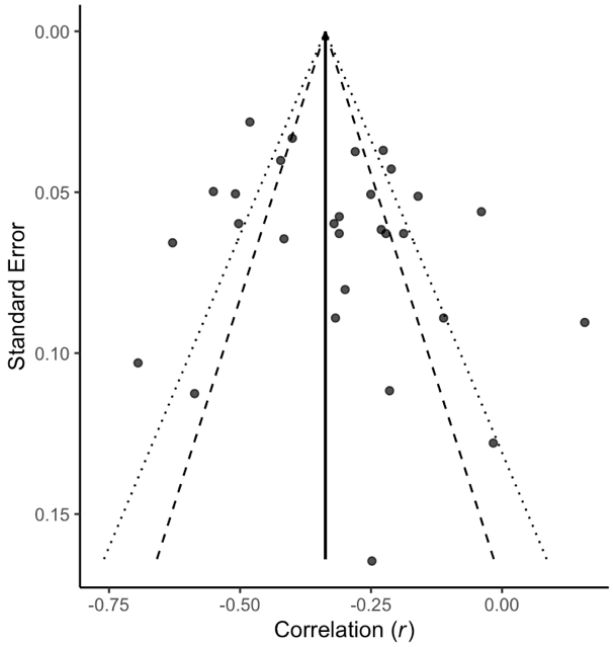


Figure 4 shows the resulting funnel plot shows the effect size of studies related to teachers' EI and burnout. The plot shows a roughly symmetrical, upside-down funnel following the shape. Effect sizes scatter more to the left and right of the pooled effect. Both evidences indicate that publication bias may not be a factor in this meta-analysis.

Figure 4

Funnel Plots of Studies About Teachers' EI and Burnout



Second, I used Egger's regression test (Egger et al. 1997) to test for asymmetry in the funnel plot using quantitative methods. Publication bias is present when the intercept of the regression line is statistically significant (Borenstein et al., 2009a; Kepes et al., 2012). Since the current study used correlation coefficients as effect sizes rather than Cohen's *d*, I transferred all correlation coefficients into Cohen's *d* to conduct Egger's regression (Borenstein et al., 2009b). For teachers' EI and teacher self-efficacy studies, the results show a significant Egger's regression test with a small intercept estimate of 2.61, $p < 0.05$, which indicates that the data in the funnel plot is indeed asymmetrical. Overall, this corroborates the initial findings from the funnel plot that there are small-study effects. Yet, to reiterate, it is uncertain if this pattern has been caused by publication bias. For teachers' EI and teacher burnout studies, the Egger's test reported a non-significant result with an intercept estimate of 3.44. Thus, publication bias did not appear to be a big issue.

Discussion

To echo the increasing attention on the importance of teachers' EI, various empirical studies have been conducted to explore the associations among teachers' EI, teacher self-efficacy, and teacher burnout (e.g., Al-Adwan & Al-Khayat, 2016; Alrajhi et al., 2017; Fabio & Palazzeschi, 2008). However, there is a lack of meta-analyses focused on establishing the accurate estimates of different effect sizes. Accordingly, in this review I set out to develop a more helpful estimate of the effect magnitude among teachers' EI, self-efficacy, and burnout to better understand teachers' EI.

There are three major findings of the current review. First, teachers' EI indeed has important links with teacher self-efficacy, especially in both Stream 2 measures (self-report EI) and Stream 3 measures (mixed EI). These findings align with current literature that teachers' EI plays vital role in teachers' professional lives. Teachers with higher levels of EI may feel more confident about their teaching capabilities to bring about desired outcomes of student engagement and learning. Teachers' self-efficacy has proven to be powerfully related to many meaningful educational outcomes such as teacher performance (Klassen & Tze, 2014), as well as student outcomes such as achievement, motivation, and self-efficacy beliefs (Zee & Koomen, 2016).

Second, regarding teacher burnout, the findings exhibited substantial relative importance in the presence of teachers' EI from Stream 2 measures and Stream 3 measures. Thus, emotionally intelligent teachers also can better master their stress and burnout. It indicates the important impact of teachers' EI on teacher well-being, job performance, and job commitment, as well as a likelihood of decreased attrition (Herman et al., 2018; McLean et al., 2019; Skaalvik & Skaalvik, 2017). Thus, it is recommended that educational institutions and researchers should

develop curricula for pre-service teachers to enhance their EI skills to better prepare them for future work. Also, policy makers and stakeholders should provide training programs for in-service teachers and, in turn, might improve their self-efficacy beliefs and decrease teacher burnout, especially after the current pandemic. Some programs already show evidence of improving teachers' EI by training (Hansen et al., 2007; Iancu et al., 2018).

Third, contrary to expectation, Stream 1 measures, or ability EI measures, have not shown a significant association with teacher self-efficacy and teacher burnout. This result could be biased due to the very limited included sample (k = 3/2). Because from other meta-analyses with larger sample sizes, three streams of EI models perform equally well with factors like job performance (e.g., Miao et al., 2017; O'Boyle et al., 2011). This finding also shows the concerns about the reliability of Stream 1 measures. Although the Multi-factor Emotional Intelligence Scale (Mayer et al., 1999) has frequently been applied in the education field, in the current study, Stream 2 and Stream 3 reported more consistent results than Stream 1 measures in a cross-cultural context. Hence, schools or other institutions with a more diverse culture environment, Stream 2 and Stream 3 measures may be a better choice to assess teachers' EI.

However, these findings need to be interpreted with cautions. First, though in the data there is a substantial proportion of the estimated variation stemming from true effect size differences in both relationships, the large between-study homogeneities have been identified in both relationships: teachers' EI and teacher self-efficacy as well as teachers' EI and teacher burnout. This difference could be caused by different measures to assess teachers' EI, self-efficacy, and burnout that were applied in the included studies. The cultural differences might also be part of the reasons since the included studies have been conducted in a range of countries. Some studies used translated measure without conducting validation test may lead to the

differences. To best identify what sample or study characteristics might lead to this variability, a future examination with larger sample sizes is recommended when there are more studies available in the field. It leads to a promising direction in the future studies to explore what causes this heterogeneity with more sufficient research being conducted. Second, the result from the meta-analysis about the relationship between teachers' EI and teacher self-efficacy should be approached with caution due to the potential publication bias. In the current study, potential indicators of publication bias have been found like the asymmetry in the funnel plot. However, the asymmetry could also be caused by large between-study heterogeneity. Most methods to estimate the true effect size corrected for publication bias are not appropriate when there is a large between-study heterogeneity (van Aert et al., 2016). Hopefully as the research literature grows and more interests are raised, future meta-analyses could include more studies to reduce the potential of publication bias. Third, like all meta-analyses, the coding and selection are influenced by the decision-making of the researcher. Since I chose to limit the search to studies written or published in English, results published in other languages were therefore excluded. It is suggested that future meta-analysis study could include articles published in other languages. Fourth, the present meta-analytic review was dominated by the studies using cross-sectional design. Future studies could conduct more longitudinal designed studies and advanced analyses, such as latent growth modelling (Bliese & Ployhart, 2002), to draw robust causal inferences. Fifth, the current study has focused only on estimating the pooled correlation coefficients related to teachers' EI, teacher self-efficacy, and teacher burnout. Future studies might conduct meta-regression to examine the predictive role of teachers' EI when more studies are available.

Summary

Understanding teachers' EI through associations with teacher self-efficacy and teacher burnout can not only confirm the importance of teachers' EI but also help the development of measures to assess teachers' EI. In addition, since teacher self-efficacy has often been considered as a characteristic of teacher effectiveness, it is safe to say that teachers' EI has the potential to facilitate effective teaching (S. Huang et al., 2013; Klassen & Tze, 2014; Valenta, 2010). Teachers with higher EI reported an ability to interact with students in ways that extend individualized learning opportunities (Perry & Ball, 2005) and overall greater effectiveness (Akram et al., 2019; Penrose et al., 2007; Taseer, 2020). In a multicultural and diverse environment, teachers' EI is even more critical, because teachers need to adapt their teaching to a vast array of emotional, cultural, and learning needs, and to find a way to include all students in the educational milieu (McAllister & Irvine, 2000). Similarly, teachers' EI holds promise as a means through which teacher burnout may be mitigated while supporting personal and professional well-being. Indeed, teachers' EI has been linked to higher levels of well-being (e.g., Colomeischi, 2015; He, 2011; Pishghadam & Sahebjam, 2012; Saiiari et al., 2011; C. Wang, 2013; Zysberg et al., 2017). The research evidence suggests that teachers' EI is critical in contributing to the prevention of teacher burnout while improving a teacher's well-being.

The field of teachers' EI is expanding, and the potential implications of such research are exciting. The current study aimed to summarize the current research that has examined teachers' EI in relation to its effect on teacher self-efficacy and burnout. To have a more accurate understand about these relationships, more research is necessary and recommended. Future academic endeavors in the area of teachers' EI would be helpful to extend current findings.

CHAPTER 3: Capturing Teachers' Emotional Intelligence: Developing a New Measure

Teaching involves both meaningful work and experiences of joy, while at the same time it can be challenging due to the complex nature of the job and the myriad demands placed upon teachers. Especially during the pandemic, how to sustain teacher well-being and teacher effectiveness in such a stressful situation has been among core topics explored by researchers and, in some cases, the findings have been quite concerning (Jotkoff, 2022; Steiner & Woo, 2021). Fortunately, according to research conducted prior to the pandemic, teachers' emotional intelligence (EI) has been found to play an important role in teachers' well-being (Colomeischi, 2015; He, 2011; Pishghadam, & Sahebjam, 2012; Saiiari et al., 2011; C. Wang, 2013; Zysberg et al., 2017). Further, studies also reported that the higher teachers' EI, the higher level of teachers' effectiveness (Akram et al., 2019; Taseer, 2020), as well as student achievement (Curci et al., 2014; Nizielski et al., 2012). It is also vital to recognize that teachers are the engines that drive Social Emotional Learning (SEL) programs and practices as well as playing a central role in impacting students' cognitive and social-emotional development (Phelps & Benson, 2012). In fact, teachers' EI plays an important role in individual behavior differences in the implementation of SEL, such as recognizing and managing emotions, developing care and concern for others, and coping effectively with confrontations. Thus, teachers not only need to have knowledge of how to teach SEL, but they should also cultivate their own EI to create a supportive learning environment (Jones & Bouffard, 2012). As a result of these trends, there has been increasing interest in teachers' EI in the extant research. However, research to explore how to best assess teachers' EI has been limited. Without a more accurate assessment of teachers' EI, it will be hard to improve it, even though research affirms its importance.

There are many concerns with existing measures of EI. EI has been explored and defined from a variety of theoretical perspectives, and there are disagreements in the literature about the validity and reliability of different measures with respect to the instrument designs. In addition, researchers have found that many measures reveal a different structure from the theoretical framework in factor analyses. This also has resulted in confusion and debate about the structure of EI. Further, though EI in general is a popular topic in the academia, there has been limited attention paid to the EI of teachers.

Hence, the purpose of this paper is to explore issues related to the measurement of teachers' EI and to propose a new measure. First, I examined various instruments that have been used to assess EI as well as the problems that have arisen. Next, I introduced a new measure of teachers' EI based on a revised model of Mayer and Salovey (1997, Mayor et al., 2016), along with reliability and validity data from two studies. Finally, I propose new directions for research in light of the new measure.

Literature Review

EI Models and Measures

Researchers have developed various models and instruments for measuring EI aligned with different definitions of EI (O'Connor et al., 2019). These models can be grouped into three main streams: the four-branch ability models that conceptualize EI as abilities that can be learned with training (Mayer & Salovey, 1997; Mayer et al., 2016); models of EI that encompass various self- and peer-reports based on Mayer-Salovey's representation (Schutte et al., 1998); and mixed models that comprise expanded models of emotional intelligence and encompass components not included in Salovey and Mayer's definition (e.g., Bar-On, 1997; Goleman, 1995; Petrides et al., 2016). Following is a brief introduction of each stream and corresponding EI measures.

Stream 1: Ability EI Models and Instruments. The ability EI model is currently the most widely accepted EI model in the world. In the 1990s, Salovey and Mayer developed the concept of EI to differentiate between the social and emotional components which contribute to a person's ability to successfully function in life in the United States. According to Mayer and Salovey (1997), El is "the ability to monitor one's own and others' feelings and emotions, to discriminate among them and to use this information to guide one's thinking and actions" (p. 189). In addition, Mayer et al. (2016) claimed that EI was a measurable mental ability and a member of the class of broad intelligences. In other words, EI involves reasoning with information of significance to an individual because emotions are organized responses involving physical changes, felt experiences, cognitions, and action plans—all with strong evaluative components (Izard, 2010). Therefore, this model is recognized as an ability model that emphasizes the interaction of emotion and thought in meaningful and adaptive ways (Mayer et al., 2016).

To better understand the development of EI, Mayer et al. (1997, 2016) proposed and revised a Four Branches Model that identifies a hierarchical structure starting from simple abilities of perceiving emotions to conscious reflective regulation of emotion. The first branch at the base, *Perceiving Emotion*, recognizes and inputs verbal and nonverbal information from the emotion system; the second branch, *Facilitating Thoughts Using Emotion* refers to using emotions as part of cognitive processes such as creativity and problem-solving; the third branch, *Understanding Emotions,* involves cognitive processing of emotion, that is, insight and knowledge brought to bear upon one's feelings or the feelings of others; the fourth branch, *Managing Emotions*, concerns the regulation of emotions in oneself and other people.

Building on the Four Branches Model, Mayer et al. (2002) developed their EI measure: Mayer, Salovey, Caruso Emotional Intelligence Test (MSCEIT). It is the only well-known performance-based instrument that measures EI in a manner similar to traditional intelligence testing, such as IQ tests (Matthews et al., 2004). In the MSCEIT, tasks like *Faces and Pictures for Perceiving emotions*, *Facilitation and Sensations for Using emotions*, *Changes and Blends for Understanding emotions*, and *Management and Relations for Managing emotions* are used. Like other traditional intelligence tests, MSCEIT has a strict standard to define right or wrong answers. Scores are computed through two scoring options: General Consensus and Expert Consensus (Mayer et al., 2002). The General Consensus option compares individual responses to the responses of the whole. Responses that more closely match the responses of the normative sample are awarded a higher point value. The Expert Consensus scoring criteria is similar to the General Consensus approach, but instead of using the normative sample, a panel of 21 emotions experts determine the scores associated with the response options for each item.

MSCEIT is often criticized, however, based on its scoring system, mismatches between the test items and EI theory, and a lack of reliability. First, the MSCEIT's General Consensus and Expert Consensus have drawn considerable controversy (Maul, 2012). A concern is that MSCEIT's scoring system may lead to bias due to cultural differences. This consensus-based scoring was built upon the assumption that most people's emotional reactions could help define the general meaning of EI. However, emotions are not defined solely by a group of people's reactions. It can vary from culture to culture (Ekermans, 2009; Huynh et al., 2018). If consensus does not itself define correctness, the instrument's validity is undermined (Zeidner et al., 2001). Second, there are mismatches between the MSCEIT test items and the theory of EI and its revised version, MSCEIT V2 (Gignac, 2005; Palmer et al., 2005; Rossen et al., 2008). Mayer et

al. (2002) defined the *Facilitation and Sensations for Using emotions* as "the ability to generate, use, and feel emotion as necessary to communicate feelings, or employ them in other cognitive processes" (p. 7), and noted that it involves "being able to use one's emotions to help a person solve problems creatively" (p. 19). However, in the MSCEIT, none of these abilities appear to be directly assessed (Maul, 2012). Also, within a validity study of an EI instrument, the component abilities demonstrate unexpected relationships with one another and align with the constructs and outcomes predicted by theory (Maul, 2012). Yet, several studies have examined the internal structure of the MSCEIT to test whether the test conforms to the Four Branches Model (e.g., Curci et al., 2014; Keele & Bell, 2009; Maul, 2011). These studies employing different analytic approaches reached similar conclusions, that a *Using Emotions* branch could generally not be identified apart from a general factor. Lastly, the MSCEIT also struggles to achieve even minimum standards of reliability for exploratory research (Matthews et al., 2002). In the previous chapter, Stream 1 EI measures also reported inconsistent findings about relationships between teacher self-efficacy, teacher burnout, and its scores in meta-analyses.

Stream 2: Self-report EI Models and Instruments. Several researchers around the world have developed EI instruments based on the Four Branches Model assessing EI with self-report instead of traditional intelligence (e.g., MacCann & Roberts, 2008; Schutte et al., 1998). Among these instruments, the Assessing Emotions Scale (AES) is a widely applied one. AES was developed by Schutte and colleagues (1998) and is also known as the Emotional Intelligence Scale, the Self-Report Emotional Intelligence Test, or the Schutte Emotional Intelligence Scale. AES is a 33-item self-report inventory. Items composing the subscales include *Perception of Emotion*, *Managing Own Emotions*, *Managing Others' Emotions*, and *Utilization of Emotion*.

However, E. J. Austin et al. (2004) found the AES items grouped into just three factors instead of announced four factors in the factor analysis.

To assess EI among Asian population, Wong and Law (2002) developed a self-report EI scale called the Wong and Law Emotional Intelligence Scale (WLEIS). This EI scale is based on Davies et al.'s (1998) four-dimensional definition of EI that adheres to Mayer et al.'s (2002) Four Branches Model. The WLEIS consists of four subscales and 64 items. The *Self Emotion Appraisal* assesses individuals' ability to understand and express their own emotions. The *Others' Emotion Appraisal* measures individuals' ability to perceive and understand the emotions of others. The *Use of Emotion* denotes individuals' ability to use their emotions effectively by directing them toward constructive activities and personal performance. The *Regulation of Emotion* refers to individuals' ability to manage their own emotions (Wong & Law, 2002). Compared to Stream 1 EI measures (e.g., MSCEIT), Stream 2 EI measures like AES and WLEIS have better validity and reliability, but neither are developed based on teachers' professional settings.

Stream 3: Mixed Models and Instruments. In contrast to the ability model, Mayer et al. (2000a, 2000b) characterized the Stream 3 models as "mixed," because they are comprised of a mixture of personality-type items and behavioral preferences. For instance, the trait model defined EI as "a constellation of emotion-related self-perceptions and dispositions assessed through self-report questionnaires" (Petrides & Furnham 2006, p. 554). Namely, trait models reflect characteristics or preferred behavior patterns rather than skills or efficiency of performance output (Schulze et al., 2005). Bar-On (2006) believed that EI was a set of noncognitive abilities and expanded the definition of EI as social-emotional intelligence, which was defined as "a cross-section of interrelated emotional and social competencies, skills and

facilitators that determine how effectively we understand and express ourselves, understand others and relate with them and cope with daily demands" (p. 3). In fact, the Trait Emotional Intelligence Questionnaire (TEIQue; Petrides, 2001; Petrides & Furnham, 2006), Bar-On's (1997) Emotional Quotient Inventory (EQ-i) models and Goleman's (1998) Emotional and Social Competence Inventory (ESCI) include aspects of personality and social competence that go beyond the bounds of the original definitions given by Salovey and Mayer (1990) and Mayer and Salovey (1997). McRae (2000) illustrated that Stream 3 models of EI overlap with more traditional measures of personality. In the case of Bar-On's EQ-i, MacCann and colleagues (2003) cited empirical evidence to the contrary showing that the EQ-I was confounded with personality traits, including instruments such as the Sixteen Personality Factor Questionnaire (Cattell et al., 1970) and the Minnesota Multiphasic Personality Inventory (Butcher et al., 2001).

Moreover, Stream 3 scales were developed on a comprehensive model that often extended far beyond what Salovey and Mayer (1990) envisaged, which leads to issues of reliability and psychometric properties. Taking ESCI as an example. In this survey, 12 competencies are organized into four clusters: *Self-Awareness*, *Self-Management*, *Social Awareness*, and *Social Skills*. It purports to help managers and professionals create competitive advantages for their organizations by improving performance, innovation, and teamwork; ensuring effective time and resource usage; and building motivation and trust. Compared to the construct given by its originators, Goleman developed his initial broad conceptualization of EI into a comprehensive model of organization management and leadership structure. These characteristics of Stream 3 scales not only lead to public and commercial confusion of EI as a construct, but also result in issues in early empirical evaluations that focused on their reliability and psychometric properties (Boyatzis et al., 2000; Davies et al. 1998; Gignac, 2009; Saklofske

et al., 2003). A second example is Bar-On's model. Bar-On defined EI as a collection of interrelated competencies and dispositions. However, in a study applying EQ-I, factor analyses perform at the scale level have consistently found the 15 conceptual components to load on a single cohesive higher-order EI factor (Palmer et al., 2003). Namely, the inter-correlations among the subscales indeed attribute to a cohesive latent variable of EI rather than a collection of competencies that could be categorized as five different subscales. More recent research also reported similar findings (V. Austin et al., 2005; Brackett & Mayer, 2003; Gannon & Ranzijn, 2005; Warwick & Nettelbeck, 2004).

EI Models and Instruments for Teachers

Zeidner et al. (2004) noted that any career-relevant emotional intelligence measure should be one with demonstrated theoretical and empirical relevance to a particular occupational context. Yet, despite the essential role of teachers in schools, a limited number of EI instruments tailored for K-12 teachers have been found in the literature.

There are two instruments developed for teachers in the western context, and both adopt the method that measures teachers' reactions to specific situations. Based on the Four Branches Model of EI (Mayer & Salovey, 1997), the Reactions to Teaching Situations measure (RTS) was developed to assess teachers' EI (Perry & Ball, 2005; Stacey et al., 2004). It provides 10 vignettes of typical teaching situations and asks respondents how likely they are to respond in one of four ways, each corresponding to one of the four branches of emotional intelligence identified by Mayer and colleagues (Mayer & Salovey, 1997; Mayer et al., 2001). The 10 situations vary in emotional characters and portray emotional experiences as either positive or negative. In line with the Four Branches Model of EI (Mayer & Salovey, 1997), each of the four

possible reactions (identifying, using, understanding, and managing emotions) is rated as to the likelihood of that particular reaction being made.

Compared to RTS's rate format, Friedman (2014) developed a measure of EI for teachers called the Teacher Emotional Intelligence Measure, which uses open-ended responses to a hypothetical vignette of a classroom disciplinary interaction where EI might be presumed to operate. There are eight dimensions of EI from the teachers' written responses to the vignette:

> 1) perceive own emotions, 2) manage own emotions, 3) use thoughts to generate emotions, 4) perceive group's emotions, 5) manage group's emotions (i.e., students witnessing the disciplinary incident), 6) perceive disputant's emotions (i.e., students challenging the teacher), 7) understand disputant's emotions, and 8) manage disputant's emotions. (p. 32)

Yet, in the RTS and Teacher Emotional Intelligence Measure, several issues exist. First, in the Teacher Emotional Intelligence Measure, trained graduate students are used to score teachers' EI by coding based on a coding manual. However, since most of the questions are open-ended in this survey, graduate students need to rely on their own judgment to score the responses. The process is time-consuming, and it may raise concerns about validity and reliability. Second, in the RTS and Teacher Emotional Intelligence Measure, additional studies are also needed to replicate the findings related to reliability and predictive validity (Friedman, 2014; Stacey et al., 2004). Third, both instruments focus on a few selected psychometric properties, such as classroom disciplinary interactions between teachers and students, which may not represent teachers' EI in a more comprehensive setting. Lastly, using vignette responses could limit the assessment of knowledge of emotions and the ability to identify effective emotion regulation strategies. Meanwhile, teachers' literary skills, such as reading comprehension and

verbal abilities, may constitute a source of variance in the coding of teachers' written responses to the vignettes. Fourth, assessing teachers' EI through teachers' reactions might lead to bias due to culture differences, because individuals are socialized to feel and express emotions in a manner that is acceptable and/ or endorsed by society (Averill, 1990).

In general, for current instruments, especially Stream 1 EI measures, Stream 3 EI measures, and teacher-related EI measures, there are issues regarding scoring systems, underrepresentation of the EI construct in the test items, unclear logical connections between test items and the construct, lack of internal associations predicted by theory, and lack of reliability. Though Stream 2 EI measures show good reliability and validity, they are not developed based on K-12 teachers' complex professional settings. Overall, there is a dearth of valid and reliable scales tailored for K-12 teachers. Given the importance of teachers' EI, improving teacher's well-being and effectiveness as well as advancing the study of SEL in education require valid and reliable measures to assess teachers' EI in educational settings.

Measure Development

This study follows Miller et al.'s (2011) steps to develop psychological instruments. The first step involves defining the content that the researcher intends to measure, the target audience, and the test purpose. In the current study, the target audience is in-service teachers, and the purpose of the measure is to gain an understanding of how teachers perceive their EI in two dimensions in their professional settings: the self and the interactions with students.

The second step involves creating an operational definition of the construct, the format for the questions, and how the test will be scored (Miller et al., 2011). The theoretical framework for this EI instrument is built on Mayer and Salovey's (1997) Four Branches Model of EI for the following two reasons. First is that the Four Branches Model of EI has been tested the most in

the field of education. Since the current study's target population is K-12 teachers, Mayer and Salovey's theory, which was developed based on adult research and is associated with a wide range of critical outcomes among adults, may be more appropriate. Second, with the debates of EI, the Four Branches Model of EI covers the core elements of EI competencies, which are *Perceiving Emotion*, *Facilitating Thoughts Using Emotion*, *Understanding Emotions,* and *Managing Emotions*. Though EI differs among individuals, some people are more naturally endowed while others are less so. Yet, it can be developed over a person's life span and can be enhanced through training (Ashkanasy & Daus, 2005; Dolev & Leshem, 2017; Pozo-Rico et al., 2020; Vesely et al., 2013), which indicates that EI should be considered as a set of abilities.

Historically, ability EI has been assessed by performance-based tests. However, performance-based tests like MSCEIT (Mayer et al., 2002) have struggled with a lack of reliability while self-report assessments have demonstrated more consistent findings. In addition, as Hoffman (2009) pointed out, "norms regarding emotional expression, emotional experience, and emotional regulation are highly conditioned by culture" (p. 540). The possibility of method bias in EI measurement should be considered, which is present if the assessment procedures introduce unwanted inter-group differences (Van de Vijver & Leung, 1997). For example, the MSCEIT applies the criterion for correctness on ability EI test items. In some MSCEIT items, participants were asked to identify emotions from people's facial expressions. However, emotional expression and emotion recognition may vary across cultures (Ekermans, 2009). There could be differences in answers between Asians and Americans due to cultural differences rather than different levels of EI abilities (Wong et al., 2007). Therefore, in the current study, a self-report format is chosen.

There is more evidence to support the self-report format to assess teachers' EI. Existing research supports the link between perceived competence and teachers' motivation and engagement in professional learning broadly (e.g., Jansen in de Wal et al., 2014). It means that teachers' self-concept of their EI could predict their EI skills level. C. Saarni (1999) also insightfully posited that self-efficacy for emotional functioning may be a cornerstone of emotional competence. Indeed, studies indicate that teachers' perceptions of EI play important roles in teachers' self-efficacy, effectiveness, student achievement, and teacher-student relationships (Poulou, 2017b). Thus, the new measure is designed as a self-report scale focused on assessing not the real EI abilities as tests but teachers' EI through teachers' self-perceptions about their EI skills. It offers a relatively simple and efficient way of assessing teachers' EI.

Keeping EI constrained to a set of emotion-related skills makes it possible to assess the degree to which EI skills specifically contribute to behavior, as well as provide a firm foundation for developing programs to enhance these skills (Brackett & Geher, 2006; Brackett et al., 2010). In addition, studies have shown that "perceiving emotions" and "expressing emotions" are conceptually and factorially distinct (Elfenbein & MacCann, 2017; Parker et al., 1993). Therefore, I decided to divide the four factors in Mayer and Salovey's (1997) model into five factors: perceive emotions, understand emotions, regulate emotions, express emotions, and use emotions. Considering teachers' professional circumstances, teachers' EI was assessed through two perspectives: teachers' perception of their emotions at work (intrapersonal) and their perception of students' emotions (interpersonal). These two dimensions are often conflated by existing measures of teachers' EI (Table 5). The differentiated assessments of specific EI competencies enable researchers to move beyond "global" EI toward more multidimensional, and person-centered predictive models (Parker et al., 2011). Thus, TEIS aims at assessing

teachers' EI through their own perspectives in professional work contexts. I applied a 5-point response scale, with anchors ranging from *Never, Seldom, Sometimes*, and *Most of the time*, to *Always*. The higher the score, the higher the level of teachers' self-perceived EI.

At this point, a pool of items was created, developed on the teaching professional settings. Some items were inspired by measures like the WLEIS (Wong & Law, 2002) and the AES (Schutte et al., 1998). In total, 43 items were created and submitted to experts in the field to verify the content validity. In addition, to improve participant comprehension and reduce measurement error (Podsakoff et al., 2003), items were described in straightforward and non-pejorative language to increase the likelihood of truthful responses (Simms, 2008). A target population group ($N = 7$) reviewed all items. Several items were revised after receiving the feedback and a 36-item scale resulted. This new measure is called the TEIS.

Table 5

K-12 Teachers' Emotional Intelligence Model

Branches	Teacher-self dimension	Teacher-student interaction dimension
Perceive emotions	Identify self-emotions	Identify students' emotions through their vocal cues, facial expressions, language, behaviors, and other ways
Understand emotions	Understand self-emotions and recognize relations among them	Understand students' emotions and recognize relations among them
	Understand the antecedents, meanings, and consequences of emotions	Understand the antecedents, meanings, and consequences of students' emotions
Express emotions	Express emotions accurately	Help students to express emotions accurately
	Express emotions appropriately	Helps students to express emotions appropriately
Use emotions	Use emotions to understand needs	Use students' emotions to deal with students' needs.
	Use emotions to direct behaviors.	Use emotions as means to regulate students
Regulate emotions	Regulate self-emotions effectively	Use strategies to maintain, reduce, or intensify students' emotions
	Stay open to pleasant and unpleasant feelings	Help students to regulate their emotions
	Engage with emotions if they are helpful	Cultivate positive emotion transfer to subject matters

Testing the Measure

The TEIS was examined in two separate studies. In the first pilot study, I tested the internal consistency using Cronbach's α to assess the new measure's reliability in a cohort of in-service K-12 teachers ($N = 68$) from Virginia, US. Participants were in-service teachers enrolled in graduate programs at a School of Education in the State of Virginia. The reliability analysis performed indicated good internal consistency of the two dimensions and of the total score: the Alpha level of the teacher-self dimension was .861 and the Alpha level of the teacher-student interaction dimension was .874. Further, the Cronbach's α value across all items was .91, indicating a high degree of internal consistency.

Nomological validity was established by testing the correlations between the TEIS and respectively the Teacher Sense of Efficacy Scale Short Form (Tschannen-Moran & Woolfolk Hoy, 2001), the Teachers' Aggressive Disciplines Strategies (Riley et al., 2012), and self-developed Teachers' Attitude to Technology scale. The correlation coefficients between the TEIS and the three measures were in the expected direction. EI (as represented by the mean score across the five EI factors and two dimensions) had a significant positive correlation with teacher self-efficacy (r =. 45, $p < .05$, $N = 57$), a significant negative correlation with teacher aggression (r = -.37, $p < .01$, $N = 60$) and an insignificant correlation with teachers' attitude toward technology (r = .08, ns, $N = 60$). Thus, the new measure demonstrated good reliability and validity due to strong internal consistency and conceptual confirmation of the nomological network.

However, due to the limited sample size in the pilot study, I was unable to conduct a factor analysis to refine and validate the structure of the TEIS. Therefore, a second study was conducted within another group of in-service teachers in Virginia to refine the measure and ascertain its dimensionality by Exploratory Factor Analysis (EFA). Similar to the first pilot study, Cronbach's α were calculated as an indicator of internal consistency and convergent evidence of validity (both positively and negatively) were established.

Methods

Participants. In total, 328 K-12 in-service teachers from four different school districts in the State of Virginia, USA, were invited by emails and completed the survey. Two different groups of participants have been identified to accommodate the data analyses. For EFA, 223 participants who completed the new EI measures were included. The sample has roughly equal distribution of teachers' teaching experiences (see Table 6): 21.5% ($N = 48$) of participants have

3–6 years of teaching experience; 18.8% ($N = 42$) of participants have 7–10 years of teaching experience; 17% ($N = 38$) of participants have more than 20 years of teaching experience; 16.6% ($N = 37$) of participants have 11–15 years of teaching experience; 13% ($N = 29$) of participants have less than 3 years of teaching experience; and 13% ($N = 29$) of participants have 16–20 years of teaching experience. Most of the participants selected female to describe themselves (79.8%, $N = 178$). A majority, 68.2% ($N = 152$), of the participants have a master's degree and 25.1% ($N = 56$) of the participants have a bachelor's degree. Only around 3% ($N = 7/8$) of the participants have doctorate degree or a specialist certificate.

Table 6

Demographic Information of Exploratory Factor Analysis

Demographic categories	*f*	%
Teaching experiences		
< 3 years	29	13%
3-6 years	48	21.5%
7-10 years	42	18.8%
11-15 years	37	16.6%
16-20 years	29	13%
> 20 years	38	17%
Gender		
Female	178	79.8%
Male	45	20.2%
Highest level of education		
Bachelor	56	25.1%
Master	152	68.2%
Specialist	8	3.6%
Doctorate	7	3.1%

For convergent validity testing, records having more than five missing responses were deleted. Regarding the records having less than or equal to five missing ones, the means were computed to replace the missing data points. Thus, 177 valid responses were collected. In this sample, 19.8% ($N = 35$) of the teachers have more than 20 years of teaching experience,

followed by 18.6% (*N* = 33) with 11–15 years of teaching experience, 18.1% (*N* = 32) with 3–6 years of teaching experience, 15.3% (*N* = 27) with 7–10 years of teaching experience, 14.7% (*N* = 26) with 16–20 years of teaching experience, and 13.6% (*N* = 24) with less than 3 years of teaching experience. 81.9% (*N* = 145) of the participants are reported as female. 56.5% (*N* = 100) of the participants have a master's degree and 37.9% (*N* = 67) of the participants have a bachelor's degree. Only 2.8% (*N* = 5) of them have a doctorate degree or a specialist certificate (see Table 7).

Table 7

Demographic Information of Convergent Validity Testing

Demographic categories	*f*	%
Teaching experiences		
< 3 years	24	13.6%
3-6 years	32	18.1%
7-10 years	27	15.3%
11-15 years	33	18.6%
16-20 years	26	14.7%
> 20 years	35	19.8%
Gender		
Female	145	81.9%
Male	32	18.1%
Highest level of education		
Bachelor	67	37.9%
Master	100	56.5%
Specialist	5	2.8%
Doctorate	5	2.8%

Instruments. Participants completed the TEIS online or in person, along with the measure of teacher well-being and burnout to provide evidence of validity (Appendix A).

Teacher Well-Being. Collie and colleagues (2015) developed a Teacher Well-Being Scale, which consists of 16 items relating to teachers' experiences at work. The scale measures three factors of teacher well-being: workload well-being (e.g., "Work I complete outside of

school hours for teaching"), organizational well-being (e.g., "Support offered by school leadership"), and student interaction well-being (e.g., "Relations with students in my class"). The items are scored on a 7-point response scale ranging from *Negatively* (1) to *Positively* (7). An internal consistency analysis of the scale showed a Cronbach's α of .89 (Collie et al., 2015). In the current study the Cronbach's α was reported as .87.

Teacher Burnout. Teacher burnout was assessed by the Teacher Burnout Scale developed by Seidman and Zager (1986). It presented teachers with questions about their perspective on teaching with a 5-point scale ranging from *Strongly Disagree* (1) to *Strongly Agree* (5). There are four subscales of the instrument: (1) Career Satisfaction; (2) Perceived Administrative support; (3) Coping with Job-Related Stress; and (4) Attitude towards Students. Two subscales (Perceived Administration support, α = .84; Coping with Job-Related Stress, α = .80) with 12 items in total were used in the current study. Example questions include, "I believe that my efforts in the classroom are unappreciated by the administrators" and "I find it difficult to calm down after a day of teaching." Burnout scores were calculated separately for each subsection, with a higher score suggesting higher burnout feelings (Seidman & Zager, 1986). In the current study the Cronbach's α was reported as .89 in total, .85 for Perceived Administration support, and .87 for Coping with Job-Related Stress.

Results

Exploratory Factor Analysis

Due to the limitation of sample size, this study only conducted EFA to examine patterns of interrelatedness among items in a measure without being constrained by a priori hypotheses (Kline, 2011). In other words, it allows the researcher to discover whether there are any coherent subsets of items and the nature of these subsets (Tabachnick et al., 2007). In the current study, R package *lavaan* (Rosseel, 2012) was applied to conduct data analysis.

For EFA, principal component analysis with varimax rotation was used. Because EFA is an exploratory procedure (Brown, 2006), steps must be taken to determine the most appropriate number of factors to be retained. I made decisions about the number of factors to retain on a combination of methods including eigenvalue >1.0, scree plots, as well as conceptual clarity, theoretical salience of the factors, and simple structure. My goal was to have the smallest number of possible factors and for each item to load on only one latent factor. Items should preferably load greater than 0.40 on the relevant factor and less than 0.40 on all other factors (Stevens, 1996). Since the new EI measure has two distinct dimensions, teacher-self dimension and teacher-student interaction dimension, two separate EFA have been conducted for each dimension.

Prior to conducting EFA, I examined two indicators to determine whether the sample was appropriate for such an analysis. For teacher-self dimension, the Kaiser-Meyer-Olkin measure of sampling adequacy index was .87, and Bartlett's test of sphericity was significant, $\chi^2(153) = 1726.63$, $p < .0001$, indicating that the sample and correlation matrix were appropriate for the analysis. For the teacher-student interaction dimension, the Kaiser-Meyer-Olkin measure of

sampling adequacy index was .91, and Bartlett's test of sphericity was significant, $\chi^2(153) = 1916.14$, $p < .0001$, which also indicates the appropriateness of EFA.

For the teacher-self dimension, through running several EFAs, four items were removed based on the strength of the factor loading (e.g., low loading or cross-loading with other factors) and/or interpretability (e.g., items did not make conceptual sense in relation to the factor on which they loaded; Brown, 2006). This procedure resulted in a 14-item instrument accounting for 58% of the variance in teachers' EI scores of the self-dimension. Fit indices for the final EFA involving 14 items showed the following Root Mean Square Error of Approximation (RMSEA) = .025, Tucker-Lewis index (TLI) = .99, and Root Mean Square Residual (RMSR) = .02. These indices suggest that the four-factor solution has adequacy to good fit. Table 8 shows the factors, the corresponding items, and the factor loadings. Except for the combination of understand and perceive emotions, the rest of the factors align with the theoretic structure indicated in the previous section.

Table 8

Teacher-Self Dimension's Factor Loadings From the Exploratory Factor Analysis

Item	Loading
Factor 1: Perceive & Understand emotions	
1. I am aware of my emotions as I experience them.	0.558
2. I have a good sense of why I feel certain feelings.	0.681
3. I know why my emotions change.	0.741
4. I have a good understanding of my own emotions.	0.633
Factor 2: Express emotions	
5. I am able to clearly describe my feelings.	0.689
6. I can articulate how I am feeling.	0.834
7. I can put my emotions into words.	0.897
8. I am able to express my emotions effectively.	0.669
Factor 3: Regulate emotions	
9. When I am angry, I can calm myself down.	0.630
10. I have good control of my emotions.	0.744
11. I am able to express myself in a calm way, even if I am upset.	0.570
Factor 4: Use emotions	
12. My emotions help me to focus on what is important to me.	0.792
13. I use my feelings to understand my needs.	0.805
14. My emotions guide me in difficult situations.	0.592

For the teacher-student interaction dimension, I dropped six of the 18 items following the rules mentioned previously. This procedure resulted in a 12-item instrument accounting for 60% of the variance in teachers' EI scores of the teacher-student interaction dimension. Fit indices for the final EFA involving 12 items showed the following RMSEA = .005, TLI = .99, and RMSR = .01. These indices suggest that the 5-factor solution has adequacy to good fit and aligns with the theoretical model. Table 9 shows the factors, the corresponding items, and the factor loadings.

Table 9

Teacher-Student Interaction Dimension's Factor Loadings From the Exploratory Factor Analysis

Item	Loading
Factor 1: Perceive emotions	
1. I am aware of non-verbal messages students send.	0.550
2. I can guess what students are feeling by observing their facial expression.	0.831
3. I can guess how students are feeling by listening to the tone of their voice.	0.765
Factor 2: Understand emotions	
4. I can identify my students' feelings.	0.509
5. I am good at understanding how students are feeling.	0.739
Factor 3: Regulate emotions	
6. I am good at motivating students.	0.551
7. I help students feel better when they are discouraged.	0.479
Factor 4: Express emotions	
8. When a student comes to class feeling angry, I can help him/her to calm down.	0.643
9. When students are upset, I can help them express their feelings effectively.	0.894
10. I can assist students to articulate their emotions.	0.619
Factor 5: Use emotions	
11. I respond to students' changing emotions by making adjustments in my classroom.	0.522
12. I understand the needs behind students' emotions.	0.468

Internal Validity

The reliability was assessed by Cronbach's α, which is used to measure the internal consistency of the new measure (Cortina, 1993). A higher coefficient alpha reflects a higher expectation of reliability of the measure and a higher consistency in the results across items in the test. In the current study, the internal consistency estimates were respectively 0.84 for the four-factor teacher-self dimension, and 0.88 for the 5-factor teacher-student interaction dimension (Table 10).

Table 10

Means for Teacher Emotional Intelligence Scale Dimensions and Total Score

Dimensions	*M*	*SD*	α
TEIS	3.840	0.327	0.88
Teacher-self dimension	3.849	0.390	0.84
Teacher-student interaction dimension	3.829	0.403	0.88

Convergent and Discriminant Validity

To further test the validity of the TEIS, I examined construct validity by assessing the correlation of this new measure with other existing measures (Kerlinger, 1986). Several different hypotheses are elaborated. First, researchers have found that teachers' trait EI is positively correlated with teacher affective well-being (Fernández-Berrocal et al., 2017). In addition, important indicators of teacher well-being like job satisfaction (Akomolafe & Ogunmakin, 2014; Olatomide & Akomolafe, 2013) are found to be positively correlated with teachers' EI. Thus, the first hypothesis is that teachers' EI will have a positive relationship with teacher well-being. Meanwhile, teaching can be a stressful job. Studies have found that the higher a teachers' EI, the lower their burnout tended to be reported (Chan, 2006; He, 2011; Ju et al., 2015; C. Wang, 2013; Yao & Guan, 2013; X. Zhang, 2012). Hence, the second hypothesis is that teacher burnout is negatively correlated with teachers' EI.

As predicted, teachers' EI scores were positively correlated with teacher well-being scores ($r = .28$, $p < .001$), and teachers' EI scores were negatively correlated with teacher burnout scores ($r = –.15$, $p < .05$). The magnitude of the correlations was small to moderate (J. Cohen, 1988). For the two dimensions, the self-dimension of teachers' EI showed a significant positive relationship with teacher well-being ($r = .31$, $p < .001$) and negative relationship with teacher burnout ($r = -.24$, $p < .001$). Both relationships could be considered as moderate (J.

Cohen, 1988). However, the findings indicated that teacher-student interaction dimension of teachers' EI was not significantly associated with teacher well-being (r = .13) and teacher burnout (r = -.13) in general. This could be caused by the non-student related indicators in two measures of teacher well-being and teacher burnout. For instance, teacher burnout was measured through two subscales: Perceived Administrative Support and Coping with Job-Related Stress. None of them are directly related to the interaction between teacher and students. Thus, no association has been found between the teacher-student interaction EI dimension and these two subscales. However, when we investigated the relationship between the teacher-student interaction dimension of EI and student interaction subscale of teacher wellbeing, which are theoretically related to each other, a moderate positive and significant relationship (r = .28, p < .001) were found.

Discussion

This study aimed to extend the understanding of teachers' emotional capabilities by developing a dedicated measure to assessing teachers' EI in their professional contexts. To further extend the knowledge, more examinations for TEIS are needed. This type of research also has the potential to inform our understanding of other ramifications like teacher well-being and burnout.

To develop the new measure, a pool of items was administered to experts in the field and a targeted in-service teacher population. Following this, exploratory factor analyses were conducted to identify two structures of the TEIS: a 4-factor teacher-self dimension and a 5-factor teacher-student interaction dimension. Taken together, both dimensions and factors highlight that teachers' EI is a multi-dimensional construct. It provides a more comprehensive perspective to understand teachers' EI in their daily work. In addition, The TEIS and dimensions were found to

have scores that were internally consistent, and the magnitude of their Cronbach alpha estimates appear adequate for general research purposes (Henson, 2001; Nunnally & Bernstein, 1994).

The TEIS offers a comparative simple and efficient way to assess teachers' EI through teachers' self-perceptions. It not only extends our conceptualization of teachers' EI in their professional work, but also provide a tool to create or test the efficacy of EI trainings. While current TEIS only focus on teachers' perception of EI in two dimensions: their own EI as well as teacher-student interaction, teachers' professional work is more complicated that these two dimensions in the real world. Thus, in the future, more studies focus on other dimension of teachers' EI would be helpful to complete the puzzle, such as teacher-principal interactions or teacher-parent interactions. In addition, since culture might be influential in assessing teachers' EI , though self-report format might be able to reduce the risk, more studies to test the TEIS in different cultures are highly recommended. Additionally, the TEIS focus on assessing teachers' EI in their professional settings, it will be helpful to understand EI in relation to personal vs. professional lives to gain a more comprehensive picture about EI.

Moreover, correlations provided preliminary evidence of validity based on relations to five other variables: teacher self-efficacy, teacher aggression, teachers' attitude to technology, teacher well-being, and teacher burnout. Five hypotheses about convergent and discriminant evidence of validity were supported. Namely, the moderately positive correlation between teachers' reported EI and teacher self-efficacy, teacher well-being, along with the small negative correlation between teachers' reported EI and teacher burnout, teacher aggression, as well as the non-relationship between teachers' reported EI and teachers' attitude to technology were supported and provided evidence of validity. Taken together, these correlations conceptually situate the teachers' EI and provide support for the interpretations of scores on the TEIS. Future

research should examine scores on the new EI scale in relation to additional variables to provide further evidence of validity and greater understanding about the potential of teachers' EI.

Limitations

There are several limitations to this study that must be highlighted. First, due to the nature of the online data collection, it was not possible to ascertain exact response rates raising questions about the representativeness of the data. Online data collection does have several strengths, however, including its broad reach and lower cost. In the current study, a paper-based survey was also administered in one school district in the State of Virginia. Second, self-report questionnaires rely on participants' accurate interpretations of the items. Though the items were designed with straight-forward and non-pejorative language to increase the likelihood of truthful responses (Simms, 2008), it is important to report the result with representative language (e.g., teachers perceived, reported, experienced) to clarify that the data refer to self-reports. Third, social desirability is another threat to the validity of self-reports. Relying on only one source of data potentially puts findings threatened by single source bias. In this case, social desirability might decrease the validity of the data. Fourth, though nomological network may work as a philosophical foundation for construct validity, it does not provide a practical and usable methodology for assessing construct validity. Future studies could apply a multitrait-multimethod matrix to move a bit further toward a methodological approach to construct validity. Fifth, due to the limitation of sample size in the current study, a confirmative factor analysis is not conducted. To further support the robustness of the measure, future research is needed to confirm the new measure's factor structure as well as test it with different samples.

Conclusion

In summary, this study has involved developing and testing a measure of teachers' EI based on teachers' professional working experiences. As such, the Teachers' EI scale is a measure that holds promise for helping teachers, school administrators, and policy makers to understand, assess, and, potentially, guide efforts to improve teachers' EI. In addition, it is hoped that the findings of this study will help to spur greater attention to the construct of teachers' EI in the literature.

CHAPTER 4: Exploring Teachers' EI In China: A Mixed Methods Study

The discussion about teachers' EI has increased in China. Previous research showed that teachers' EI was negatively associated with teacher burnout, which is an important indicator of teacher well-being (Chan, 2006; M. Chen, 2019; Ju et al., 2015). Similar to the finding in the west, teachers who are skillful at mastering stress, burnout, and social-emotional challenges feel more efficacious, and teaching becomes more enjoyable and rewarding to them (Goddard et al., 2004).

Additionally, teachers with higher EI tend to report higher levels of self-efficacy (Chan, 2004; Wu et al., 2019); higher level of teaching/job satisfaction (Gao et al., 2013; Xie, 2014; Yin et al., 2013; Zhao, 2020); and more workplace social support (Ju et al., 2015). What's more, teachers' EI has been found positively related to professional commitment (Duan, 2010); job performance (L. N. Chen, 2014; X. Zhang, 2012); and work engagement (Xiao, 2016). In other words, teachers with higher levels of EI tend to enjoy their work more, which could lead to more effective teaching.

Given the crucial position of teachers in students' schooling, teachers' EI has a positive relationship with students' EI (Ma et al., 2016). As outstanding role models, teachers interact with students throughout the school day and offer positive examples of how to deal with emotions effectively. Additionally, emotionally intelligent teachers could set a productive learning climate in their classrooms, which could further improve students' academic performance (G. Li, 2012). In contrast, less emotionally intelligent teachers are inclined to passive teaching with students in the classroom (M. Chen, 2019). Further, a teacher who

recognizes an individual student's emotions, understands the cognitive appraisals that may be associated with these emotions, and how these cognitions and emotions motivate the student's behavior can effectively respond to the student's individual needs, further leading to better teacher-student relationships (Sun et al., 2015).

Studies have shown that Chinese teachers had trouble dealing with their own emotions effectively (Liao, 2013; Qiu, 2011), lacked skill in emotional expression (Jia & Zhu, 2014) as well as the skills of managing others' emotions (Xia, 2015). This situation is exacerbated due to a lack of studies on teachers' EI as well as a lack of training for teachers to develop EI relevant skills (G. Li, 2012). Thus, before support can be formulated to help Chinese teachers develop EI skills, there is a need to have a clear understanding of K-12 teachers' EI in China. In the current study, I performed a mix-methods study to expand the understanding of K-12 teachers' EI in China. This study was conducted in two phases: one completed in 2020 to assess teachers' understanding of EI and their professional experiences related to EI, and the other completed in 2022 to validate a new EI measure in China.

Literature Review

EI Definitions and Instruments in China

Over the past two decades, Chinese psychologists have introduced different EI theories from the west and adapted several of them to China's context (Lu, 2005; X. J. Wang, 2000). Most of these measures were developed and revised based upon Mayer and Salovey's (1997) Four Branches Model of EI. The most commonly used scale to assess teachers' EI is the Chinese version of the Wong and Law (2002) Emotional Intelligence Scale (e.g., Chen, 2014; Ge, 2011; Hou et al., 2014; Jia & Zhu, 2014; L. Li et al., 2011; Miu, 2009; C. Wang, 2013; Xiao, 2016; Yin et al., 2013). The internal consistency reliability of the Wong and Law Emotional Intelligence

scale was consistently over 0.80 across 10 independent Chinese samples. Evidence concerning its construct validity has been tested with Multitrait-Multimethod analyses, which is an approach to assess the construct validity of a set of measures in a study in two independent Chinese samples (Law et al., 2004; Wong & Law, 2002). It measures four dimensions: 1) self-emotional appraisal—the individual's ability to understand their emotions; 2) others' emotional appraisal—the ability to recognize and understand other people's emotions; 3) use of emotion—the tendency to motivate oneself to enhance performance; and 4) regulation of emotion—the ability to regulate emotions. The Assessing Emotions Scale (AES; Schutte et al., 1998), which was translated into Chinese by C. Wang and He (2002) is the second most common choice among Chinese researchers in the study of teachers' EI (e.g., G. Li, 2012; Ma et al., 2016; Sun, 2012; Sun et al., 2015; Xia, 2015; Xie, 2014). The AES is a method of measuring general EI using four sub-scales: emotion perception, utilizing emotions, managing self-relevant emotions, and managing others' emotions (Schutte et al., 1998). It is also widely applied in Chinese population and developed based on Mayer and Salovey's Four Branches Model of EI. However, those EI frameworks and corresponding scales are not designed or tailored for K-12 teachers. There is also a lack of information reporting on these scales' reliability and validity with Chinese K-12 teachers.

Teachers' EI in China

Despite the origin of the two above-noted scales from the west, there are several scales revised or developed by Chinese researchers to explore teachers' EI. Two scales were found that were developed based on Salovey and Mayer's (1990) Four Branches Model of EI (Yang, 2009; Yao & Guan, 2013). Yao and Guan (2013) revised Salovey and Mayer's (1990) EI Scale. The revised scale is structured around four dimensions. It contains 10 items in the emotion

consciousness dimension, eight items in the thinking promotion dimension, seven items in the emotion understanding dimension, and seven items in the emotion regulation dimension. No information was provided in the study on the scale's reliability and validity. Yang's (2009) EI scale includes 20 items and four dimensions: emotion perception, emotion understanding, emotion expression, and emotion management, it is a self-report scale using points from 1 (*strongly agree*) to 6 (*strongly disagree*) for responses. This scale was tested in Gansu among elementary and middle school teachers and reported an internal reliability rating from 0.528 to 0.892. However, the measured variables did not well represent the number of constructs. Additional measurement studies are also needed for these two scales, to replicate their validity and reliability.

Thus, a new reliable and valid measure for K-12 teachers in China is needed. Huang's Teachers' EI scale (TEIS) presents a promising candidate for Chinese teachers. First, the new measure developed by Huang is built on Mayer and Salovey's (1997) Four Branches Model of EI. This model might be considered as the most appropriate EI theory framework for Chinese teachers, because it has been tested among Chinese teacher population for its alignment. The Four Branches Model of EI is more representative than other models since it covers most models' core elements of EI competencies. Second, culture could be a potential variable that affects the reliability and validity of EI instruments. Several studies claim that there are differences among different ethnic groups in three vital components of EI: Emotion Regulation, Emotion Expression, and Emotion Recognition (Elfenbein & Ambady, 2002; Matsumoto, 1989; Matsumoto et al., 2005; Pittam et al., 1995), so the traditional performance-based tests with right and wrong answers like the MSCEIT might not be appropriate. It might introduce unwanted inter-group differences (Van de Vijver & Leung, 1997). In this situation, Huang's self-report

measure TEIS might be a better way to reflect teachers' EI consistently. In addition, teacher self-efficacy's essential role in classroom practices (H. Li & Liu, 2000) and student outcomes (Shi & Lian, 2001) has been identified in China. It is safe to assume that the link between perceived competence and teachers' motivation and engagement in professional learning could be applied to teachers in China, which means that teachers' self-concept of their EI could predict their EI skills level. Thus, Huang's measure TEIS was designed as a self-report scale, which is focused not on assessing the real EI abilities as tests but assessing teachers' EI through teachers' self-perceptions. Therefore, TEIS is a promising candidate to measure teachers' EI in China.

As mentioned before, culture might impact the reliability and validity through three sources: the construct being studied, the methodological procedure, and the item content (Byrne & Watkins, 2003; Van de Vijver & Poortinga, 1997; Van de Vijver & Tanzer, 1997). The self-report approach could limit the problem of method bias. The EI construct itself might not be identical across cultures, which leads to construct bias (Van de Vijver & Leung, 1997). To test whether this assumption is true or not, I conducted a phenomenological study to explore K-12 teachers' understanding of EI and their experiences related to EI in China. Meanwhile, careful translation and cultural adaption were conducted to avoid by poor translation or inappropriate items for a specific context (Van de Vijver & Leung, 1997).

Phase 1 Qualitative Study

Since culture could potentially lead to construct bias during the measure adaption, it is essential to understand EI in China's culture. In addition, though several empirical studies have explored the relationships between teachers' EI and teacher job satisfaction, burnout, and so on, there is an absence of qualitative studies to explore teachers' understanding of EI. Thus, the first phase of this study is a qualitative design using a phenomenological approach, in an attempt to

better understand teachers' professional lives related to EI and teachers' understanding of EI (Roberts, 2013). Van Manen's (1997) approach to hermeneutic phenomenology was used. These understandings may not only support the cultural adaption of TEIS, but also enrich our understanding of teachers' EI from the perspectives of teachers in China.

Participants

Participants were recruited through a screening survey (Appendix B) and the only inclusion criterion was if the teachers would like to talk about their professional experience related to EI. The study was conducted with the participation of 10 teachers in China. The 10 teachers were all female elementary teachers. They ranged in age from 24 to 37 and in teaching experience from 1.5 to 17 years. They held associate degrees, bachelor's degrees, and master's degrees (Table 11).

Table 11

Participants' Characteristics

No.	Gender	Grade	Education Level	Location	Age	Teaching Experience (years)	Workload[a]
P1	Female	elementary	bachelor's	Chongqing	29	3	16
P2	Female	elementary	master's	Shanghai	27	2	22
P3	Female	elementary	bachelor's	Yunnan	27	6	12
P4	Female	elementary	bachelor's	Chongqing	24	3	10
P5	Female	elementary	bachelor's	Guangzhou	25	1.5	18
P6	Female	elementary	bachelor's	Yunnan	24	4	5
P7	Female	elementary	associate	Yunnan	37	17	12
P8	Female	elementary	bachelor's	Chongqing	28	5	10
P9	Female	elementary	master's	Shanghai	27	2	12
P10	Female	elementary	bachelor's	Chongqing	26	5	10

[a] classes taught/week; 45 minutes/class

Data Collection

Data were generated in two phases: one-on-one online semi-structured interviews and participant journal entries during January and February in 2020. Interviews were conducted in an open-ended way, using a general interview protocol (Creswell & Poth, 2018). The interviewer

had the freedom to build a conversation and word questions spontaneously to elicit and illuminate questions (Patton, 2002). All the questions were translated into Chinese properly. All interviews lasted around 60 minutes. Sample questions include:

- What crosses your mind when you hear the word EI?
- Can you explain your good or bad experiences of feeling and controlling your emotions at work?
- What does EI mean to you in your professional life?

The second source of data was a journal that every participant submitted a week after the interview. The journal includes three different teaching scenarios related to teacher-student interactions that involved EI. For each scenario, the participants were asked about their actions, reasons behind their actions, their emotions, and students' emotions. It provides an opportunity for the participants to reflect on their real-life experiences in professional settings related to EI. The journal scenarios were developed based on the model of EI (Table 12).

Table 12

Journal Scenarios

Scenario	Theory
When you are teaching, two students are chatting with each other. You already reminded them to be quite and focusing on class 5 minutes ago, but they still keeping chatting with each other.	Perceive emotions Regulate emotions
A student runs to your office with tears. You have no idea why she is crying, and she doesn't want to tell you why immediately.	Perceive emotions Understand emotions Express emotions
Your class is scheduled after a physical education class. At the beginning of your class, all students are too excited to focus on class. They are still immersed in the However, after 20 minutes, students couldn't focus on class due to the exhaustion.	Perceive emotions Understand emotions Regulate emotions Use emotions

Data Analysis

I analyzed interviews and journals data holistically and thematically with priori codes. The holistic analysis focuses on descriptions, rather than the development of analytic categories. It describes connections among data within their original contexts (Rossman & Rallis, 2003). Thematic statements were isolated through both the holistic and the detailed reading approaches. Therefore, in the holistic reading approach, I considered the transcript of each interview and journals as a whole and describe the main concept in several sentences. In the detailed reading approach, I read the transcript several times first to find the statements or phrases, and selected EI definitions relate to my EI definitions were selected (Creswell & Poth, 2018). Then I examined the transcript sentence by sentence to discover the topic-related information. Isolating, rewording, and labeling thematic statements were done for each interview transcript to develop primary themes. After that, I developed primary categories by grouping the developed themes. Meanwhile, the primary themes are frequently revised; overlapping or common themes were combined; inappropriate themes were deleted; and essential themes were identified. In other words, expressions, sentences, and paragraphs of each interview were independently organized into themes and subthemes based on their commonalities (van Manen, 1997). To test whether Chinese K-12 teachers' understanding of EI and their professional lives align with Huang's conceptualization of EI, a priori codes were developed based on the EI framework. I also stayed open to additional codes emerging during the analysis (Creswell, 2013). With the themes identified, I then began the process of writing the themes and describing how they were connected to the codes and interrelated in interview transcripts and journals. In this stage, all analyses were conducted in Chinese to ensure the distance between meanings experienced by the participants and meanings interpreted in the findings was as close as possible (Van Nes et al.,

2010). At last, themes and subthemes were translated into English with the cooperation of a professional translator.

Trustworthiness

To ensure the rigor of the study, this study established provisions for trustworthiness. The triangulation of data sources, methods, and investigators establishes credibility (Guba & Lincoln, 1989). I used two different sources in this study to shed light on a theme. Furthermore, I followed the member-checking process in which the participants checked the accuracy of their accounts and confirmed whether the interpretations were fair and representative of their thoughts (Creswell & Poth, 2018).

In addition, since this study was conducted in Chinese, the translation could influence the trustworthiness of the study. I gathered data in Chinese and stayed in the original language as long and as much as possible (Van Nes et al., 2010). I also operated as a translation moderator in cooperation with a professional translator. This process involved explaining to the translator the intended meaning and its context in the source language. This process was done in a side-by-side procedure where possible wordings were discussed together by the researcher and the translator (Van Nes et al., 2010).

Results

Findings are reported by four themes: the definition of EI, teachers' EI components, teachers' EI roles, and difficulties related to EI. First, EI has been translated into two terms in Chinese based on different theoretical frameworks: Qingxuzhili (情绪智力) and Qingshang(情商). Qingxuzhili is more widely applied in academic publications as ability EI while Qingshang is popular in the mass media that was introduced by Goleman's books about mixed EI model (M. Zhang, 1996). For participants in the current study, they were more familiar with the term

Qingshang but all participants believed that EI is an ability that could be learned. Participants' understanding of EI emphasized emotional regulation of either self-emotions or others' emotions. In addition, some of them acknowledged that EI also included understanding self and others' emotions, using emotions, and expressing emotions.

Teachers' EI Components. According to participants' experiences, teachers' EI was crucial in teachers' professional lives. Themes had been found align with my conceptualization of EI: perceiving emotions, regulating emotions, using emotions, and understanding emotions, and expressing emotions (Table 13).

Table 13

Code Book and Theme Frequency

		f (*n* = 10)	
Theme	Definition	Interview	Journal
Perceive emotions	Identify self and students' emotions	8	7
Regulate emotions	Regulate self-emotions and students' emotions	10	10
Use emotions	Use emotions to understand needs and direct behaviors	9	9
Understand emotions	Understand self and student emotions and recognize relations among them	9	10
Express emotions	Express self-emotions accurately and appropriately Help students to express accurately and appropriately	10	8

Perceive Emotions. Some teachers noted perceiving their self-emotions and students' emotions as aspects of EI. Teachers would and could perceive students' emotions through students' faces, eyes, behaviors, and iterations.

> I think students' emotions are mostly related to the class. Asking questions could be a way to know students' emotions. (P. 9, interview)

In addition, students in lower grades tend to express their emotions more obviously than students in higher-grade since students learned how to hide their emotions. In this situation, communication became a major way to perceive students' emotions.

> I think the first-grade students' emotions are easier to be perceived, because their happiness and unhappiness are shown on their faces. However, it becomes more and more challenging to know students' emotions when students move to higher grade levels. They know how to hide their emotions. (P. 8, interview)

Regulate Emotions. The whole group of participants agreed that teachers needed to know how to control their emotions in their professional lives, especially when interacting with students and parents. Teachers reported often needing to regulate their emotions. To sustain professionalism, it was important to leave their negative emotions from their personal lives outside of the classrooms. Participants indicated that they would regulate their emotions like cheering themselves up before entering the classroom since they believed teaching was a process that needed to be filled with positive emotions. These positive emotions could lead to a high-spirit classroom climate and then inspire students' learning. Thus, in the classroom, several attempts to regulate teachers' emotions from negative to positive were taken. In addition, teachers would consciously reduce the influence of negative emotions on themselves and others.

> Sometimes if I am upset, I will prepare for the lesson early to get my emotions ready. I will think about how I should speak and behave to avoid showing my upset to others. (P. 7, interview)

Participants agreed that teachers need to be equipped with the ability to influence and regulate students' emotions. On one hand, teachers often used instructional strategies to brighten

their moods to prepare students better for learning in the classroom. For example, teachers would design games to enliven the classroom atmosphere.

> As teachers, you need to maintain a positive learning atmosphere. Thus, you need to know what to teach, how to teach, and students' interests. You need to know the class design that attracts your students to help them stay active in the classroom. (P. 2, journal)

On the other hand, outside the classroom, encouraging, caring, and showing love were also used to build trusting relationships, which further helped students regulate their emotions. Participants often communicated privately, with patience, with students who were upset, sad, and angry.

> Sometimes students are too upset to learn. In this situation, I often communicate with them privately with encouragement. (P. 3, journal)

Use Emotions. Use emotions has two dimensions: one is using teachers' emotions and the other one is using students' emotions. Almost all participants reported that they exaggerated and sustained their positive emotions to deal with adversity. They also used emotions to direct their decisions. Negative emotions were signs that ask for changes, either for teachers themselves or students. For example, participants believed that students' negative emotions in the class could be a message to show changes were needed in instruction.

In addition, participants mentioned that students' emotions were invaluable sources that helped them to uncover students' hidden issues. Students' emotions reflect students' potential needs. Teachers would also use their emotions to give feedback on students' behaviors or to build relationships with students. Participants believed that students could understand whether their behaviors were appropriate according to teachers' emotions.

Understand Emotions. It is shown in interviews and journal entries that almost all participants understand the importance of emotions. They reported a range of emotions during their work, either positive (e.g., happy) or negative (e.g., angry, depressed, haste). Students, parents, and heavy workloads were triggers to influence teachers' emotions. Among these triggers, students were the most influential factors in terms of evoking teachers' emotions. According to participants, students' misbehaviors and lack of classroom discipline were most frequently related to teachers' negative emotions, which requires teachers to control their negative emotions in and out of the classroom. Meanwhile, students' achievement was strongly connected to teachers' positive emotions.

Participants also reported a high level of stress, which was the main reason for negative emotions. Participants had a good understanding of what their as well as students' emotions were and understood where these emotions came from. Some of them mentioned that they could predict students' emotions and showed their predictions in their journals.

> Every child has different emotions for different reasons. It takes time and effort to understand. (P. 1, journal)

Participants knew their negative emotions would negatively influence their life and work. Their work performance, work attitude, and mental state. Conversely, positive emotions could improve their work performance and attitude positively.

> I feel I can't get things done when I am in a bad mood. It also influences my attitude toward others. I know I need to prepare my emotions ready before I work. (P. 7, interview)

Participants agreed the more teaching experience, the better their emotion control competencies. This could be because teachers with more experience had to deal with similar situations as well as being more knowledgeable in EI.

Express Emotions. There was an interesting finding among the Chinese teachers in this study. Besides the way to regulate negative emotions and maintain positive emotions, participants would pretend to be angry or control their expression of happiness in the classroom. They believed that if teachers were too nice, it would become difficult to manage the classroom. They preferred to sustain a power distance between themselves and students. While maintaining the learning climate during the class, most of the time, teachers would avoid direct negative emotional expression. Participants believed expressing their negative emotions in school was unprofessional and inappropriate. Teachers should establish and maintain a positive learning environment filled with positive emotions, where student beliefs, confidence, skills, and values could be fostered and developed. In addition, each teacher had different ways to express their emotions through eyes, face, and behaviors.

Role of Teachers' EI. According to the interviews and journal entries, the vital role of teachers' EI was confirmed due to its impact on classroom management, teaching, teacher-student relationship, and students' EI and achievement. As the two groups of people in schools are most likely to interact, students' and teachers' emotions affected each other. With emotionally intelligent teachers, the teaching quality, classroom management, and student EI could be improved.

> I found that when I was impatient, students perform worse in exams and classroom practices. Conversely, when I regulate my emotions to remain calm and in control. I can better communicate with students with encouragement and guidance rather than just

blaming them. Students perform much better in exams and achieve their learning goals. (P. 8, interview)

In addition, teachers' EI was related to student EI. It was a consensus among participants that teachers are students' models. Students would imitate their teachers in class and day-to-day activities. Furthermore, all participants believed that it was teachers' responsibility to teach students to understand emotions, express emotions, and regulate emotions.

> I think teachers' EI is very important, because teachers are the guides in the classroom. Either in the classroom or outside of the classroom, teachers' emotions will definitely influence students. Students will learn from teachers' emotions to know the rules in society. (P. 6, interview)

Teachers' EI will influence teacher-student relationships as well as student achievement since students tend to learn better if they like their teachers. Teachers' emotions would influence not only their attitude toward students but also their communication ways to students. Meanwhile, the mutual trusting relationship between teachers and students enables students to disclose their emotions to teachers.

Difficulties Related to EI. Participants reported that it was hard to regulate their negative emotions and to turn negative emotions into positive emotions directly. In addition, it was more challenging for teachers who had special needs students with emotion control issues in class. However, there was a lack of training and support related to EI according to the whole group of participants. Though some participants mentioned that their schools did talk about the importance of regulating teachers' emotions and understanding students' emotions, none of them had received any EI professional training.

Discussion

Findings indicate that elementary teachers' understandings of EI and teachers' experiences align with my EI definition and theoretical framework. Factors including perceive emotions, regulate emotions, use emotions, understand emotions, and express emotions were identified as components of teachers' EI in China. These findings respond to the concern of construct bias. However, it requires careful clarification of EI/Qingxuzhili to Chinese teachers to avoid potential misunderstandings. The importance of teachers' EI is also shown in Chinese teachers' professional lives, which echoes the previous empirical findings that teachers' EI has impacts on classroom management, teaching, teacher-student relationship, and students' EI and achievement (M. Chen, 2019; G. Li, 2012; Sun et al., 2015). However, participants shared their struggles with regulating their emotions and indicated the need for EI training. Findings point out the importance of understanding teachers' EI and accurate assessment of teachers' EI, which are foundations to improve teachers' EI.

Phase 2 Quantitative Study

Phase 1 qualitative study also emphasized the importance of teachers' EI in teaching and the needs to improve teachers' EI. According to the phase 1 qualitative study, though the culture is different in the U.S. and China, EI is a shared understanding in both countries. It indicated that Chinese teachers' understanding of EI and their professional experience aligned with Huang's teachers' EI Model for K-12 teachers, which shows the TEIS's potential to be applied in China. To accurately assess teachers' EI in China, however, closer examinations of the measure's internal consistency and validity are needed. Therefore, the current study is designed to explore and validate the TEIS among Chinese K-12 teachers through exploratory and confirmatory factor

analyses (EFA; CFA). I also examined preliminary estimates of reliability and convergent and discriminant validity for TEIS scores.

Participants

In total, the Phase 2 study received 495 responses from in-service teachers in China. For factor analysis, 395 (263 female, 132 male) participants who completed the TEIS were included (see Table 14). In this sample, roughly half of the teachers ($N = 209$) had more than 20 years of teaching experience, followed by 13.2% ($N = 52$) with three to six years of teaching experience, 9.9% ($N = 39$) with 16 to 20 years of teaching experience, 8.9% ($N = 35$) with less than 3 years of teaching experience, 8.6% ($N = 34$) with 7–10 years of teaching experience, and only 6.6% ($N = 26$) with 11–15 years of teaching experience. They also had a range of educational attainments: 7.6% received a high school certificate; 16.7% had a college equivalent certificate; 74.9% had a bachelor's degree; and 3.1% had a master's degree. To conduct factor analyses, this sample has been randomly split into two groups, one for EFA and the other for CFA.

Table 14

Demographic Information of Exploratory Factor Analysis and Confirmatory Factor Analyses

Demographic categories	*f*	%
Teaching experiences		
< 3 years	35	8.9%
3-6 years	52	13.2%
7-10 years	34	8.6%
11-15 years	26	6.6%
16-20 years	39	9.9%
> 20 years	209	52.9%
Gender		
Female	263	66.6%
Male	132	33.4%
Highest level of education		
College equivalent certificate	66	16.7%
High school certificate	30	7.6%
Bachelor	296	74.9%
Master	7	3.1%

For the convergent validity test, records with more than five missing responses were deleted. In regard to records that have less than or equal to five missing responses, the means were computed to replace the missing data points. After data cleaning, 384 valid responses were collected (Table 15). In this sample, 53.6% ($N = 206$) of the teachers have more than 20 years of teaching experience, followed by 13% ($N = 50$) with 3–6 years of teaching experience, 9.6% ($N = 37$) with 16–20 years, 8.6% ($N = 33$) with less than 3 years, 8.6% ($N = 33$) with 7–10 years, and 6.5% ($N = 25$) with 11–15 years. In addition, 67.7% ($N = 260$) of the participants were reported as female. Three fourths (74.5%, $N = 286$) of the participants had a bachelor's degree and 17.4% ($N = 67$) of the sample had a college equivalent certificate. Around 7.3% ($N = 28$) worked with a master's degree and only 0.7% ($N = 3$) had obtained a high school certificate.

Table 15

Demographic Information of Convergent Validity Testing

Demographic categories	*f*	%
Teaching experiences		
< 3 years	33	8.6%
3-6 years	50	13%
7-10 years	33	8.6%
11-15 years	25	6.5%
16-20 years	37	9.6%
> 20 years	206	53.6%
Gender		
Female	263	67.7%
Male	124	32.3%
Highest level of education		
College equivalent certificate	67	17.4%
High school certificate	3	0.7%
Bachelor	286	74.5%
Master	28	7.3%

Instruments

Teachers' EI. Teachers' EI was assessed by TEIS. It includes 36 items that are loaded in five factors: perceive emotions, use emotions, understand emotions, regulate emotions, and express emotions. The scale also has two dimensions to cover different aspects of teachers' EI: teacher-self dimension and teacher-student interaction dimension. This measure uses a 5-point response scale ranging, with anchors at *Never, Seldom, Sometimes, Most of the time,* and *Always*. The higher the score, the higher the level of teachers' self-perceived EI. In the current study, an internal consistency analysis showed a Cronbach's α of .95. Since Phase 1 study emphasizes the importance to be clarify about the EI definition to avoid potential misunderstandings, a short paragraph to explain teachers' EI has been added in the scale.

Teacher Self-Efficacy. Teacher self-efficacy was measured by Teacher Sense of Efficacy Scale Short Form (Tschannen-Moran & Woolfolk Hoy, 2001). It is comprised of 12

items loaded in three factors: efficacy in students' engagement, efficacy in instructional strategies, and efficacy in classroom management. Items are rated on a five-point Likert scale ranging from *Not at all* (1) to *A Great Deal* (5), with higher scores indicating a higher level of self-efficacy. In the current study, the reliability of the TSEC has been reported as .96.

Teacher Well-Being. Collie and colleagues (2015) developed a Teacher Well-Being Scale, which consists of 16 items relating to teachers' experiences at work. The scale measures three factors of teacher well-being: workload well-being (e.g., "Work I complete outside of school hours for teaching"), organizational well-being (e.g., "Support offered by school leadership"), and student interaction well-being (e.g., "Relations with students in my class"). The items were scored on a seven-point Likert-type scale ranging from *Negatively* (1) to *Positively* (7). An internal consistency analysis showed a Cronbach's α of .97 in this study.

Teacher Burnout. Teacher burnout was assessed by the Teacher Burnout Scale developed by Seidman and Zager (1986). It presented teachers with questions about their perspective on teaching on a five-point scale ranging from *Strongly Disagree* (1) to *Strongly Agree* (5). There are four subscales of the instrument: (1) Career Satisfaction; (2) Perceived Administrative support; (3) Coping with Job-Related Stress; and (4) Attitude towards Students. Two subscales (Administration support, α = .84; Stress, α = .80) having 12 items in total were used in the current study. Examples of questions include, "I believe that my efforts in the classroom are unappreciated by the administrators" and "I find it difficult to calm down after a day of teaching." Burnout scores were calculated separately for each subsection, with a higher score suggesting higher burnout feelings (Seidman & Zager, 1986). An internal consistency analysis showed a Cronbach's α of .87 in this study.

Teacher-Student Relationship. Ang (2005) developed and validated a 14-item teacher version of the teacher-student relationship inventory in Singapore. The inventory is a self-report measure that assesses teachers' perceptions of the quality of their relationships with students. Three factors include: *Satisfaction*, which involves feelings of contentment with the relationship and positive regard for the student, *Conflict*, which refers to negative feelings in the relationship (e.g., frustration), and *Instrument help*, which refers to how willing a teacher perceives a student is to seek advice, sympathy, or help from him or her. Reliability (internal consistency) estimates ranged from .81 to .94. Considering the large workload for teachers to fill out the survey for every student, each teacher was asked to select three students from their classes. In China, each student is assigned a student number within the class. To ensure randomness, students with numbers 10, 20, and 30 in their class were picked for teachers to complete the survey. The mean score of the three students is the final score of the teacher-student relationship. An internal consistency analysis showed a Cronbach's α of .95 in this study.

Translation, Linguistic and Cultural Adaptation. An extensive and careful translation process was set up to ensure accurate and culturally appropriate translations that minimize linguistic bias for all the instruments. The translation and adaption process for the new measure was primarily composed of four steps, which were based on suggestions made by Geisinger (1994). A translator and two bilingual experts in K-12 education performed the initial translation from English to Chinese (Mandarin) in a panel. In the panel, they reviewed the items and reacted in writing, shared their comments with one another, met to consider the points made by each other, and reconciled any differences of opinion. Specific terms were adapted to ensure their applicability in China. Then the version was sent to the authors of the original measure to evaluate in two meetings: one without translators and one with translators. For the instruments to

assess teachers' well-being and teacher-student relationship, the authors collaborated with bilingual experts in K-12 education to translate. Then, all the instruments were administered to a small group of the target population, which is the K-12 teachers ($N = 10$) in China. The instruments have been changed in light of these early findings. More details could be found in Appendix C.

Results

Factor Analysis

Factor analyses were used to ascertain the dimensionality of the TEIS. EFA was first conducted, followed by CFA. EFA allows the researcher to discover whether there are any coherent subsets of items and the nature of these subsets (Tabachnick et al., 2007). Once several EFAs were run and an understanding of the factors was obtained, CFA was conducted. Whereas EFA aims to identify the underlying processes that produced correlations between items, CFA aims to test whether the correlations among items are consistent with the hypothesized factor structure provided by the exploration conducted through EFA (Tabachnick et al., 2007). For both EFA and CFA, acceptability of the model is determined by assessing goodness of fit, interpretability of the items, and strength of the parameter estimates (Brown, 2006). In the current study, R package *lavaan* (Rosseel, 2012) was applied to conduct these data analyses.

For EFA, principal component analysis with varimax rotation was used. Prior to conducting EFA, I examined two indicators to determine whether the sample was appropriate for such an analysis. For the teacher-self dimension, the Kaiser-Meyer-Olkin measure of sampling adequacy index was .93, and Bartlett's test of sphericity was significant, $\chi^2(153) = 2441.83$, $p < .0001$, indicating that the sample and correlation matrix were appropriate for the analysis. For teacher-student interaction dimension, the Kaiser-Meyer-Olkin measure of sampling adequacy

index was .95, and Bartlett's test of sphericity was significant, $\chi^2(153) = 3166.05$, $p < .0001$, which also indicate the appropriateness of CFA.

I made decisions about the number of factors to retain on a combination of methods including eigenvalue >1.0, scree plots, as well as conceptual clarity, theoretical salience of the factors, and simple structure. Our goal is to have the smallest number of possible factors and for each item to load on only one latent factor. Items should preferably load greater than 0.40 on the relevant factor and less than 0.40 on all other factors (Stevens, 1996).

Teacher-Self Dimension. Through the running of several EFAs, six items were removed based on the strength of the factor loading (e.g., low loading or cross-loading with other factors) and/or interpretability (e.g., items did not make conceptual sense in relation to the factor on which they loaded; Brown, 2006). This procedure resulted in a 12-item instrument accounting for 69% of the variance in teachers' EI scores of the teacher-self dimension. Fit indices for the final EFA involving 12 items showed the following RMSEA = .012, TLI = .99, and RMSR = .01. These indices suggest that the fiver-factor solution has adequacy to good fit. Table 16 shows the factors, the corresponding items, and the factor loadings. Except for the combination of understand emotions and perceive emotions, the rest of the factors align with the theoretic structure indicated in the previous section.

Table 16

Teacher-Self Dimension's Factor Loadings From the Exploratory Factor Analysis

Item	Loading
Factor 1: Perceive emotions	
1. I am aware of my emotions as I experience them. 当我有情绪的时候， 我会有意识地察觉到它们的存在	0.742
2. I have a good sense of why I feel certain feelings. 我能清晰意识到我向学生传送的非言语信息	0.525
Factor 2: Understand emotions	
3. I know why my emotions change. 我清楚我的情绪的来源和原因	0.774
4. I know why my emotions change. 当我的情绪改变时，我知道为什么	0.861
5. I have a good understanding of my own emotions. 我对自己的情绪非常了解	0.672
Factor 3: Express emotions	
6. I am able to clearly describe my feelings. 我能清楚表达我的情绪	0.683
7. I am able to express myself in a calm way, even if I am upset. 就算我感到情绪波动，我也能平静地表达我自己	0.753
Factor 4: Regulate emotions	
8. When I am angry, I can calm myself down. 我生气时，我能让自己平静下来	0.679
9. I have good control of my emotions. 我能很好把握自己的情绪	0.438
Factor 5: Use emotions	
10. My emotions help me to focus on what is important to me. 我的情绪能让我专注在我觉得重要的事情上	0.864
11. I use my feelings to understand my needs. 我的情绪可以让我了解我的需求	0.790
12. My emotions guide me in difficult situations. 面对困难时，我的情绪可以引导我作出选择	0.648

A CFA was conducted on the other half of the sample to confirm the factor structure revealed in the EFA. Fit indices revealed adequate to good fit of the confirmatory measurement model: $\chi 2$ (44) = 92.816, $p < .001$, RMSEA = .075, CFI = .963, and TLI = .944. Standardized factor loadings from the CFA are shown in Table 17 All of the standardized path coefficients were statistically significant and salient (> .40).

Table 17

Teacher-Self Dimension's Standardized Factor Loadings From the Confirmatory Factor Analysis

Item	Loading
Factor 1: Perceive emotions	
1. I am aware of my emotions as I experience them. 当我有情绪的时候， 我会有意识地察觉到它们的存在	0.712
2. I have a good sense of why I feel certain feelings. 我能清晰意识到我向学生传送的非言语信息	0.625
Factor 2: Understand emotions	
3. I know why my emotions change. 我清楚我的情绪的来源和原因	0.837
4. I know why my emotions change. 当我的情绪改变时，我知道为什么	0.847
5. I have a good understanding of my own emotions. 我对自己的情绪非常了解	0.668
Factor 3: Express emotions	
6. I am able to clearly describe my feelings. 我能清楚表达我的情绪	0.748
7. I am able to express myself in a calm way, even if I am upset. 就算我感到情绪波动，我也能平静地表达我自己	0.841
Factor 4: Regulate emotions	
8. When I am angry, I can calm myself down. 我生气时，我能让自己平静下来	0.811
9. I have good control of my emotions. 我能很好把握自己的情绪	0.919
Factor 5: Use emotions	
10. My emotions help me to focus on what is important to me. 我的情绪能让我专注在我觉得重要的事情上	0.815
11. I use my feelings to understand my needs. 我的情绪可以让我了解我的需求	0.870
12. My emotions guide me in difficult situations. 面对困难时，我的情绪可以引导我作出选择	0.782

CFAs of two competing models were also conducted to compare with the 5-factor model in this study. The competing one-factor model had all 13 items loading on a single factor and the competing four-factor model followed the Four Branches Model of EI (Mayer et al., 1997; Mayer et al., 2016). For the one-factor model, fit indices were reported as follows: $\chi 2$ (65) =

518.142, $p < .001$, RMSEA = .188, CFI = .702, and TLI = .643. For the four-factor model, fit indices were reported as follows: $\chi 2$ (59) = 150.669, $p < .001$, RMSEA = .89, CFI = .94, and TLI = .92. In comparison, model fit was poorer than the 5-factor model for both competing models. The results of the CFA provided further preliminary support for the factor structure of the TEIS scores established in EFA.

Teacher-Student Interaction Dimension. After several rounds of EFAs, five items were removed based on the strength of the factor loading (e.g., low loading or cross-loading with other factors) and/or interpretability (e.g., items did not make conceptual sense in relation to the factor on which they loaded; Brown, 2006). This procedure resulted in a 13-item instrument accounting for 76.5% of the variance in teachers' EI scores of the teacher-student interaction dimension. Fit indices for the final EFA involving 13 items showed the following RMSEA = .053, TLI = .98, and RMSR = .01. These indices suggest that the 5-factor solution has adequacy to good fit. Table 18 shows the factors, the corresponding items, and the factor loadings. Factor loadings align with the hypothetic theory model.

Table 18

Teacher-Student Interaction Dimension's Factor Loadings From the Exploratory Factor Analysis

Item	Loading
Factor 1: Perceive emotions	
1. I am aware of non-verbal message students send. 我能理解学生传递给我的非言语信息	0.608
2. I can guess what students are feeling by observing their facial expression. 通过观察学生的面部表情，我能猜测学生的情绪	0.724
3. I can guess how students are feeling by listening to the tone of their voice. 通过听学生的声音，我能猜测学生的心情	0.808
4. I am good at sensing what students are feeling. 我能感觉到学生的心情	0.716
Factor 2: Understand emotions	
5. I can identify my students' feelings. 我能识别学生的情绪	0.766
6. I am good at understanding how students are feeling. 我能理解学生的感受	0.544
Factor 3: Regulate emotions	
7. I am good at motivating students. 我能鼓励学生	0.734
8. I help students feel better when they are discouraged. 当学生在沮丧时， 我能帮助他/她，让他/她感觉好一些	0.776
Factor 4: Express emotions	
9. When students are upset, I can help them express their feelings effectively 当学生情绪波动时，我能帮助他/她有效表达他/她的感受	0.509
10. I can assist students to articulate their emotions. 我能帮助学生清楚表达他们的情绪	0.645
Factor 5: Use emotions	
11. I am good at predicting how students will feel in certain situations. 我能预测不同情况下学生的情绪	0.689
12. I respond to students' changing emotions by making adjustments in my classroom. 我能根据学生的情绪变化调整教学	0.597
13. I understand the needs behind students' emotions. 我能知道学生情绪背后的需求	0.754

A confirmatory factor analysis (CFA) was conducted on the other half of the sample to confirm the factor structure revealed in the EFA. Fit indices revealed adequate to good fit of the confirmatory measurement model: $\chi 2$ (55) = 81.243, $p < .001$, RMSEA = .049, CFI = .986, and TLI = .981. Standardized factor loadings from the CFA are shown in Table 19 All of the standardized path coefficients were statistically significant and salient (> .40).

Table 19

Teacher-Student Interaction Dimension's Standardized Factor Loadings From the Confirmatory Factor Analysis

Item	Loading
Factor 1: Perceive emotions	
1. I am aware of non-verbal message students send. 我能理解学生传递给我的非言语信息	0.703
2. I can guess what students are feeling by observing their facial expression. 通过观察学生的面部表情，我能猜测学生的情绪	0.730
3. I can guess how students are feeling by listening to the tone of their voice. 通过听学生的声音，我能猜测学生的心情	0.762
4. I am good at sensing what students are feeling. 我能感觉到学生的心情	0.904
Factor 2: Understand emotions	
5. I can identify my students' feelings. 我能识别学生的情绪	0.931
6. I am good at understanding how students are feeling. 我能理解学生的感受	0.851
Factor 3: Regulate emotions	
7. I am good at motivating students. 我能鼓励学生	0.811
8. I help students feel better when they are discouraged. 当学生在沮丧时， 我能帮助他/她，让他/她感觉好一些	0.943
Factor 4: Express emotions	
9. When students are upset, I can help them express their feelings effectively 当学生情绪波动时，我能帮助他/她有效表达他/她的感受	0.895
10. I can assist students to articulate their emotions. 我能帮助学生清楚表达他们的情绪	0.892
Factor 5: Use emotions	
11. I am good at predicting how students will feel in certain situations. 我能预测不同情况下学生的情绪	0.805
12. I respond to students' changing emotions by making adjustments in my classroom. 我能根据学生的情绪变化调整教学	0.843
13. I understand the needs behind students' emotions. 我能知道学生情绪背后的需求	0.826

CFAs of two competing models were also conducted to compare with the 5-factor model in this study. The competing one-factor model had all 13 items loading on a single factor and the

competing four-factor model followed the Four Branches Model of EI (Mayer et al., 1997; 2016). For the one-factor model, fit indices were reported as follows: $\chi 2$ (65) = 381.185, p < .001, RMSEA = .157, CFI = .834, and TLI = .801. For the four-factor model, fit indices were reported as follows: $\chi 2$ (59) = 122.208, p < .001, RMSEA = .074, CFI = .967, and TLI = .956. In comparison, the model fit was poorer than the 5-factor model for both competing models. The results of the CFA provided further preliminary support for the factor structure of the TEIS scores established in EFA.

Internal Validity

The reliabilities were assessed by Cronbach's α, which is used to measure the internal consistency of the new measure (Cortina, 1993). A higher coefficient alpha reflects a higher expectation of reliability of the measure and a higher consistency in the results across items in the test. In the current study, the internal consistency estimates were respectively 0.89 on the 5-factor self-dimension subscale, and 0.95 on the 5-factor teacher-student interaction dimension subscale (Table 20).

Table 20

Means for Teacher Emotional Intelligence Scale Dimensions and Total Score

Dimensions	*M*	*SD*	α
TEIS	3.828	0.494	0.95
Teacher-self dimension	3.742	0.543	0.89
Teacher-student interaction dimension	3.907	0.527	0.95

Convergent and Discriminant Validity

The two samples were combined to evaluate the convergent and discriminant validity of the test through a nomological network. The relationship among teachers' EI, teacher self-efficacy, teacher well-being, teacher burnout, and teacher-student relationship were tested. To

obtain convergent evidence and discriminant evidence of validity, several different hypotheses were elaborated.

First, according to the literature, teachers' perspective of self-efficacy is positively correlated with teachers' EI (Jia & Zhu, 2014; Xiao, 2016; Yang, 2009), so it is expected that the teachers' EI will have a positive relationship with teacher self-efficacy (Hypothesis 1). Second, studies have found that important indicators of teacher well-being like job satisfaction (Gao et al., 2013; M. Li, 2011; Wong et al., 2010; Xie, 2014; Yin et al., 2013), sense of self-achievement (C. Wang, 2013), and professional commitment (Duan, 2010) are positively correlated with teachers' EI. Thus, the second hypothesis is that teachers' EI will have a positive relationship with teacher well-being. Third, according to the literature, teaching can be a stressful job and the higher the teachers' EI, the lower the burnout is tended to be reported (Chan, 2006; He, 2011; Ju et al., 2015; C. Wang, 2013; Yao & Guan, 2013; X. Zhang, 2012). Therefore, the third hypothesis is that teacher burnout will be negatively correlated with teachers' EI. Furthermore, Sun et al.'s (2015) found that teachers' EI is significantly correlated with teacher-student relationship. Hence, the fourth hypothesis is that teachers' EI is positively correlated with teacher-student relationship.

As predicted, teachers' EI scores were positively correlated with teacher well-being scores ($r = .45$, $p < .001$), teacher self-efficacy ($r = .63$, $p < .001$), and teacher-student relationship ($r = .46$, $p < .001$). There is also a negative association found between teachers' EI and teacher burnout scores ($r = –.2$, $p < .001$). The magnitude of the correlations was moderate to large (J. Cohen, 1988), suggesting that teachers' perception of EI was at least moderately associated with teacher well-being, teacher self-efficacy, teacher-student relationship, and teacher burnout. For the two dimensions, the self-dimension of teachers' EI shows significant

positive relationships with teacher well-being ($r = .37$, $p < .001$), teacher self-efficacy ($r = .50$, $p < .001$), and teacher-student relationship ($r = .37$, $p < .001$). There is also a significant negative relationship between teachers' EI and teacher burnout ($r = -.17$, $p < .001$). Similar findings are also reported in the teacher-student interaction dimension as: significant positive relationships with teacher well-being ($r = .45$, $p < .001$), teacher self-efficacy ($r = .67$, $p < .001$), and teacher-student relationship ($r = .48$, $p < .001$), with a significant negative relationship with teacher burnout ($r = -.20$, $p < .001$).

Discussion

The purpose of the present investigation was to validate the scores from a brief self-report inventory to measure teachers perceived emotional intelligence from two dimensions, self and the interaction between teachers and students in China.

In the current study, the sample was K-12 teachers from different cities in China. Findings from EFA conducted in the first study ($N = 197$) indicated that the TEIS scores have five distinct factors for both dimensions that were labeled Perceive emotions, Understand emotions, Regulate emotions, Express emotions, and Use emotions. This 5-factor and two-dimension structure of TEIS scores was confirmed via ($N = 197$) CFA. Multiple fit indices provided support that the hypothesized 5-factor model for the TEIS scores had a good fit with the data. Fit indices associated with both the competing one-factor and four-factor models suggested poor fit, thus providing additional support for the 5-factor model of TEIS scores in China. In addition, the TEIS was found to have scores that were internally consistent, and the magnitude of these Cronbach alpha estimates appears adequate for general research purposes (Henson, 2001; Nunnally & Bernstein, 1994).

Based on limited preliminary evidence, TEIS scores do appear to exhibit reasonable levels of convergent and discriminant validity in the samples examined. Consistent with previous research, both dimensions of TEIS were positively associated with teacher well-being, teacher self-efficacy, teacher-student relationship and negatively associated with teacher burnout. These effects were moderate to large in magnitude (J. Cohen, 1988), providing some evidence for the convergent and discriminant validity of TEIS scores.

The emergence of five factors is consistent with my EI theoretical model. Findings from the present study provide additional support that teachers' EI has the potential to protect teachers' mental health through increasing well-being as well as decreasing burnout. Meanwhile, a higher level of teachers' EI is associated both with a higher level of teacher self-efficacy and a positive teacher-student relationship. These relationships also point out the potential of teachers' EI to improve teacher effectiveness. Thus, the two dimensions of teachers' EI contribute to not only teacher well-being but also teacher effectiveness, which are critical for student achievement and school success.

Conclusion

In conclusion, the current study conducted a mixed-method study to gain a more comprehensive understanding of teachers' EI in China and validate the TEIS in China with a sample of K-12 teachers. The phenomenological qualitative study provides a picture of teachers' EI from the perspective of elementary teachers in China. Findings show that elementary teachers' EI in China have a good understanding of EI, which is align with my EI construct and theoretical framework. The identified factors of teachers' EI include the ability to perceive, regulate, use, understand, and express emotions. The study also highlights the need for careful clarification of the concept of EI/Qingxuzhili to avoid potential misunderstandings. These

findings provide a strong foundation for understanding EI in the context of teachers in China. The research also supports the cultural adaptation of the TEIS for use with Chinese teachers. Additionally, the quantitative research has presented the initial evidence of the reliability and validity of the obtained scores from TEIS, which suggests that this measure can be useful for assessing teachers' EI in China. These results not only add to the existing literature on measuring EI in teachers, but also contribute to the broader understanding of EI in diverse cultural contexts.

What's more, both qualitative and quantitative studies highlight the importance of teachers' EI. In qualitative study, elementary teachers reach a consensus that teachers' EI has significant impact on various aspects of their professional lives, such as classroom management, teaching, teacher-student relationship, and students' EI and achievement (M. Chen, 2019; G. Li, 2012; Sun et al., 2015). In quantitative study, findings provide additional support that teachers' EI can have a protective effect on their mental health by increasing well-being as well as decreasing burnout. Meanwhile, a higher level of teachers' EI is associated both with a higher level of teacher self-efficacy and a positive teacher-student relationship. These relationships suggest that EI has the potential to improve teacher effectiveness, which is crucial for student achievement and school success. As such, the Teachers' EI scale is a practical measure that holds promise for helping teachers, school administrators, and policymakers to understand and, potentially, guide efforts to improve teachers' EI in China.

Limitations

There are several limitations to this study that must be discussed. For the qualitative study, the sample number is limited. All the participants were female elementary teachers. The homogeneity of the participants provided consistency but could restrict differences. For the quantitative study, first, due to the nature of the online data collection, it was not possible to

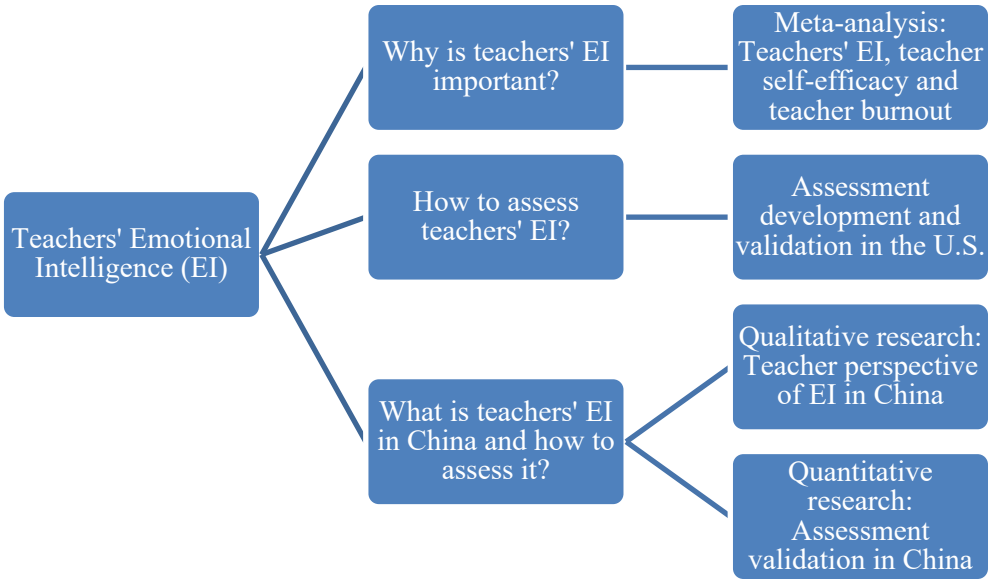
ascertain exact response rates raising questions about the representativeness of the data, but online data collection does have several strengths including its broad reach and lower cost. Second, self-report questionnaires rely on participants' accurate interpretations of the items. Though the items were designed with straight-forward and non-pejorative language to increase the likelihood of truthful responses (Simms, 2008), it is important to report the result with representative language (e.g., teachers perceived, reported, experienced) to clarify that the data refer to self-reports. Third, social desirability could be another threat to the validity of self-reports. Relying on only one source of data potentially puts findings threatened by single source bias. In this case, social desirability might decrease the validity of the data. Fourth, the relationship between teachers' EI and student academic achievement could be influenced by different assessments. Fifth, though nomological network may work as a philosophical foundation for construct validity, it does not provide a practical and usable methodology for assessing construct validity. Future studies could apply multitrait-multimethod matrix to move a bit further toward a methodological approach to construct validity. Further research on establishing the validity of TSRI scores using a variety of measures (e.g., behavioral measures is still needed.

CHAPTER 5: General Discussion

The aim of this dissertation study was to provide a comprehensive examination of teachers' emotional intelligence (EI). Three related studies were conducted: a meta-analysis to understand the importance of teachers' EI, a measure developed and tested to assess teachers' EI, and an exploration of teachers' EI's definition and assessment in a different cultural context (Figure 5).

Figure 5

Overview of Three Studies



More specifically, the first study involved summarizing effect sizes in current literature related to teachers' EI, teacher well-being, and teacher effectiveness. Due to the limited related studies, teacher burnout was adopted as the indicator of teacher well-being while teacher self-efficacy was applied as the indicator of teacher effectiveness. Results revealed that there is a

positive relationship between teachers' EI and teacher self-efficacy while a negative relationship between teachers' EI and teacher burnout. These findings echo the discussions about teachers' EI's importance in the literature. However, meta-analyses did not report any significant relationship between Stream 1 EI measures that are ability EI tests based on Mayer and Salovey's model (1997) and teacher self-efficacy or teacher burnout. In the current study, it might be caused by the small sample size. Future studies are recommended to explore the reasons when more studies are available.

The second study involved developing and testing the Teachers' Emotional Intelligence scale (TEIS) based on teachers' experiences at work. Results revealed a four-factor structure of teacher-self dimension and a 5-factor structure of teacher-student interaction dimension in the United States. The only difference between the two dimensions is whether Perceive emotions and Understand emotions are combined or not. For the teacher-self dimension, both factors load together. However, for the teacher-student interaction dimension, they have been found as two distinct factors. Besides, the rest three factors are: Regulate emotions, which refers to regulating self-emotions as well as helping students to regulate their emotions; Express emotions, which refers to expressing self-emotions accurately as well as helping students to express their emotions; and Use emotions, which refers to using emotions to understand self and student's needs as well as using emotions to direct behaviors. Furthermore, internal consistency estimates and correlational analyses provided support for the teachers' EI measure by showing that it was related as expected with two other measures: teacher well-being and teacher burnout. The new measure provides a relatively simple and efficient way to assess teachers' EI from teachers' perspectives in their professional settings.

The third study involved examining and testing the TEIS in China through mixed methods. The results not only provided support for the universal definition of teachers' EI in the United States and China through qualitative methods, but also tested TEIS reliability and validity in China. Similar to the second study, results revealed a 5-factor structure for both teacher-self dimension and teacher-student interaction dimension. Correlational analyses provided support for the teachers' EI measure by showing that it was related as expected with four other measures: teacher well-being, teacher self-efficacy, teacher-student relationship, and teacher burnout. This study shows that TEIS could be used to assess teachers' EI in China.

Taken together the findings from these three studies advance knowledge in the field of teachers' EI. Before discussing the major contributions of the dissertation research, however, several findings refer to the dissertation as a whole and warrant discussion. The first was support found for the TEIS developed in the second study. Factor analyses and correlations in the second study and the third study provided validity evidence based on internal structure and relationships to other variables. Future research is still needed to measure among different samples and in relation to other constructs to provide further evidence of validity. For example, a more novice K-12 in-service teachers in China, and K-12 in-service teachers outside of Virginia, United States. The findings also provided support for a multidimensional construct of teachers' EI that has extended our understandings. It highlights the value of allowing teachers to respond in two important dimensions of their work.

The second finding relevant across the research as a whole was the relationship among teachers' EI, teacher self-efficacy, teacher well-being, and teacher burnout. The results of the first study, second study, and third study revealed a comprehensive picture of these relationships in two different cultures, the United States and China. All of them reported positive relationships

between teachers' EI and respectively teacher self-efficacy and teacher well-being. A negative relationship between teachers' EI and teacher burnout has also been pointed out by all the studies.

The third finding reflected across the three studies was the influence of culture on teachers' EI. While some scholars argue that culture may not influence EI (Mayer et al., 2002), scholars have suggested that cultural dimensions interact with an individual's ability to understand, regulate, and address emotions (Fernández-Berrocal et al., 2005; Ryan et al., 2012). In the current study, potential differences that may be caused by culture in teachers' EI have been identified in meta-analyses. In addition, in the second study with teachers in the U.S. and in the third study with teachers in China, the factor structure is a little different. It might be the reason that cultural values directly influence EI or its dimensions (Pathak & Muralidharan, 2020). Although Chinese elementary teachers have reported a shared understanding of the EI definition that developed in the western culture, they also share they will intentionally hide their real emotions in front of students. This finding aligns with the literature that Easterners are less pronounced than Westerners (Arens et al., 2013; Shao et al., 2015). Thus, EI measures that developed with a performance format need to be used carefully in a diverse cultural context. It is also important to interpret EI from a cross-cultural perspective since culture may cause individual differences.

To build upon current findings, it is important to continue exploring the conceptualization of teachers' EI. TEIS was built aiming at assessing teachers' EI in their professional settings, but more questions still remain unclear on how the teachers' EI relates to teachers' personal lives. In current studies, I only include the most core elements of teaching, which are teachers' perceptions about their own EI and teacher-student interactions. However, the process of

teaching is significantly more complex than the simple transmission of information, as it involves a multitude of variables that interact in a dynamic manner. It will be helpful to check if some other aspects need to be highlighted in teachers' professional lives, such as teacher-principal interaction. In addition, since emotions might be influenced by cultures, though the current study examined the teachers' EI in two distinct cultural contexts, a closer look at the conception in more diverse environments is recommended. In addition, more validation of the TEIS is needed. The current study only examines TEIS in three groups of K-12 in-service teachers. It is important to examine the measurement equivalence of TEIS across more demographic groups (e.g., age, gender, culture) in the future to ensure that differences in responses are interpreted in a meaningful and unbiased manner. Further, more research in the teachers' EI field is highly recommended, which could help us to identify a more accurate estimate of the potential of teachers' EI. With more studies available in the field of teachers' EI, performing a moderator analysis will help determine the factors that contribute to the heterogeneity of the meta-analyses results.

Implications

The findings of this dissertation research also provide several important contributions to practice and theory. First, I hope that the findings will help to cultivate awareness of the importance of teachers' EI, and in turn, promote teacher well-being and effectiveness. In the current study, several relationships have been revealed regarding teachers' EI, well-being, self-efficacy, burnout, aggression, and teacher-student relationship. These relationships provide a framework through which school administrators, policymakers, researchers, and teachers themselves can better understand teachers' EI. It also describes how these experiences are affected by and, in turn, affect other experiences such as teacher well-being and effectiveness.

Consequently, these findings have the potential to not only help guide efforts to promote positive work experiences among teachers but also propose a new approach to improve teacher effectiveness and further impact students. For policymakers and school administrators, they can provide EI training to support in-service teachers to improve their well-being. How to improve teacher well-being is a crucial topic after the pandemic. With appropriate training, teachers could develop EI skills to be able to identify and view stressors as challenges that they feel empowered to tackle, rather than feeling overwhelmed and defeated by these stressors (Mikolajczak & Luminet, 2008; Vesely et al., 2013). The extent to which teachers can access and utilize personal resources and external supports will add to their ability to cope with the myriad of demands (Ju et al., 2015).

Moreover, studies show teachers' EI's potential to improve teacher effectiveness (Akram et al., 2019; Taseer, 2020) as well as student achievement (Curci et al., 2014; Nizielski et al., 2012; Pozo-Rico & Sandoval, 2020;). Thus, teachers' EI training can improve teachers' EI skills and may further benefit students academically and psychologically. Teachers are the engines that drive SEL programs and practices as well as play a central role in students' cognitive and social-emotional development (Phelps & Benson, 2012). In fact, teachers' EI plays an important role in individual behavior differences in the implementation of SEL, such as recognizing and managing emotions, developing care and concern for others, and coping effectively with confrontations. Thus, teachers not only need to have knowledge of how to teach SEL, but their own EI is also important to creating a supportive environment (Jones & Bouffard, 2012), encouraging teacher-student relationships (Jennings & Greenberg, 2009), and therefore further improving students' social emotional learning (Milkie & Warner, 2011; Skura & Świderska, 2021). Thus, teachers' EI training has the potential to enhance the quality of social-emotional learning programs and

further student psychological development. Most importantly, studies have shown that teachers' EI training could improve their EI competencies and related behaviors These shifts had a positive impact on their practice (Dolev & Leshem, 2016; Hen & Sharabi-Nov, 2014; Pozo-Rico et al., 2020).

Teacher preparation programs could include EI-related curricula and practices to better equip pre-service teachers with needed skills in future work. EI is also important for pre-service teacher well-being, engagement in learning, academic achievement, interpersonal relationships, course satisfaction, psychosocial development, and successful classroom teaching experiences (Caires et al., 2012; Wurf & Croft-Piggin, 2015). Pre-service teachers are required to use EI skills in a variety of situations such as adapting to new situations, innovating and problem-solving, leading groups, and assisting students (Caires et al., 2012).

The second contribution is relevant to the development of the TEIS. Since TEIS was developed based on the teacher's professional context as a self-report measure, it means that it can be used to inform practice in a more efficient and reliable way. In addition, TEIS has been refined and tested in two distinct cultural environments, China and the U.S., which allows TEIS to reach its full potential in a cross-cultural environment. Thus, TEIS could be used by school administrators, policymakers, and even teachers themselves to understand what aspects of teachers' EI influence their teaching, self or teacher-student interaction. The differentiated assessments of specific EI competencies enable them to assess more multidimensional, and person-centered predictive models. While extending our understanding of teachers' EI, possible uses of the TEIS also extend to diagnosis and intervention. Further, with TEIS, we can assess teachers' EI in a more accurate way to create better EI trainings for our teachers.

Conclusion

Overall, this dissertation research has important implications for research and practice regarding teachers' EI. Findings revealed the importance of teachers' EI for both their well-being and effectiveness, which impacts quality in carrying out teaching-learning processes in the classroom, and in particular for the socio-emotional development of students (Sutton & Wheatley, 2003). However, it is also important to mention that many of these implications ultimately relate to students and schools as well. The contributions of the dissertation to our understanding of teachers' EI extend to students given that these variables are related to teaching effectiveness (Akram et al., 2019; Taseer, 2020); teacher job satisfaction (Wong et al., 2010; Yin et al., 2013); teacher performance (Go et al., 2020; Wu et al., 2019); and students' academic learning and psychological development (Freeman & Strong, 2017). Furthermore, the practical implications and applications that this dissertation research can help promote and guide also have the potential to affect teachers, students, and schools in positive ways. Future research that more directly examines links between the constructs examined in this dissertation (e.g., teacher well-being, teacher self-efficacy) and student outcomes will help to extend our knowledge of how teachers' experiences relate to students' outcomes and, ultimately, how we can best support students' academic, social, and emotional development.

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Appendix A. Questionnaire for Study 2

Purpose: This study is designed to explore the K-12 teachers' Emotional intelligence and its relationship with teacher well-being and burnout.

Procedures/Tasks: By choosing to participate in this survey, you will be directed to an anonymous online survey. The survey will ask you to respond to a series of questions.

Duration: The online survey will take 10 to 12 minutes to complete. You can leave the study at any time.

Risks and Benefits: There will be no direct benefit to you for participating in the study. However, your responses will provide a deeper understanding of teacher emotional intelligence.

Confidentiality:

- The confidentiality of your personally identifiable information will be protected to the maximum extent allowable by law.
- Your name and other identifiable information will be known only to the research through the information that you provide.
- Neither your name nor any other personally identifiable information will be used in any presentation or published work without prior written consent.
- The recording of the scales described above will be erased after the study is complete. You may refuse to answer any questions on the scales if you so choose.
- You may terminate your participation in the study at any time.
- Any action of refusal or termination will not incur a penalty of any type with William & Mary or your school division.
- Your participation in this study is completely voluntary.

Contact

If you feel you have not been treated according to the descriptions in this form, or you have any questions, concerns, or complaints that you wish to address to someone other than the investigator, you may contact Professor Thomas Ward via phone at 757-221-2358 or via email at tjward@wm.edu.

Please select your choice below. Clicking on the "Agree" button indicates that

· You have read the above information

· You voluntarily agree to participate

If you have any questions about the survey, please email us: khuang04@email.wm.edu

○ Agree

○ Disagree

Section 1: Demographics

1. How many years have you been teaching?

   ☐ Fewer than 3 years

   ☐ 3-6 years

   ☐ 7-10 years

   ☐ 11-15 years

   ☐ 16-20 years

   ☐ More than 20 years

2. What is your gender?[1]

   ☐ Female

   ☐ Male

   ☐ Non-binary/ third gender

☐ Prefer to self-describe _____

3. What's your highest educational degree?

☐ Doctoral degrees

☐ Master degrees

☐ Bachelor degrees

☐ Specialists

☐ Other: _____.

Section 2: Teacher Emotional Intelligence

Please indicate your opinion about each of the statements below by marking any one of the five responses in the columns on the right side, ranging from (1) "Never" to (5) "Always" as each represents a degree on the continuum.

o Never o Seldom o Sometimes o Most of the time o Always

1. I am aware of my emotions as I experience them.
2. I am aware of the non-verbal messages I send to students.
3. I have a good sense of why I feel certain feelings.
4. I know why my emotions change.
5. I have a good understanding of my own emotions.
6. I am able to clearly describe my feelings.
7. When I experience a positive emotion, I know how to make it last.
8. I'm able to deal with stress effectively.
9. When I am angry, I can calm myself down.

10. I have good control of my emotions.

11. I can articulate how I am feeling.

12. I can put my emotions into words.

13. I am able to express my emotions effectively.

14. I am able to express myself in a calm way, even if I am upset.

15. My emotions inform me about changes I should make.

16. My emotions help me to focus on what is important to me.

17. I use my feelings to understand my needs.

18. My emotions guide me in difficult situations.

19. I am aware of non-verbal message students send.

20. I can guess what students are feeling by observing their facial expression.

21. I can guess how students are feeling by listening to the tone of their voice.

22. I am good at sensing what students are feeling.

23. I can understand why students feel the way they do.

24. I can identify my students' feelings.

25. I am good at understanding how students are feeling.

26. I can help students to regulate their emotions.

27. I am good at motivating students.

28. I help students feel better when they are discouraged.

29. When a student comes to class feeling angry, I can help him/her to calm down.

30. When students are upset, I can help them express their feelings effectively.

31. I can assist students to articulate their emotions.

32. I can create a classroom community where students feel safe to express their emotions.

33. I am good at predicting how students will feel in certain situations.

34. I respond to students' changing emotions by making adjustments in my classroom.

35. I understand the needs behind students' emotions.

36. Students confide in me.

Section 3: Teacher Burnout

Please rate the following statements from 1 = strongly disagree and 5 = strongly agree.

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
1. I get adequate praise from my supervisors for a job well done.					
2. I feel that the administrators are willing to help me with classroom problems, should they arise.					
3. I believe that my efforts in the classroom are unappreciated by the administrators.					
4. My supervisors give me more criticism than praise.					

5. I feel that administrators will not help me with classroom difficulties.					
6. The administration blames me for classroom problem.					
7. I feel depressed because of my teaching experiences.					
8. The teaching day seems to drag on and on.					
9. My physical illnesses may be related to the stress in this job.					
10. I find it difficult to calm down after a day of teaching.					
11. I feel that I could do a much better job of teaching if only the problems confronting me were not so great.					
12. The stresses in this job are more than I can bear.					

Section 4: Teacher Wellbeing

Currently, how do the following aspects of being a teacher affect your well-being as a teacher? Well-being refers to open, engaged, and healthy functioning as a teacher.

	Negatively (1)	Mostly Negatively (2)	More Negatively than Positively (3)	Neither Positively nor Negatively (4)	More Positively than Negatively (5)	Mostly Positively (6)	Positively (7)
Marking work							
Relations with administrators at my school							
Student behavior							
Fitting everything into the allotted time							
Support offered by school leadership							
Relations with students in my class							
Administrative work related to teaching							
Recognition for my teaching							
Student motivation							

Work I complete outside of school hours for teaching							
School rules and procedures that are in place							
Working to finish my teaching tasks							
Communication between members of the school							
Classroom management							
Staying late after work for meetings and activities							
Participation in school-level decision making							

Thank you for the completion of the survey. For any additional comments or questions, please send an email to the researcher, Ke Huang (khuang04@wm.edu).

Appendix B. Screening Survey for Study 3

1. How many years have you been teaching 请问您的教龄是？

   ☐ Fewer than 3 years 少于 3 年

   ☐ 3-6 years 3 到 6 年

   ☐ 7-10 years 7 到 10 年

   ☐ 11-15 years 11 到 15 年

   ☐ 16-20 years 16 到 20 年

   ☐ More than 20 years 超过 20 年

2. What is your gender 请问您的性别是？

   ☐ Female 女

   ☐ Male 男

   ☐ Prefer to self-describe 其他_____

3. What's your highest educational degree 请问您的学历是？

   ☐ Doctoral degrees 博士研究生

   ☐ Master degrees 硕士研究生

   ☐ Bachelor degrees 本科生

   ☐ Other 其他: _____.

4. Where do you teach now? 请问您在哪里就职_____

5. Your age 您的年龄_____

6. How many classes you teach for week (45 minutes for each class) 请问您一周工作教授几节课（按照 45 分钟一节课计算）？_____

Appendix C. Questionnaire for Study 3

感谢您参与此次问卷调查！以下内容会更好地帮助您了解本次调研。

本次调研目的： 更好地理解中小学老师的情绪智力与其对教师幸福感，职业倦怠，教师自我效能感, 和师生关系的影响。

调研过程： 如果您选择参与此次调研，您将被引导至匿名在线调查。您只需选择您最倾向的答案，全程为单项选择。

调研时长：大约需要 15 到 20 分钟。

风险与收益：参加此次调研您可能没有直接的收益。但是您的参与会让我们更好的了解教师情绪智力，这对以后的相关研究至关重要。

保密性：

- 您个人可识别信息的保密性将受到法律允许的最大程度的保护。
- 只有通过您同意，研究者才能知道您的姓名和其他可识别信息。
- 未经事先书面同意，您的姓名或任何其他个人身份信息都不会用于任何演示或发表文章。
- 研究完成后，所有的记录会被删除。
- 您有权利拒绝回答任何问题。
- 您有权利随时终止参与研究。
- 任何拒绝或终止的行为不会招致任何形式的处罚。
- 您参与此项研究完全是基于自愿。

联系方式：如果您觉得作为研究参与者的权利在本项目过程中未得到尊重，或有任何问题疑虑，您可以拨打电话 +1 (757)221-2358 或通过电子邮件 tjward@wm.edu 联系 Thomas Ward 教授。与调查问卷相关的任何问题，您可以通过电子邮件联系我们：khuang04@email.wm.edu 或 mxtsch@wm.edu。

如果您已经阅读以上内容并且愿意参加本次调查问卷，请您点击“同意”。

我们非常感谢您的参与！

Section 1：背景问题

37. 请问您的教龄是？

☐ 3 年以下

☐ 3-6 年

☐ 7-10 年

☐ 11-15 年

☐ 16-20 年

☐ 20 年以上

38. 请问您的性别是?

☐ 女

☐ 男

☐ 其他 _____

39. 请问您的最高学历是?

☐ 博士研究生

☐ 硕士研究生

☐ 大学本科

☐ 专科

☐ 高中

☐ 其他: _____.

Section 2: 教师情绪智力

教师情绪智力是指涉及人们感知、表达、理解和管理自己以及他人情绪的方式的一组能力。请根据您在右侧栏中标记五个答案中的任何一个来表明您对以下每个问题的看法，范围从（1）“从来没有”到（5）“总是”。您的反馈有利于我们更好了解教师情绪智力。

1. 当我有情绪的时候， 我会有意识地察觉它们的存在
2. 我能清晰意识到我向学生传送的非言语信息
3. 我清楚我的情绪的来源和原因
4. 当我的情绪改变时，我知道为什么
5. 我对自己的情绪非常了解
6. 我能准确描述我的情绪
7. 当我有积极的情绪时，我知道怎样让它们更加持久
8. 我能有效处理我的压力
9. 当我生气时，我能让自己平静下来
10. 我能很好把握自己的情绪
11. 我能清楚表达我的情绪
12. 我能用语言表达我的情绪

13. 我能有效表达我的情绪

14. 就算我感到情绪波动，我也能平静地表达我自己

15. 我的情绪能告诉我我是否需要改变

16. 我的情绪能让我专注在我觉得重要的事情上

17. 我的情绪可以让我了解我的需求

18. 面对困难时，我的情绪可以引导我作出选择

19. 我能理解学生传递给我的非言语信息

20. 通过观察学生的面部表情，我能猜测学生的情绪

21. 通过听学生的声音，我能猜测学生的心情

22. 我能感觉学生的心情

23. 我能理解为什么学生会有那些情绪

24. 我能识别学生的情绪

25. 我能理解学生的感受

26. 我能帮助学生管理他们的情绪

27. 我能鼓励学生

28. 当学生在沮丧时， 我能帮助他/她, 让他/她感觉好一些

29. 当学生在课上生气时，我能帮助他/她平静下来

30. 当学生情绪波动时，我能帮助他们有效表达他/她的感受

31. 我能帮助学生清楚表达他们的情绪

32. 我能建立一个良好的课堂氛围让学生可以放心表达他们的情感

33. 我能预测不同情况下学生的情绪

34. 我能根据学生的情绪变化调整教学

35. 我能知道学生情绪背后的需求

36. 学生们信任我

Section 3: 教师幸福感

就目前而言，以下方面如何影响您作为老师的幸福感？

幸福感在这里指，您可以保持开放，积极地， 健康地履行作为老师的责任。

	负面地（影响幸福感）(1)	大部分时间负面地 (2)	负面影响比正面多 (3)	中立 (4)	正面影响比负面多 (5)	大部分时间正面地 (6)	正面地 (7)
批改作业							
在学校与行政人员/上司之间的关系							
学生的行为							
在规定的时间内完成所有工作量							
学校领导的支持							
与学生之间的关系							
与教学相关的行政工作							
他人对我教学的认可							

学生是否有学习的

动力

我在正常工作时间

之外完成的教学工

作

学校行政规定和程

序

完成我的教学任务

学校人员之间的交

流

课堂管理

下班后的会议与活

动

参加校级决策管理

Section 4: 教师自我效能感

请通过 9 个答案中的任何一个来表示您对以下每个陈述的看法，从“一点儿也不行”（1）到“完全可以”（9）

1. 我能掌控课堂中学生干扰教学的行为
2. 我能提高学习兴趣不高的学生的学习积极性。
3. 我能让吵闹或者干扰上课的学生安静下来
4. 我能帮助学生了解学习的重要性
5. 我能向我的学生提出好的问题

6. 我能让学生遵守课堂规范

7. 我能帮助学生建立信心，完成学校作业

8. 我能针对学生的不同特点，建立不同的班级管理方式

9. 我能使用多样策略来评估学生的学习成果

10. 当学生没听懂时，我能换一种方式讲解

11. 我能协助家长帮助他们的孩子更好地学习

12. 我能采用多种教学方式

Section 5: 教师职业倦怠

请根据您的自身经历，判断以下描述：

	非常不同意	部分不同意	不同意也不反对	部分同意	非常同意
当我的工作做得很好时，我会得到上司的充分表扬					
如果出现关于课堂的问题，我觉得上司会愿意帮助我					
我认为我上课的努力没有得到上司的赏识					
我的上司对我的批评多于表扬					
我觉得上司不会帮助我解决我在课堂上遇到的困难					

当课堂出现问题时，我的 上司会指责我
我会因为我的当老师的经 历而感到消沉
教书的日子好像越来越难 熬
我的身体疾病可能与这份 工作的压力有关
经过一天的教学，我发现 我很难让自己平静下来
我觉得只要我面临的问题 不是那么严峻，我就能把 教学工作做得更好
这份工作的压力超出了我 的承受能力

Section 6: 师生关系

请您分别为班上学号为 10，20，30 的同学回答以下问题（若没有学号或者学号不足 30，请您任意选择三位同学）请通过 5 个答案中的任何一个来表示您对以下每个陈述的看法，从“几乎不符合”（1）到“几乎都符合”（5）

1. 学号 10/20/30：我喜欢班上有这个学生
2. 学号 10/20/30：如果这个学生在家里遇到了问题，他/她很可能会寻求我的帮助

3. 学号 10/20/30：我会认为我和这个学生的关系是融洽的

4. 学号 10/20/30：与班上的大多数学生相比，这个学生更常常让我感到沮丧

5. 学号 10/20/30：如果这个学生缺席了，我会想念他/她

6. 学号 10/20/30：这个学生与我分享他/她的个人生活

7. 学号 10/20/30：我迫不及待地等今年结束，这样我明年就不用教这个学生了

8. 学号 10/20/30：如果这个学生今天缺席了，我会感到轻松

9. 学号 10/20/30：如果这个学生需要帮助，他/她很可能会向我寻求帮助

10. 学号 10/20/30：这个学生会找我倾诉或寻求情感支持

11. 学号 10/20/30：如果这个学生不在我的课堂上，我会更享受我的课堂

12. 学号 10/20/30：这个学生依赖我的建议或帮助

13. 学号 10/20/30：我对我和这个学生的关系很满意

14. 学号 10/20/30：我喜欢这个学生

VITA

Ke Huang

khuang04@wm.edu

EDUCATION

William & Mary School of Education — Ph.D.'22, K-12 Administration

New York University — MSW.'17, Social Work

Shanghai University — B.A.'15, Chinese Language and Literature

EXPERIENCE

Amboss — **New York City**

User Researcher — 2022-Present

William & Mary School of Education — **Williamsburg, VA**

Graduate Assistant, School of Education — 2018-2022

Editor, the William & Mary Educational Review — 2019-2022

AWARDS AND RECOGNITION

Holmes Scholar — 2018-2022

Sternberg Family Scholarship — 2018-2020

Educational Leadership International Student Scholarship — 2018

PEER REVIEWED PUBLICATIONS (selected)

Gareis, C. R., McMillan, J. H., Smucker, A., & **Huang, K.** (2021). *MAP Growth validation study: An evaluation of the alignment of selected MAP growth assessments to the Virginia Standards of Learning and an exploration of the utility of MAP Growth reports for determining student performance relative to grade level* (Report No. ED61869). https://eric.ed.gov/?id=ED618690

Stronge, J. H., Xu, X., Grant, L. W., Mo, Y., & **Huang, K.** (2021). Conceptions of teacher effectiveness and its implications for educational policy and practice in the United States. In L. Grant, J. Stronge, & X. Xu (Eds.). International beliefs and practices that characterize teacher effectiveness (pp. 245-274). IGI Global.

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