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Efficacious and Positive Teachers Achieve More: Examining the Relationship Between Teacher Efficacy, Emotions, and Their Practicum Performance

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Abstract This study will examine the relationship between pre-service teachers' efficacy, emotion, and practicum performance score. A sample of 963 pre-service teachers was approached from four universities in China. This study used two self-reported instruments (The Teachers' Sense of Efficacy Scale and the Teacher Emotion Inventory) and the participants' practicum performance scores to test the relationship. Data were dealt using exploratory factor analysis, confirmatory factor analysis, and structural equation modelling. As expected, the structural model generally shows that pre-service teachers' efficacy significantly predicts their practicum performance through their emotions. Teachers with a higher level of efficacy on Instructional Strategies positively predict their practicum performance through more pleasant emotions such as Love and Joy. By contrast, pre-service teachers with a lower level of confidence of Student Engagement tend to experience more unpleasant emotions (e.g. Fear, Sadness, and Anger) and gain lower practicum performance. One interesting link identified is between the efficacy factor Classroom Management and negative emotion Sadness. On the top of these, three emotion dimensions had been identified to relate to their practicum scores, that is, Joy, Love and Anger. The findings concerning the three constructs can provide a new perspective for teacher effectiveness

research by taking teacher emotion and efficacy into account.

Introduction

A growing body of research has investigated teacher emotion (Fried et al. 2015). Emotion has been identified as a crucial factor that influences how successful individuals are in managing their personal and professional lives (Yin et al. 2017) and effectiveness (Day and Qing 2009). However, most research on teacher emotion focused on its effects on teachers' well-being indicators (e.g. burnout and job satisfaction) and classroom lives, but few studies investigated how teacher emotion relates to their efficacy and effectiveness (Yin et al. 2017). Even fewer studies focused on pre-service teachers' emotions (Hoy 2013). Consequently, emotion is always excluded from the initial teacher education agenda in many contexts including China. Therefore, scholars have warned that many teachers are ill prepared and insufficiently supported by initial teacher education regarding emotional demands from their career (Darling-Hammond 2001; Hoy 2013).

Teachers face emotional demands constantly from superiors, subordinates, students and parents (Cross and Hong 2012). Thus, teachers are required to be competent in managing their own emotions and emotion of others, which is necessary to ensure the teaching and to cope with the emotional demands (Lee and Yin 2011). This capacity should be a key element in the learning process in their teacher education. It is argued that teacher education should openly deal with teacher emotion and give them

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practice in building the emotional capacity needed in their future career (Hosotani and Imai-Matsumura 2011). However, teacher education gives little attention to their efficacy and effectiveness with taking emotions into account (Pitkäniemi 2017).

Nowadays, a series of continuous reforms is being implemented in the Chinese context. Teachers in China are experiencing a paradigm shift from a teacher-cantered into a more learner-oriented teaching style in which greater teacher academic accountability for teacher effectiveness is expected (Tan and Chua 2015). Teachers, especially beginning teachers, believe that field experiences are the most influential part of their preparation. A pre-service teacher's field experience has been proved to have a great impact on the future teacher performance (Moulding et al. 2014). These highlight the relevance of investigating the role of pre-service teachers' emotion on their efficacy and field experience performance in the Chinese context.

Role of Teacher Emotion

The relevant literature has identified the role of teacher emotion in relation to different aspects of education such as teacher, teaching, student, and learning. Firstly, it is widely recognized that teacher emotion affects their teaching and themselves as teachers. Teacher emotion intertwines with teachers' cognition and motivation that is associated with their instructional behaviours (Uitto et al. 2015). It is identified that teacher emotion has influence on many aspects of teachers' cognitive processes. For example, teacher emotions can influence their attention, memory, thinking, and problem solving (Golombek and Doran 2014). Further, other findings show that teacher emotion is related to factors such as teacher identity (Lee et al. 2013), vulnerability (Kelchtermans 2011), personal and professional lives (Schutz and Zembylas 2009), and well-being (Yin et al. 2017). Indeed, emotions play a significant role for teacher development in the teaching profession (Mansfield et al. 2012). Secondly, research also has identified that teacher emotions affect many aspects of students' classroom life including students' emotions (van Uden et al. 2014), student–teacher relations (Yan et al. 2011), engagement and motivation (Becker et al. 2014). Empirical evidence indicates that teacher enjoyment is positively related to students' enjoyment within classroom settings (Frenzel 2014). It seems that the relationship between teacher and students is a critical 'emotional filter' (Zembylas et al. 2014). However, it is proposed that teachers need appropriate support to develop a good student–teacher relationship in which a variety of emotional efforts are encompassed (Newberry 2010). It is identified that teachers with negative emotions are inclined to reduce

the chances that students will utilize a deeper level of cognitive learning approaches (Linnenbrink-Garcia and Pekrun 2011). Classrooms that demonstrate positive emotions are more likely to produce a better learning environment which supports student learning and development (Yan et al. 2011).

Efficacy, Teacher Emotion, and Effectiveness

Pekrun's (2006) control-value theory (CVT) offers a theoretical framework for the current study. The CVT posits that an individual's cognitive appraisals (e.g. subjective control and subjective value) proximally determine one's achievement emotions and then outcomes. Subjective control refers to an individual's perceived causal influence of the self over achievement activities and outcomes. It can take the forms of retrospective causal attribution and prospective expectancy of success or failure, often operationalized as self-efficacy (Pekrun et al. 2011). Subjective value is not discussed since it is not relevant in this study. Achievement emotions in the CVT are defined as emotions tied directly to achievement activities or outcomes. Teacher emotion in this study is believed as a kind of emotions linking to their teaching activities and outcomes. To date, the CVT is prevalent in studies focusing on students' efficacy, emotion, and outcome (e.g. Luo et al. 2016; Stankov et al. 2012; Villavicencio and Bernardo 2013). However, the CVT is less fully adopted in the studies on teacher emotion.

The relationship between teacher efficacy and emotion can be observed from some studies. Self-efficacy is a psychological disposition involving the self-measurement of one's belief in one's ability to successfully achieve preset goals (Bandura 1997). The concept of teacher efficacy in this study refers to a teacher's own judgments about his or her ability to bring desired outcomes that often relate to students' learning and classroom engagement (Tschannen-Moran and Hoy 2001).

Some studies examine the correlation between teacher efficacy and emotion. In general, teacher efficacy has been positively related to their emotions. Teachers who have high self-efficacy normally experience more positive emotions during teaching (Borrachero et al. 2013). Quintero et al. (2009) argue that teachers' high self-efficacy plays a pivotal role in creating a state of emotional calm focused on getting things done. In contrast, teachers with lower self-efficacy beliefs report more negative emotions (Pitkäniemi 2017). In a Chinese study by Yu et al. (2015), it is found that when teachers with lower self-efficacy tend to experience a great level of pressure in their work. In addition to the positive association, research shows the predictive association between two variables. For instance,

Skaalvik and Skaalvik (2014) identified that teachers' self-efficacy positively predict their satisfaction but negatively predict emotional exhaustion. In contrast, positive emotions that teachers present are a good predictor in building of self-efficacy (Brígido et al. 2013). Teachers who are comfortable and happy with their deeds normally have a strong sense of self-efficacy related to their feelings of competence in handling difficulties in the classroom. It seems that the relationship between teacher efficacy and emotion is still inconclusive. Moreover, the relationships identified in the most aforementioned studies are based on the empirical evidence rather than grounded on the theories. Compared to the association between teacher efficacy and emotion, evidence on the linkage between teacher efficacy and effectiveness is well established and conclusive. Klassen and Tze (2014) conducted a meta-analysis indicating that teachers' self-efficacy is positively and strongly associated with their teaching performance. However, it seems that there are no studies to investigate the relationship between teacher emotion, efficacy, and effectiveness.

Taken together, grounded on the control-value theory, this study will examine the relationship between pre-service teacher efficacy, emotion, and effectiveness using a large sample from four Chinese normal universities. The research question is listed as following:

What are the Relationships Between Teacher Efficacy, Emotion, and Their Practicum Performance?

The three hypotheses are proposed as follows:

H1 Teacher efficacy predicts their practicum performance score through their emotions.

H2 Teachers' high level of efficacy positively predicts their performance through positive emotions.

H3 Teachers' low level of efficacy negatively predicts their performance through negative emotions.

Method

The Research Context

In the traditional teacher training system in China, initial teacher education institutions can be categorized into three types, that is, secondary teacher schools offering a two-year education beyond middle school, normal colleges involving a three-year education beyond high school, and normal universities which provide a four-year education beyond high school (Zhou 2014). In response to the educational initiatives arising during the past two decades, especially to the 'Suggestion on Restructuring the Teacher Education Institutions' announced in 1999, various teacher preparation institutions were merged and the approaches used to prepare pre-service and in-service teachers have gradually become more localized and diversified (He et al. 2011). Consequently, the two-year teacher schools have been eliminated and most normal colleges and universities have been upgraded into four years (Zhou 2014). Moreover, some qualified comprehensive universities are encouraged to implement initial teacher education programs. Currently, normal colleges and universities account for 70% of teacher preparation efforts, while other general comprehensive universities with teacher education programs account for 30% (Shi and Englert 2008). The participants in this study were from four normal universities in two provinces.

Pre-service teachers' field placement varies within China and across countries. Pre-service teachers in China usually are arranged to have only one practicum in the final year ranging from 3 to 6 months in different normal universities. Further, mentoring is provided by a cooperating teacher from the placement school and a supervisor from the university. The support includes observations, feedback and guidance for improvement and evaluation. There were three rationales for selecting pre-service teachers for this study. First, the practicum period in the four normal universities is 4 months. Second, all four universities offer a four-year teacher education program to prepare teachers in various subjects at school levels. Third, none of the four universities offers emotion and teacher emotion-related courses. Fourth, the four participating universities adopt the hundred-mark system to assess their pre-service teachers' practicum. These will counterbalance influential factors and reduce their influence on the results in this study.

Sample

In this study, a convenience sample of 1200 pre-service teachers was sought from four normal universities in two provinces in China. Totally, 963 pre-service teachers returned the questionnaires of which 67% (660) were female and 31% (299) were male. There was not much variation in terms of subject, the percentages of Math and Chinese were more or less equal and accounted for 28% and 27%, respectively, participants in English majors were about middle of the range with 24%, and science major participants ranked the lowest with 21%. The number of participants from each university was roughly equivalent ranging from 246 to 299.

Measures

Teachers' Sense of Efficacy Scale (TSES)

The TSES was a task-specific instrument developed by Tschannen-Moran and Hoy (2001). It is an instrument widely used to quantify the level of teacher self-efficacy across contexts with good reliabilities (> 0.85). The TSES includes 24 questions relating to three different factors, which are Instructional Strategies (IS), Classroom Management (CM), and Student Engagement (SE). The 9-point rating scale ranged from 'nothing' to 'a great deal'. The Chinese version of TSES has been validated in different contexts including the Chinese context (Ruan et al. 2015).

Teacher Emotion Inventory (TEI)

The TEI was developed and validated by the first author in the Chinese context through interview studies and a set of validated studies with a high factor reliability (> 0.80) (Chen 2016, 2017, 2018). The 26-item TEI encompassed five dimensions consisting of two positive (Joy and Love) and three negative emotions (Sadness, Anger, and Fear) (Table 1 in detail). Participants responded as to how frequently they had experienced the listed emotion during their practicum. The 6-point frequency rating scale ranged from 'never' to 'almost always'.

Practicum Performance Score

All participating pre-service teachers' external practicum performance scores were collected along with the questionnaires out of class time after they completed their field experience. As mentioned above, the four participating universities adopted the hundred-mark system to assess their student teachers' practicum, which includes class preparation, class teaching, and other tasks assigned by the school and university mentors. This full mark was classified into five rankings, that is, Outstanding (90–100), Very Good (80–89), Good (70–79), Pass (60–69), and Fail (0–59). Findings illustrated that 170 (18%) pre-service teachers gained Outstanding, 127 (13%) gained Very Good, 278 (29%) gained Good, 384 (40%) gained Pass, and 4 (0.04%) failed.

Data Collection and Analysis

After ethics approval by the first author's university, the research team approached the staff responsible for the pre-service teachers' practicum in the four universities through professional connections. After briefing each staff member as to the project, researchers obtained agreement and permission to recruit volunteer participants within each university. The associated staff were asked to distribute the project materials and the questionnaire to the participants who had just come back from practicum. Participants were asked to return completed questionnaires within four weeks directly to the research team using a drop-box at the university.

Data were firstly analysed to test the original TSES and TEI models using confirmatory factor analysis (CFA) with maximum likelihood estimation and oblique rotation in Mplus (Costello and Osborne 2005). During this procedure, some items were trimmed in the two models if regression loading of the item was lower than 0.40 and covariance and variance values were not statistically significant. Next, structural equation modelling (SEM) was employed to detect the linkage between the TSES and the TEI. In other words, the three hypotheses were tested in this step. In addition to the criteria utilized in the CFA step, all statistically non-significant predictor paths were moved in for the SEM step. Please note that modification indices were used to modify regression paths. According to current practice (Marsh et al. 2004), a multi-criteria approach for acceptable model fit was deployed; models were not rejected if gamma hat and CFI $\geq$ 0.90, root mean square errors of approximation (RMSEA) and standardized root mean residuals (SRMR) $\leq$ 0.08, and χ^2/df ratio was statistically non-significant ($p > 0.01$). Models that met these criteria were not rejected.

Results

The Measurement Model: Teachers' Sense of Efficacy Scale (TSES)

Based on the criteria above, two items were removed from Classroom Management and Student Engagement in the CFA procedure and one item was removed from Instruction Strategies in the SEM procedure from the TSES. The 21-item TSES model exhibited an acceptable to good model fit, that is, gamma hat = 0.96; CFI = 0.95; TLI = 0.94; RMSEA = 0.039; SRMR = 0.032; and χ^2 = 705.16; df = 289; χ^2/df = 2.44, p = 0.12 (Fig. 1 and Table 1). The three factors, Instructional Strategies, Classroom Management, and Student Engagement, comprised seven items. Instructional Strategies focused on instructional strategies regarding assessment, questioning techniques, and individual needs (See more items in Table 1). Classroom Management described teachers' efficacy on keeping routines, dealing with problematic students, and setting expectations. Student Engagement referred to how teachers enhance students' positive values and engage students in learning at school and at home.

Table 1 TSES and TEI and factors, items, and factor loadings

Scale and items	Factor loading
TSES1. Instructional strategies	
1. To what extent can you use a variety of assessment strategies?	0.67
2. To what extent can you provide an alternative explanation or example when students are confused?	0.77
3. To what extent can you craft good questions for your students?	0.84
5. How well can you respond to difficult questions from your students?	0.69
6. How much can you do to adjust your lessons to the proper level for individual students?	0.62
7. To what extent can you gauge student comprehension of what you have taught?	0.59
8. How well can you provide appropriate challenges for very capable students?	0.65
TSES2. Classroom management	
9. How much can you do to control disruptive behaviour in the classroom?	0.80
10. How much can you do to get students to follow classroom rules?	0.81
11. How much can you do to calm a student who is disruptive or noisy?	0.76
13. How well can you keep a few problem students from ruining an entire lesson?	0.61
14. How well can you respond to defiant students?	0.69
15. To what extent can you make your expectation clear about student behaviour?	0.59
16. How well can you establish routines to keep activities running smoothly?	0.64
TSES3. Student engagement	
17. How much can you do to get students to believe they can do well in schoolwork?	0.72
18. How much can you do to help your students value learning?	0.75
19. How much can you do to motivate students who show low interest in schoolwork?	0.80
20. How much can you assist families in helping their children do well in school?	0.79
21. How much can you do to improve the understanding of a student who is failing?	0.74
22. How much can you do to help your students think critically?	0.72
24. How much can you do to get through to the most difficulty students?	0.76
Teacher emotion	
TE1. Joy	
1. I am glad to see my students engage with learning	0.68
3. I enjoy adopting innovative ideas in my teaching	0.74
4. I am glad that students enjoy my teaching	0.66
5. I feel motivated when obtaining support from school leaders	0.86
TE2. Love	
6. I love to witness my students' growth	0.59
7. I love to make contributions to my student learning	0.69
8. I love being a teacher since I can gain a sense of achievement	0.81
9. I am passionate about the nature of teaching	0.56
10. I love being a teacher because it is a profession which can obtain respect and recognition from society	0.64
TE3. Sadness	
11. I feel sad when my students behave badly	0.58
12. I am frustrated if my students don't take ownership for their own learning	0.77
13. I feel frustrated when the activity design does not work as expected	0.69
14. I feel frustrated when my professional beliefs are conflicting with the requirements of education reforms	0.74
15. I feel frustrated by the stiff policies and system	0.68
TE4. Anger	
17. I feel annoyed when my students do not get along well with me	0.79
18. I feel angry when I am treated unfairly (i.e. workload, salary, and appraisal)	0.77
19. I feel angry if my profession has been abused	0.76
20. I am indignant when the society and/or public blame teachers without any evidence	0.75

Table 1

TE5. Fear	
21. I am worried to see that my students are pressurized for assessments	0.71
23. I feel pressurized from heavy workload (e.g. preparation work)	0.59
25. I feel pressurized from the unhealthy competition among colleagues	0.49
26. I feel pressurized from irrational parents	0.58

Fig. 1 The model shows paths from Teachers' Sense of Efficacy Scale to Teacher Emotion Inventory and practicum performance score. *Note* Inter-correlations of teacher emotion factors and error terms removed for simplicity
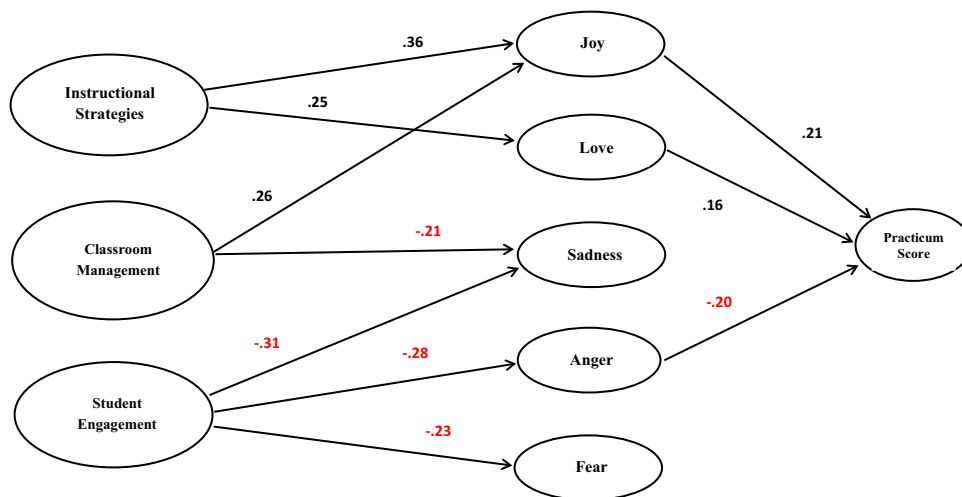
Descriptive statistics revealed that the participants ranked Instructional Strategies as the top ($M = 8.10$, $SD = 0.82$), followed by Classroom Management ($M = 7.79$, $SD = 0.80$) and Student Engagement ($M = 7.00$, $SD = 0.86$). The effect sizes of mean differences for the three scales ranged from small ($d = 0.38$) to strong ($d = 1.31$) with an average value of 0.88. The scale inter-correlations are moderate ranging from 0.52 to 0.63 with an average value of 0.59. Item reliability for each factor ranged from 0.79 to 0.86 and factor reliability was 0.82 (Tables 2, 3).

The Measurement Model: Teacher Emotion Inventory (TEI)

As with the TSES, two items for Love and Fear were removed in the CFA step mentioned and two more items for Sadness and Fear were removed in the SEM step from the TEI. The 22-item TEI model with five scales demonstrated an acceptable to good model fit, that is, gamma hat = 0.96; CFI = 0.93; TLI = 0.94; RMSEA = 0.038; SRMR = 0.041; and $\chi^2 = 820.52$; $df = 292$; $\chi^2/df = 2.81$; $p = 0.09$ (see Fig. 1 and Table 1). These five factors comprised two positive factors (Joy and Love) and three negative factors (Sadness, Anger, and Fear). Joy involved

of four items which reflected teachers' joy on interacting with superiors, peers and students (See more items in Table 1). Love consisted of five items that were related to teachers' happiness with the teaching profession, such as gaining respect from others and society, or witnessing students' growth. Sadness (likewise five items) described teachers feeling unhappy because of students' unpleasant behaviours and attitudes towards learning and conflicting with policies and requirements. Anger (likewise four items) indicated that teachers were annoyed about unfair treatment and abuse. Fear included four items which were concerned with student achievement, unhealthy competition, and irrational parents.

Descriptive statistics revealed that Love was ranked as the most frequent factor ($M = 5.21$, $SD = 0.72$), whilst Joy was rated as the second most frequent emotion ($M = 5.16$, $SD = 0.75$) followed by the other three negative emotions Fear ($M = 5.15$, $SD = 0.72$), Anger ($M = 5.08$, $SD = 0.74$), and Sadness ($M = 4.19$, $SD = 1.00$). The effect sizes of mean differences for all five scales fluctuated from small ($d = 0.03$) to strong ($d = 1.17$) with the average value of 0.49 (Cohen, 1992). The absolute value of scale inter-correlations varied from small ($r = 0.03$) to large ($r = 0.63$) with the average value of |0.37|. Item reliability for each factor ranged from 0.73 to 0.87 and factor

Table 2 TSES and TEI factor means, SDs, and Cronbach α

Scale	M	SD	Cronbach α	Cohen's d effect sizes[a]				
Teacher sense of efficacy			0.82	TSES1	TSES2	TSES3		
TSE1. Instructional Strategies	8.10	0.82	0.79	–	0.38	1.31		
TSE2. Classroom Management	7.79	0.80	0.86		–	0.95		
TSE3. Student Engagement	7.00	0.86	0.79			–		
Teacher emotion			0.78	TE1	TE2	TE3	TE4	TE5
TE1. Joy	5.16	0.75	0.74	–	0.07	0.11	1.09	0.03
TE2. Love	5.21	0.72	0.73		–	0.18	1.17	0.08
TE3. Sadness	5.08	0.74	0.73			–	1.01	0.10
TE4. Anger	4.19	1.00	0.87				–	1.10
TE5. Fear	5.15	0.72	0.79					–

[a]Effect sizes shown as absolute values

Table 3 TSES and TEI inter-correlations and correlations

Scale	Teacher efficacy			Teacher emotion					Practi-cum
Teacher efficacy	TSES1	TSES2	TSES3	TE1	TE2	TE3	TE4	TE5	
TSES1. Instructional strategies	–	0.63	0.52	0.51	0.49	0.09	0.15	0.08	0.61
TSES2. Classroom management		–	0.62	0.56	0.40	0.11	0.04	.01	0.46
TSES3. Student engagement			–	0.21	0.19	− 0.39	− 0.36	− 0.30	0.25
Teacher emotion									
TE1. Joy				–	0.54	0.09	− 0.43	− 0.46	0.56
TE2. Love					–	0.03	0.10	− 0.32	0.42
TE3. Sadness						–	0.34	0.41	− 0.31
TE4. Anger							–	0.58	− 0.52
TE5. Fear								–	− 0.28

Note. Values < |.06| are not statistically significant

reliability was 0.75, illustrating that the items and factors achieve robust reliabilities in each scale, which could be meaningfully used for further analysis (Table 2 and Table 3).

The Structural Model

In accordance with the three hypotheses and guided by the CVT and mean score of each factor in the TSES, all possible paths from each teacher efficacy factor to either positive or negative emotions and practicum performance score were tested using standardized estimates. After removing statistically non-significant paths, due to the inter-correlated nature of the TSES and TEI measurement models, an acceptable to good fit was found: gamma hat = 0.89; CFI = 0.90; TLI = 0.90; RMSEA = 0.048; SRMR = 0.051; and χ^2 = 3065.59; df = 899; χ^2/df = 3.41, p = 0.06 (Fig. 1).

This SEM model portrays that pre-service teacher efficacy affect their practicum performance score through their emotions (H_1). The model represents two types of relationships. The first one describes the relationship from teacher efficacy to emotion. The second one designates the relationship of teacher emotion to their practicum performance. Further, guided by H_2 and H_3, the data show that teachers with a higher level of efficacy tend to have positive emotions and teachers with a lower level of efficacy are more likely to experience negative emotions although there is one interesting link between Classroom Management and Sadness. Logically, positive emotions correlate with the higher level of efficacy scales. By contrast, negative emotions are significantly but reversely correlated with the lower level of efficacy scales. Further, the three emotion factors (e.g. Joy, Love, Anger) showed a relatively strong correlation with practicum scores. This could be also observed from the factor correlations in Table 3.

The structural model identified seven regression paths leading from the TSES scales to the TEI scales and three paths from the TSES scales to the practicum performance score. All paths (β) were ranging from |0.18| to |0.36| with

an average value of 0.25. The model reveals three statistically significant paths linking to performance scores: Joy ($\beta = 0.21$), Love ($\beta = 0.18$), and Anger ($\beta = -0.20$).

Taking these together, positive emotions (e.g. Joy and Love) of pre-service teachers positively predict their practicum performance affected by teacher efficacy on Instructional Strategies and Classroom Management. Whilst Anger negatively predicts practicum performance affected by teacher efficacy on Instructional Strategies ($\beta = -0.20$). Moreover, the two undesirable emotions (Sadness, Fear) do not show the link to practicum performance. Therefore, the three hypotheses have been confirmed although there are a couple of exceptions. In other words, the significant relationships from teacher efficacy to their emotions which affect their practicum performance have been confirmed in this structural model.

Discussion

Based on the theoretical and conceptual framework, the hypotheses have been proposed to identify the relationship between teacher efficacy, emotion and their practicum performance. Drawing conclusions from a rather large sample of Chinese pre-service teachers, this study not only identified the hypothesized links between the three constructs, but also provided more solid empirical connections at dimensional levels among the three constructs. The section has been organized to discuss the major findings of the TSES and TEI models followed by a discussion of the interesting relationships among the three contracts at the dimensional level in the SEM model.

As expected, the Chinese participating teachers in this study confirmed the TSES and TEI models in a similar manner to previous studies (e.g. Moulding et al. 2014; McLennan et al. 2017). These pre-service teachers were tested with the same scales although a couple of items had been dropped in the two models. This result may be because the TSES is a widely adopted instrument with a good reliability across different cultural contexts including Chinese contexts and the TEI was developed and validated in the Chinese context by teachers (Klassen et al. 2009; Ruan et al. 2015). As for the TSES model, the participants in this study are most confident of their efficacy on Instructional Strategies and Classroom Management but least confident of engaging students. This is consistent with other studies in which the first two scales always gained higher mean scores but Student Engagement always ranked at the bottom (e.g. Chao et al. 2017 in Hong Kong; Klassen et al. 2009 in Canada, Cyprus, Korea, Singapore, and the United States). This consistency may indicate that teachers across different contexts are confident of managing classroom and utilizing pedagogies but feel challenges on

engaging students into learning. However, it might be interpreted that classrooms in China are typically characterized by large class sizes, expository methods, and drilling for externally mandated, high-stakes examinations (Watkins and Biggs 2001). Therefore, teachers feel it difficult to engage students. The TEI model indicates that teachers in this study gave a higher ranking to positive emotions and a lower ranking to negative emotions. This is a good indicator meaning these teachers experienced positive emotions more frequently than negative emotions. This finding is discrepant with a previous study, which found that Love is the least experienced emotion and the three negative emotions were in the middle (Chen 2016). It is notable that Anger, as the least experienced emotion, not only had the lowest mean score but also a large mean difference from the other four emotion factors (d ranging from |1.01| to |1.17|). This indicates that the items on the Anger scale need to be paid especially attention to.

Looking at the structural model, it generally shows that pre-service teachers' efficacy significantly predicts their practicum performance through their emotions. More specifically, teachers with a higher level of efficacy on Instructional Strategies positively predict their practicum performance through more pleasant emotions such as Love and Joy. The items in the two models indicate that the participants in this study expressed that a higher level of confidence about providing a variety of teaching and assessment pedagogies to meet the needs of different students leads to their enjoyment of the learning and teaching process and witness students' growth (Brígido et al. 2013). These then positively predict their practicum performance. By contrast, the data also reveal that pre-service teachers with a lower level of confidence of Student Engagement tend to experience more unpleasant emotions (e.g. Fear, Sadness, and Anger) and gain lower practicum performance. This result is consistent with the finding from the literature which showed that teachers with a lower level of efficacy are more likely to experience a negative emotional state (e.g. depression, anxiety, and stress) (García et al. 2006; Warren and Dowden, 2012). This result is also congruent with a Chinese study indicating when teachers with lower self-efficacy tend to experience a great level of pressure in their work (Yu et al. 2015, p. 705).

The connection identified may reflect a universal condition regarding teacher efficacy since the level of efficacy in engaging students is always low across different contexts (Chao et al. 2017; Klassen et al. 2009). Furthermore, the interpretation of the connection could be embedded in the China context for several reasons. First, Chinese parents always have high expectation of their child's education. In view of the implemented one-child policy in China, parents are willing to sacrifice and do everything possible to help their only child get a good education and have a bright

future. This may result in students not being willing to take ownership of their own learning but expecting their parents or even teachers do it. This causes teachers' negative emotions (e.g. pressure and frustration) in engaging students in learning. Second, China has a long history of using assessments to select and reward talent. Performance on high-stakes assessments has always been a legitimate, meritocratic basis for upward social mobility for Chinese students regardless of social background (Kennedy 2016). In this circumstance, teachers worry about assessment performance and do more in-class exam-taking practice more often which may reduce their confidence in engaging students and therefore affect their performance. Hence, although these participants rated the lowest confidence in Student Engagement, they still perceived that engaging students is critical to their effectiveness (van de Grift et al. 2017).

Interestingly, these participants showed that their mixed emotions (Joy and Sadness) are predicted by a relatively higher level of efficacy in classroom management, but only one link (Joy) transfers to their practicum performance. Brígido et al. (2013) found that teachers with high self-efficacy feel comfortable and enjoy their tasks because they feel capable of dealing with things through displaying confidence and security in the classroom. Enhancing teachers' positive emotions might help them successfully perform classroom management tasks and manage misbehaviours so as to create classrooms in which student and teacher effectiveness have been reinforced (Kunter et al. 2013; Lazarides et al. 2017). This study only show that teachers' joy predicts their performance which aligns with the aforementioned studies. The missing link from Sadness to performance is interesting.

Speculatively, this may be caused by the other link between Sadness and Classroom Management. It shows that Sadness with the second lowest mean score among emotion factors is not expected to have a relationship with Classroom Management which ranked second among the efficacy factors and had a large mean difference with the third ranking of Student Engagement. Although the two β values between Classroom Management and Sadness (-0.21) and Joy (0.26) are not high but still significant. The negative link between Sadness and Classroom Management might be caused by Chinese students' unwillingness to take ownership of their learning. Therefore, Chinese teachers share the mixed emotions (Joy and Sadness) with classroom management. Teachers may feel sad since it is difficult to complete prepared tasks when dealing with these kinds of students in a large class size classroom although they thought that classroom management is critical for their performance. However, as the class size issue and students willingness are hard to change, perhaps pre-service teachers in this study are aware of the problems but

also feel powerless to change the situation. It is suggested that negative attitudes are often more related to practical concerns than ideological opposition (Burke and Sutherland, 2004; Malinen et al. 2012). This study provides support for this general notion and adds to the existing knowledge by showing how teachers' efficacy level of Classroom Management are affected by mixed emotion (Joy and Sadness) in the Chinese context.

Implications

Given the prevalence of increasing teacher academic accountability and negative symptoms among teachers worldwide, the findings of this study seem timely. The present study may have important implications for relevant theories, teacher preparation and selection, and teaching improvement. This study confirmed the hypothesis that teacher emotions are predicted by teacher efficacy, which affect teacher effectiveness in the eyes of pre-service teachers. This research not only speaks to the need for a theoretical model of the emotion capacity as a must for all teachers, but also demonstrates how to utilize these capacities to enhance teaching improvement through their efficacy. It frames, refines, and extends prior theoretical models on teacher effectiveness. This study also informs that the CVT can be adopted in teacher studies. Furthermore, the findings of this study are also informative for teacher preparation and the selection process in teacher education. Teacher preparation programs and courses in initial teacher education and professional development might consider including instruction in emotional strategies and skills that can enhance teacher's emotion capacities in daily communications with key stakeholders through involving with teacher efficacy.

Limitations and Future Studies

This study has a couple of limitations. First, this study only utilized self-report data which could produce a bias since self-report data may or may not reflect pre-service teachers' actual perceptions of their emotion and efficacy. Future studies may consider 360 degree assessment surveys from different stakeholders such as subordinates, peers, themselves, and/or superiors. Second, the factor-based instruments of teacher emotion and efficacy used in this study may or may not fully reflect the complexity of the two constructs. Future investigations may consider involving teacher interviews or observations to better capture the nature of the two constructs. Third, this study was a cross-sectional study, thus correlational or reciprocal relations cannot be inferred. Longitudinal or experimental studies

are needed to dig deeper into the more dynamic relationships between teacher emotion, efficacy, and their effectiveness.

To sum, the findings of this study are encouraging, despite being a modest first step in investigating the relationships between teacher efficacy, emotion, and effectiveness. However, 'teachers are made, not born' and both emotion and efficacy remain intriguing yet elusive concepts (LeDoux 1995 for emotion; Tschannen-Moran and Hoy 2001 for efficacy); therefore, a cautious conclusion is to empower these concepts at the initial stages of the teaching profession. Because when teachers become established, they become more resistant to change over time (Malinen et al. 2012).

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