

## Article

# More Knowledge, More Satisfaction with Online Teaching? Examining the Mediation of Teacher Efficacy and Moderation of Engagement during COVID-19

Shenghua Huang <sup>1</sup>, Hongbiao Yin <sup>2</sup> , Yule Jin <sup>1</sup> and Wenlan Wang <sup>3,\*</sup>

<sup>1</sup> Faculty of Education, Shenzhen University, Shenzhen 518060, China; s.huang@szu.edu.cn (S.H.); jinyule@szu.edu.cn (Y.J.)

<sup>2</sup> Faculty of Education, Chinese University of Hong Kong, Hong Kong SAR, China; yinhb@cuhk.edu.hk

<sup>3</sup> School of Educational Science, South China Normal University, Guangzhou 510631, China

\* Correspondence: wang\_wenlanhb@m.scnu.edu.cn

**Abstract:** During the COVID-19 pandemic, university teachers need to spend time and energy getting used to the online teaching system and adapting their teaching materials to the new teaching mode. According to the social cognitive theory, teachers' technological pedagogical content knowledge (TPACK) and their work engagement, both of which can be important sources of efficacy beliefs, can be critical in conducting teachers' self-efficacy for online teaching and in turn their well-being. Based on the data collected from 2763 university teachers during the COVID-19 pandemic in China, this study explored how TPACK and work engagement contribute to teachers' self-efficacy for online teaching, if there is any interaction between TPACK and work engagement, and how self-efficacy mediates the relationships between TPACK and teachers' online-teaching-related emotional exhaustion, teaching satisfaction, and their intention to use online teaching in the future. The implications for theory and practice are discussed.

**Keywords:** technological pedagogical content knowledge; self-efficacy; work engagement; well-being; university teachers



**Citation:** Huang, S.; Yin, H.; Jin, Y.; Wang, W. More Knowledge, More Satisfaction with Online Teaching? Examining the Mediation of Teacher Efficacy and Moderation of Engagement during COVID-19. *Sustainability* **2022**, *14*, 4405. <https://doi.org/10.3390/su14084405>

Academic Editor: Jesús-Nicasio García-Sánchez

Received: 16 March 2022

Accepted: 6 April 2022

Published: 7 April 2022

**Publisher's Note:** MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



**Copyright:** © 2022 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

## 1. Introduction

During the COVID-19 pandemic, physical distancing and quarantine are important measures to control the rapid spread of the virus [1,2]. As a result, schools and universities are closed, and a shift away from traditional classroom teaching towards online or virtual learning has been observed all over the world [2]. This shift brings many new challenges to teachers and students in higher education institutions across countries. On the one hand, the new teaching mode requires both teachers and students to adapt to the online teaching system, and teachers in particular have to adapt their teaching materials to the online teaching mode. On the other hand, the lack of real-time, face-to-face classroom interactions may make teachers feel less engaged both physically and emotionally. Moreover, like other parents, teachers who have to take care of their school-age children when working from home may find it extremely stressful to balance the work and family roles, and they may thus show less vigor and enthusiasm in their teaching [3].

Both of the abovementioned scenarios may have salient impacts on university teachers' self-efficacy for online teaching and their work-related well-being [4–6]. Comparatively, the challenges regarding the new online teaching mode seem to be less difficult to overcome. In China, for example, most university teachers have adopted multimedia in their classroom instruction for years, and most are quite capable and can surely adapt themselves to the online teaching software and platforms. However, some may find it difficult to adapt their teaching materials and teaching styles to facilitate their online teaching. Despite researchers

having embraced the theoretical framework of Technological Pedagogical Content Knowledge (TPACK), which assured that effective technology integration in teaching requires “a nuanced understanding of the complex relationships between technology, content, and pedagogy” [7,8], its importance is mainly recognized in primary or secondary school education. Little attention has been paid to higher education [9]. The lack of TPACK and the failure to recognize and take full advantage of the connections among technological, pedagogical, and content knowledge may contribute to university teachers’ struggles during online teaching, leading to a sense of incapability.

The challenges regarding teacher engagement, however, seem to be more complicated. Real-time classroom interactions are central to the teaching and learning processes. While the vigor, dedication, and enthusiasm shown by teachers contribute to students’ participation in the classroom, students’ real-time responses are also important for teachers. Students’ facial expressions, verbal responses, and even body language all give teachers clues about whether they are interested in the particular topic or how well they understand the course content. Students’ attentiveness, active participation, and proper feedback would also influence teachers’ moods and teaching enthusiasm. Therefore, the lack of face-to-face interaction during online teaching prevents teachers from getting useful clues and feedback, and thus may let teachers feel less engagement both physically and emotionally. Extra family responsibilities faced by teachers due to social distancing and quarantine may also make it more difficult for them to commit themselves to online teaching, and reduce their sense of efficacy [3].

Therefore, in this study, we attempted to test whether and how teachers’ TPACK and engagement during the COVID-19 pandemic are associated with their perceived efficacy, and in turn their online-teaching-related well-being and intention to use online teaching in the future. In educational settings, teachers’ self-efficacy is usually defined as a state-like characteristic, and may change across situations and develop over time [5,6]. For example, teachers’ sense of efficacy for inclusive education can be quite different from their efficacy for traditional education. Teachers’ sense of efficacy can also vary across different subjects, learning topics, and teaching tasks. Therefore, university teachers’ efficacy for online teaching during the COVID-19 pandemic can be quite different from their efficacy for traditional teaching on normal days. According to the social cognitive theory, mastery experience, physiological and emotional states, vicarious experience, and social persuasion are four major sources of efficacy beliefs [4]. Therefore, in the context of online teaching, teachers’ TPACK, which is drawn from their previous mastery or vicarious experience and contributes to their future mastery experience, can be critical in conducting teachers’ self-efficacy for online teaching, and in turn their well-being. Likewise, work engagement in the current study is defined as the “persistent, positive affective-motivational state of fulfillment in employees that is characterized by vigor, dedication, and absorption” [10]. Teachers’ work engagement or their flow experience reflects the level of arousal of their physiological and emotional states, which adds to the feeling of mastery or incompetence [5,11]. Therefore, teachers’ TPACK and work engagement also represent two sources of teacher efficacy: mastery experience and affective states.

In short, an investigation on the relationships between university teachers’ TPACK, work engagement, and teacher efficacy as well as their roles in influencing teachers’ online-teaching-related well-being and future intention can provide a better understanding of university teachers’ professional lives during the pandemic. It can also contribute to a discussion about the gains and pitfalls in the adaptation of online learning in higher education and to what extent online teaching can be integrated into traditional higher education teaching modes even after the pandemic.

To address the existing research gaps, the present study collected data from 2763 university teachers during the COVID-19 pandemic in China and explored how TPACK contributes to teachers’ self-efficacy for online teaching and how self-efficacy mediates the relationships between TPACK and teachers’ online-teaching-related emotional exhaustion, teaching satisfaction, and their intention to use online teaching in the future. The moderation role of

teacher engagement is also examined. Three research questions guided this study: (1) How do TPACK and work engagement contribute to university teacher efficacy, well-being (i.e., emotional exhaustion and teaching satisfaction), and intention to use online teaching in the future? (2) Is there any interaction effect existing between TPACK and work engagement? and (3) Does teacher self-efficacy mediate the relationships between TPACK and teachers' well-being and future intention?

## 2. Literature Review

### 2.1. Teacher Self-Efficacy

Self-efficacy is generally defined as individuals' beliefs about their skills and capacities to fulfill certain tasks, and determines individuals' resistance to obstacles, persistence when faced with setbacks, and determination to fulfill difficult tasks [4,12]. In educational settings, teacher self-efficacy refers to teachers' beliefs about their teaching-related capabilities and the extent to which they can affect their students' motivation and performance [5,6]. It is positively related to teachers' positive attitudes about teaching, persistence in the face of setbacks or failures, teaching effectiveness, and professional competence as well as student classroom participation and academic achievement [13–15].

Bandura's social cognitive theory suggested that teacher efficacy is a state-like variable, and may develop over time and vary across, for example, different teachings tasks, learning topics, and subjects [4]. There are four principal sources of information on which teachers can build their efficacy via cognitive processing, including mastery experience, physiological and emotional states, vicarious experience, and verbal persuasion. Among these four sources, mastery experiences (i.e., one's own successful experience) and the accompanying physiological and emotional states (i.e., level of arousal) represent individuals' first-hand experience of success, while vicarious experience (i.e., others as successful role models) and verbal persuasion (i.e., others' assurance about the potential of success) reflect individuals' second-hand information about the potential success that they obtained either through daily observation or personal communication [5,16]. It is reasonable to infer that individuals' direct, first-hand experience is more critical to the development of efficacy beliefs than their indirect, second-hand experience. Therefore, in the current study, we focused on the roles of teachers' TPACK and engagement. Teachers' TPACK represents the synthesized skills possessed by the teachers which can be used to facilitate their ICT integrated teaching, and thus directly contributes to teachers' mastery experiences, while teachers' engagement characterized by the activated pleasant affect and energetic feelings can in some way enhance the feelings of success or mastery.

Defined as a state-like variable, teacher self-efficacy is context-specific, task-dependent, and goal-oriented [5,17,18]. During the COVID-19 pandemic, the contexts, tasks, and goals of university teachers have more or less changed. The online teaching system and extra family burden have redefined the contexts of teaching. Teachers' self-efficacy for online teaching can be quite different from that for traditional classroom teaching. Teachers may find it more difficult to engage their students when they cannot really see what their students are doing behind the computer screen. The goals of teaching may not be merely to teach the required courses but also to cheer each other up and to reduce the potential harm caused by social distancing and quarantine. Therefore, it is important to look at university teachers' self-efficacy during the COVID-19 pandemic and to investigate factors that may impact their self-efficacy, and how their self-efficacy may influence their well-being and intention to use online teaching in the future.

### 2.2. TPACK

Teacher knowledge is multifaceted. Typically, a teacher not only needs to know the subject matter to be taught (i.e., content knowledge, CK) but also has to understand the learning and teaching process, to see students' learning difficulties, and to adopt proper pedagogical approaches (i.e., pedagogical knowledge, PK). Shulman proposed the concept of pedagogical content knowledge (PCK), suggesting that the two fundamental forms of

teacher knowledge (i.e., CK and PK) are not mutually exclusive, and the overlapping area of the two is PCK, a unique form of teachers' knowledge that integrates specific domain knowledge with appropriate teaching approaches [19,20].

With the rapid development of Information and Communication Technology (ICT) and the integration of ICT in educational settings, technological knowledge (TK), or teachers' understanding of technologies and relevant operating skills, has emerged as the third fundamental form of teacher knowledge. Therefore, built on Shulman's notion of PCK [19,20], the theoretical framework of TPACK has been developed to illustrate the three fundamental forms of teacher knowledge (i.e., CK, PK, and TK) and the overlapping areas of two or three of them [7,21]. Under the TPACK framework, a total of seven types of teacher knowledge are defined: the three fundamental forms of teacher knowledge, the overlapping areas of each two types of fundamental knowledge (i.e., PCK, technological pedagogical knowledge (TPK), and technological content knowledge (TCK)), and the overlapping area of the three (i.e., TPACK). Obviously, the triple integration of fundamental forms of knowledge is at the core of the TPACK framework. It represents knowledge regarding how to adopt technologies to enhance the teaching and learning process for specific teaching content, and could be seen as the "contextualized and situated synthesis of teacher knowledge that manifests itself in ICT-integrated lessons" [7].

TPACK gives information about whether and how teachers can integrate ICT into classroom teaching and allow teachers to design suitable teaching and learning activities for their students. While the importance of TPACK is widely recognized, little attention has been paid to the TPACK possessed by university teachers. This lack of due attention seems to be more striking when online or virtual learning has become and will be the new reality faced by teachers and students for some time to come.

### 2.3. Work Engagement

Work engagement is defined as "a sense of energetic and effective connection with their work activities" and the extent to which individuals "see themselves as able to deal well with the demands of their jobs" [22]. From the perspective of positive psychology, work engagement measures the strength and optimal functioning of followers [22,23]. Work engagement includes three pervasive, affective-cognitive states, namely, vigor, dedication, and absorption [22,24]. Vigor reflects the extent to which followers are energetic, persistent, and resilient during work; dedication reveals how followers devote themselves to their work and find passion and enthusiasm in it; and absorption denotes a flow state in which followers fully concentrate on and immerse themselves in their work with great pleasure [24,25].

The concept of state engagement is similar to the "flow" experience. A flow state is a mental state in which a person is fully immersed in the process of the ongoing activity with a feeling of energized focus, full involvement, and enjoyment. The experience of flow requires the balance between challenges and abilities, and between requirements and resources [26]. Accordingly, followers are more likely to show vigor, dedication, and absorption when the organizational environment can provide the followers with abundant resources even in the face of setbacks and failure (needs-supplies fit), when job requirements and task difficulties match with the ability and skills of the followers (demands-abilities fit), and when the nature and characteristics of the job match with the interest and preference of the employee (person-job fit) [25,27,28].

Faced with new challenges and extra role requirements during the COVID-19 pandemic, university teachers' work engagement may display some different features. It will be fruitful to investigate teachers' work engagement during the pandemic and its potential roles in influencing teachers' efficacy, well-being, and intention to use online teaching in the future.

In sum, TPACK represents the knowledge required for mastery experience, and work engagement reflects the physiological and emotional states during online teaching. Tschannen-Moran et al., suggested that the level of arousal adds to the feeling of mastery or

incompetence [5], while the flow theory states that the match between one's abilities and the requirements is an important prerequisite for flow experience or work engagement. In other words, mastery experience and physiological and emotional states are not only conducive to efficacy expectation but may enhance each other. Therefore, we are also interested in the interactional effect of TPACK and work engagement on teacher self-efficacy.

#### 2.4. Well-Being and Future Online-Teaching Intention

Teachers' well-being during the COVID-19 pandemic and their future online-teaching intentions are implicated by teachers' online-teaching-related emotional exhaustion, teaching satisfaction, and their intentions to use online teaching in the future.

Emotional exhaustion is a pivotal element of burnout that depicts the feelings of fatigue induced by persistent depletion of emotional resources [29]. It is common for individuals who use their emotional resources during interpersonal interactions, especially when they are interacting with people who they believe to occupy a higher power position than themselves. The long-term, frequent use of emotional resources and the limited sources of replenishment will cause emotional exhaustion [30], which in turn leads to resource conservation and disengagement [29].

Teaching satisfaction denotes teachers' subjective evaluation of their job and its related aspects [31]. High teaching satisfaction reflects teachers' sense of fulfilment and feeling of gratification towards their teaching job [30]. Different from emotional exhaustion which is individuals' immediate response towards certain workplace stressors or a lack of supports, teaching satisfaction is a comprehensive construct that describes teachers' overall feelings toward teaching after entirely evaluating the salaries, work environment, long-term career opportunities, and personal values [32,33]. Therefore, teachers may experience emotional exhaustion everyday but still feel satisfied with their teaching job.

Teachers' intentions to use online teaching in the future represent their future behavioral tendency. There are various theories that tackle the factors influencing individuals' decision-making processes and behaviors. For example, the expectancy-value theory proposes two important predictors of individuals' motivated behaviors, namely, individuals' perceived value of a specific action and its outcome (i.e., subjective task value) and individuals' perceptions of their own abilities or control over the process or its results (i.e., expectation of success) [34]. In a similar manner, the theory of planned behavior emphasizes that individuals' attitudes towards a specific behavior and its outcome (i.e., value in the eyes of the self), subjective norms (i.e., value in the eyes of significant others), and their perceived behavioral control (i.e., expectation for success) are predictive of their behavioral intentions and actual behaviors [35,36]. Both theories suggested that individuals' perceived control or beliefs in their own abilities have important implications for their behavioral intentions.

Comparing these three outcome variables, emotional exhaustion is a more direct, emotional reaction to job-related stress, teaching satisfaction reflects individuals' cognitive evaluation of various aspects of their job, while intention to use online learning in the future represents teachers' future behavioral intentions based on these emotional states and cognitive evaluations.

#### 2.5. The Present Study

In order to provide a better understanding of university teachers' professional lives during the COVID-19 pandemic, the present study aimed to investigate relationships between university teachers' TPACK, work engagement, and teacher efficacy as well as their roles in influencing teachers' online-teaching-related well-being and behavioral intentions.

Echoing the three research questions, the following hypotheses were established:

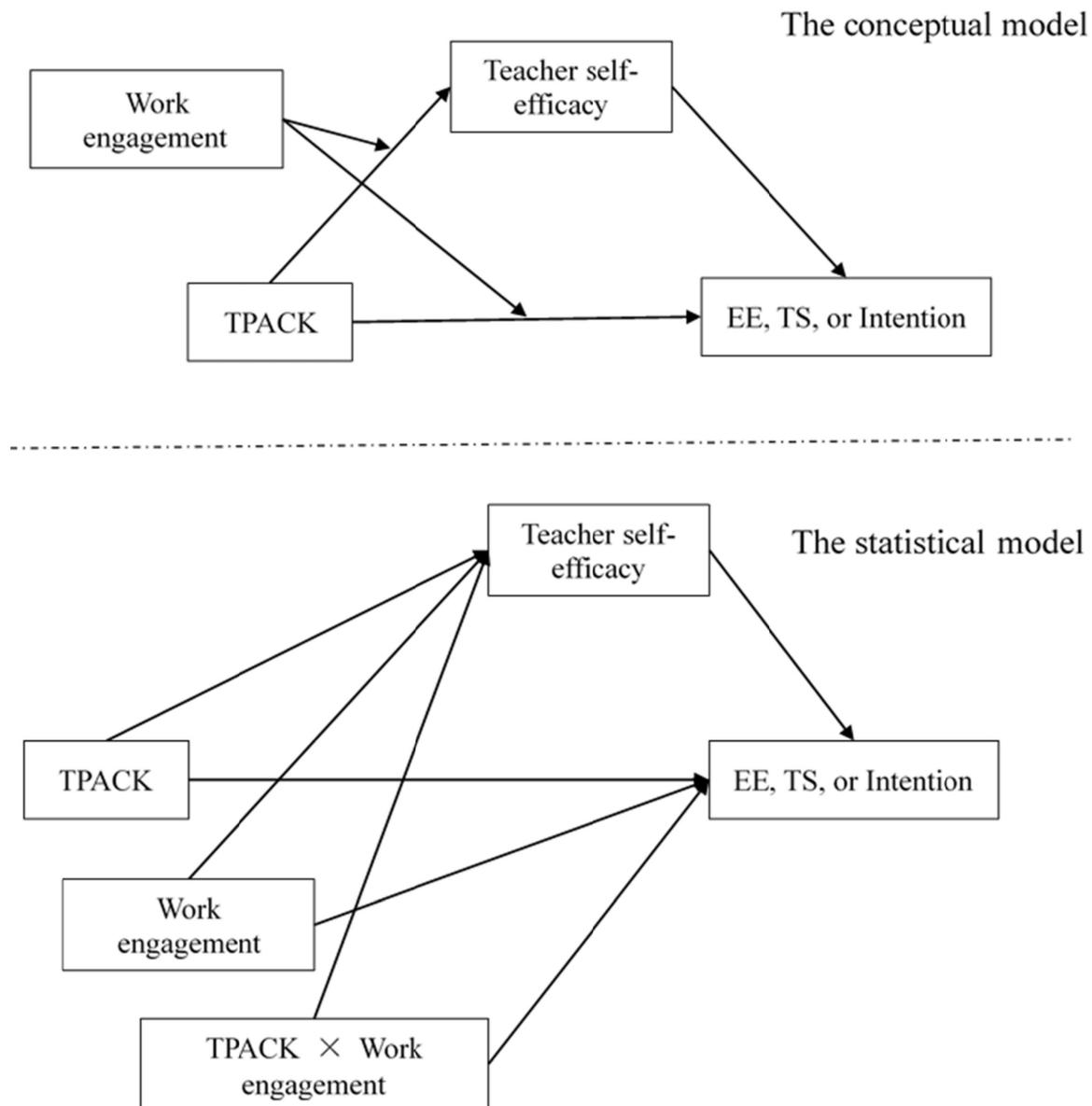
**H1:** TPACK is significantly related to teacher efficacy (positively, H1a), emotional exhaustion (negatively, H1b), teaching satisfaction (positively, H1c), and future use intention (positively, H1d).

**H2:** Work engagement is significantly related to teacher efficacy (positively, H2a), emotional exhaustion (negatively, H2b), teaching satisfaction (positively, H2c), and future use intention (positively, H2d).

**H3:** TPACK and work engagement interact with each other in the relationships hypothesized in H1a–H1d and H2a–H2d (H3a–H3d).

**H4:** Teacher efficacy mediated the relationships between TPACK and emotional exhaustion (H4b), teaching satisfaction (H4c), and future use intention (H4d).

Figure 1 shows the conceptual and statistical framework of the present study.



**Figure 1.** The Conceptual and Statistical Model of the Present Study. TPACK = Technological pedagogical content knowledge; EE = Emotional exhaustion; TS = Teaching satisfaction; Intention = Intention to use online teaching in future.

### 3. Materials and Methods

#### 3.1. Participants

Consistent with research ethics review procedures, this study was carried out in accordance with the recommendations of the Survey and Behavioral Research Ethics Committee at the institute where the second author works.

The data collection was conducted in April 2020 when the COVID-19 pandemic was prevalent in the Chinese mainland. All Chinese higher education institutions had suspended face-to-face teaching and adopted the online teaching mode, following the requirement of the Ministry of Education. Through the platform of wenjuanxing (Questionnaire Star, Changsha, China), we invited university teachers across China to complete this questionnaire survey on a voluntary basis.

The final valid sample of the current study included 2763 university teachers from more than 300 universities and colleges in China. The participants taught in various disciplines. Out of the 2763 teachers, 1047 (37.9%) were male teachers, and 1716 (62.1%) were female teachers. In terms of their teaching experience, 923 (33.4%) teachers reported having less than 10 years of experience, 1506 (54.5%) had 10 to 30 years, and 334 (12.1%) had more than 30 years of experience. The majority of participating teachers reported having a master's (1330, 48.1%) or doctoral degree (1238, 44.8%), and only 195 (7.1%) teachers reported having a bachelor's degree.

#### 3.2. Measures

##### 3.2.1. TPACK

TPACK of teachers was measured by a 6-item scale adapted from Chai et al. [7]. Items were slightly modified to suit the daily teaching context in higher education. A sample item is "I can design student-centered learning that integrates knowledge of teaching content, technologies and pedagogies in university teaching." The Cronbach's  $\alpha$  coefficient of the TPACK scale in this study was 0.91.

##### 3.2.2. Work Engagement

Teachers' work engagement was measured by the Utrecht Work Engagement Scale Shortened version (UWES-9) [22]. The UWES-9 scale has three three-item subscales. Sample items include "During online teaching, I feel bursting with energy" (vigor), "I am enthusiastic about my online teaching" (dedication), and "I am immersed in my online teaching work" (absorption). The Cronbach's  $\alpha$  coefficient of the full scale and the three factors mentioned above were 0.96, 0.86, 0.94, and 0.92, respectively. In the current study, we used the composite factor of work engagement due to the extremely high correlations among the three factors (i.e., higher than 0.75).

##### 3.2.3. Teacher Efficacy

Teacher self-efficacy for online teaching was measured by Yin et al.'s five-item personal teaching efficacy scale (PTE) [37]. A sample item is "If I really try hard, I can get through to even the most difficult or unmotivated students via online teaching." The Cronbach's  $\alpha$  coefficient of teacher self-efficacy in this study was 0.87.

##### 3.2.4. Emotional Exhaustion

Teachers' emotional exhaustion was measured by the five-item scale extracted from the Maslach Burnout Inventory-General Survey [29]. These items were slightly adapted to suit the context of online teaching. An example is "I feel very tired to face the day's online teaching work every morning when I get up." The Cronbach's  $\alpha$  coefficient of emotional exhaustion in this study was 0.91.

##### 3.2.5. Teaching Satisfaction

A four-item scale adapted from Grace et al., was used to measure teachers' satisfaction with online teaching [38]. An example of the items is "Overall, I am satisfied with my

online teaching quality.” The Cronbach’s  $\alpha$  coefficient of teaching satisfaction in this study was 0.91.

### 3.2.6. Intention to Use Online Teaching in the Future

A four-item scale adapted from Yin et al., was used to measure university teachers’ intentions to use online teaching in the future [39]. A sample item is “I am going to continue the mode of online teaching in my courses in the future.” The Cronbach’s  $\alpha$  coefficient of intention to use online teaching in the future in this study was 0.89.

As previously mentioned, the wording of all items was slightly modified to accommodate the elements of online teaching. All items were scored on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree).

### 3.3. Analytic Procedure

SPSS were used to calculate descriptive information and Cronbach’s  $\alpha$  of relevant variables. The OMEGA macro for SPSS was used to calculate McDonald’s  $\omega$ . In order to confirm the construct validity (including convergent and discriminant validity) of relevant constructs. Confirmatory factor analysis (CFA) was conducted in Mplus to obtain the factor loadings for relevant constructs, which in turn were used to calculate composite reliability (CR) and average variance extracted (AVE). Confirmatory rather than exploratory factor analysis was used to calculate factor loadings since all scales used in this study were all well-established scales. The CFA results TPACK, work engagement, teacher efficacy, emotional exhaustion, teaching satisfaction and intention to use online teaching in feature were satisfactory:  $\chi^2 = 7536.99$ ,  $df = 480$ , CFI = 0.91, TLI = 0.91, RMSEA = 0.073, and SRMR = 0.038. CR and McDonald’s  $\omega$  are less biased estimates of reliability than Cronbach’s  $\alpha$ , and values greater than 0.7 indicating good reliability. AVE greater than 0.5 indicates good convergent validity, while square root of AVE greater than construct correlations indicates good discriminant validity.

The PROCESS macro for SPSS [40,41] was used to test the relationships between variables of interest. The PROCESS macro was developed by Andrew F. Hayes, and it provides a relatively simple way to test various types of mediating and moderating effects. The standardized values of all variables were calculated and used in the tested model in order to alleviate multicollinearity and to obtain standardized estimates. The interaction term (TPACK  $\times$  Engagement) was calculated by multiplying the standardized values of TPACK and work engagement. A total of three models were tested for the three outcome variables (i.e., emotional exhaustion, teaching satisfaction, and future intention), respectively. Template Model 8 was specified in the data analysis with TPACK entered as the X variable, teacher efficacy as the mediator M, work engagement as the moderator variable W, and an outcome variable as the Y variable. Teachers’ gender, years of experience, and educational background were also entered as control variables. Following Preacher et al., bootstrapping techniques were used to assess the significance of the conditional indirect effects (95% confidence intervals, number of bootstrap samples = 5000) [40].

## 4. Results

### 4.1. Descriptive Statistics, Reliability, Validity and Correlations

The results of descriptive statistics (M and SD), reliability (CR, Cronbach’s  $\alpha$ , McDonald’s  $\omega$ ), and convergent validity (AVE) for each variable and the latent correlations between the relevant variables are presented in Table 1. The results show that teachers reported having relatively high levels of work engagement (M = 3.98) and teaching self-efficacy (M = 4.12), and relatively low levels of emotional exhaustion (M = 3.08), although there were considerable individual differences, with SD values ranging from 0.90 to 1.08. TPACK was significantly and moderately related to most other variables ( $r$  values ranging from 0.44 to 0.54), and negatively related to emotional exhaustion ( $r = -0.22$ ). Moderate to strong positive correlations were found between work engagement, teacher self-efficacy, teaching satisfaction, and intention to use online teaching in the future. Teachers’ demo-

graphic information was only weakly, if at all, related to the relevant variables. The values of CR, Cronbach's  $\alpha$ , and McDonald's  $\omega$  were all greater than 0.7, indicating good reliability of scales. The values of AVE were all greater than 0.5, indicating good convergent validity, and most of the square roots of AVE were greater than correlations between constructs, indicating acceptable discriminant validity.

**Table 1.** Latent correlation matrix, reliability, and validity of relevant constructs.

	TPACK	Engagement	Efficacy	EE	TS	Intention
TPACK	(0.79)					
Engagement	0.55	(0.84)				
Efficacy	0.60	0.88	(0.76)			
EE	−0.24	−0.44	−0.39	(0.81)		
TS	0.48	0.86	0.79	−0.46	(0.85)	
Intention	0.47	0.81	0.74	−0.37	0.97	(0.83)
CR	0.91	0.96	0.87	0.91	0.91	0.90
AVE	0.62	0.71	0.58	0.66	0.72	0.68
M	3.70	3.98	4.12	3.08	3.54	3.44
SD	0.59	1.00	0.90	1.08	0.77	0.79
Cronbach's $\alpha$	0.91	0.96	0.87	0.91	0.91	0.89
McDonald's $\omega$	0.91	0.96	0.87	0.91	0.91	0.90

Notes:  $\chi^2 = 7536.99$ ,  $df = 480$ , CFI = 0.91, TLI = 0.91, RMSEA = 0.073, and SRMR = 0.038. TPACK = Technological pedagogical content knowledge; EE = Emotional exhaustion; TS = Teaching satisfaction; Intention = Intention to use online teaching in future. CR = composite reliability; AVE = average variance extracted (convergent validity); M = Mean; SD = Standard deviation; Cronbach's  $\alpha$  = internal consistency; McDonald's  $\omega$  was calculated from exploratory factor analysis using maximum likelihood (ML) extraction. The square roots of AVE were presented in parentheses.

#### 4.2. Moderating Effects

The tested models were consistent with Edwards and Lambert's direct effect and first-stage moderation model [42]. Specifically, teacher efficacy mediated the relationship between TPACK and teachers' well-being and intention, and work engagement moderated the path from TPACK to teacher self-efficacy and that from TPACK to teachers' well-being and intention.

Three sets of models were tested in the present study, with emotional exhaustion, teaching satisfaction, and future intention entered as dependent variables (DV), respectively. Testing these models involves estimating the following equations:

$$\text{Efficacy} = b_0 + b_1 \times \text{TPACK} + b_2 \times \text{engagement} + b_3 \times \text{TPACK} \times \text{Engagement} + b_i \times \text{Control variable}_i + e, \quad (1)$$

$(i = 4, 5, 6)$

$$\text{DV} = b_0 + b_1 \times \text{TPACK} + b_2 \times \text{engagement} + b_3 \times \text{efficacy} + b_4 \times \text{TPACK} \times \text{Engagement} + b_i \times \text{Control variable}_i + e, \quad (2)$$

$(i = 5, 6, 7)$

In the two equations, control variables refer to gender, years of experience, and educational background, and  $e$  is an error term.

The results of the three sets of models are synthesized and presented in Table 2. In Equation (1) of all three models, teacher self-efficacy (i.e., the mediator) was treated as the dependent variable, and TPACK, work engagement, the interaction term, and covariates were used as the predictors. Therefore, the results for teacher self-efficacy were the same across the three tested model sets (i.e., Model M). In Equation (2) of these models, TPACK, work engagement, their interaction term, teacher efficacy, and covariates were used as the predictors, and emotional exhaustion, teaching satisfaction, and future intention were treated as outcome variables in turn (i.e., Model O1 to Model O3).

**Table 2.** The results of the moderated mediation model.

Predictors	M: Teacher Efficacy		O1: Emotional Exhaustion		O2: Teaching Satisfaction		O3: Intention	
	$\beta$	SE	B	SE	$\beta$	SE	$\beta$	SE
Constant	−0.08	0.07	0.18	0.11	−0.18 **	0.07	−0.04	0.08
TPACK	0.17 ***	0.01	−0.01	0.02	0.02	0.01	0.05 **	0.02
Work engagement	0.71 ***	0.01	−0.35 ***	0.03	0.62 ***	0.02	0.59 ***	0.02
Efficacy			−0.06 *	0.03	0.20 ***	0.02	0.16 ***	0.02
TPACK × Engagement	−0.01	0.01	0.01	0.01	0.03 **	0.01	0.04 ***	0.01
Gender	0.02	0.02	0.01	0.04	0.07 **	0.02	0.05	0.03
Yrs of exp.	0.01	0.01	−0.02	0.01	−0.01	0.01	<0.01	0.01
Edu. Background	0.01	0.02	−0.06 *	0.03	0.04	0.02	−0.02	0.02

Notes: M: = Model M for the mediator; O1–O3: Model O1, Model O2, and Model O3 for each of three outcome variables;  $\beta$  =  $\beta$  coefficient; SE = standard error; Intention = Intention to use online teaching in future; TPACK = Technological pedagogical content knowledge; Yrs of exp. = Years of experience; Edu. Background = Educational background. \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ .

As shown in Model M, both TPACK and work engagement were positively related to teacher self-efficacy (TPACK:  $\beta = 0.17$ ,  $p < 0.001$ ; engagement:  $\beta = 0.71$ ,  $p < 0.001$ ), although the  $\beta$  coefficient of their interaction term was not significant (TPACK × Engagement:  $\beta = -0.01$ , n.s.). The results indicated that work engagement did not moderate the relationship between TPACK and teacher self-efficacy. Therefore, H1a and H2a were supported, while H3a was not.

As shown in Model O1 to Model O3, both work engagement and teacher self-efficacy were significantly and negatively related to emotional exhaustion (engagement:  $\beta = -0.35$ ,  $p < 0.001$ ; efficacy:  $\beta = -0.06$ ,  $p < 0.05$ ), and positively related to teaching satisfaction (engagement:  $\beta = 0.62$ ,  $p < 0.001$ ; efficacy:  $\beta = 0.20$ ,  $p < 0.001$ ) and intention to use online teaching in the future (engagement:  $\beta = 0.59$ ,  $p < 0.001$ ; efficacy:  $\beta = 0.16$ ,  $p < 0.001$ ). TPACK was not significantly related to teachers' emotional exhaustion ( $\beta = -0.01$ , n.s.) or teaching satisfaction ( $\beta = 0.02$ , n.s.), but was positively related to their future intention ( $\beta = 0.05$ ,  $p < 0.01$ ). The  $\beta$  coefficient of the interaction term (i.e., TPACK × Engagement) was not significant for emotional exhaustion ( $\beta = 0.01$ , n.s.), but was significant and positive for teaching satisfaction ( $\beta = 0.03$ ,  $p < 0.01$ ) and future intention ( $\beta = 0.04$ ,  $p < 0.001$ ). The results indicated that TPACK and work engagement enhanced each other in predicting teachers' satisfaction and intention, but not emotional exhaustion. The results also indicated that teacher efficacy fully mediated the relationship between TPACK and exhaustion and satisfaction, and partially mediated that between TPACK and future intention. Therefore, H1d, H2a–H2d, and H3c–H3d were supported, while H1b–H1c, H3b were not supported.

#### 4.3. Direct and Indirect Effects

Table 3 shows the estimates and 95% confidence intervals for the conditional direct effects and the estimates and bootstrap 95% confidence intervals for the conditional indirect effects. The results for conditional direct effects are presented in the upper part of Table 3. As shown in the results, there was no significant conditional direct effect of TPACK on emotional exhaustion: when the level of work engagement was one standard deviation above/below its mean (i.e.,  $\pm 1$  SD engagement), the confidence intervals of estimates included zero, indicating a non-significant direct effect of TPACK on emotional exhaustion.

However, there were significant conditional direct effects of TPACK on teaching satisfaction and intention to use online teaching in the future: when the level of work engagement was one standard deviation above its mean (i.e., +1 SD engagement), the confidence intervals of estimates were greater than zero, indicating positive direct effects of TPACK on teaching satisfaction and intention; when the level of work engagement was one standard deviation below its mean (i.e., −1 SD engagement), the confidence intervals of estimates included zero, indicating non-significant direct effects of TPACK on teaching satisfaction and intention. In other words, the direct effects of TPACK on teaching

satisfaction and future intention were significant only when the level of engagement was high.

**Table 3.** The results of conditional (moderated) direct and indirect effect.

		Est.	SE/BootSE	95% Confidence Intervals	
Level of Engagement					
Conditional direct effect			SE	LLCI	ULCI
TPACK on EE	−1 SD	−0.01	0.02	−0.06	0.04
	+1 SD	0.00	0.03	−0.05	0.05
TPACK on TS	−1 SD	−0.01	0.02	−0.04	0.02
	+1 SD	0.04	0.02	0.01	0.08
TPACK on FI	−1 SD	0.02	0.02	−0.02	0.05
	+1 SD	0.09	0.02	0.05	0.12
Conditional indirect effect			BootSE	BootLLCI	BootULCI
TPACK on EE via efficacy	−1 SD	−0.01	0.01	−0.02	0.00
	+1 SD	−0.01	0.01	−0.02	0.00
TPACK on TS via efficacy	−1 SD	0.04	0.01	0.03	0.05
	+1 SD	0.03	0.01	0.02	0.04
TPACK on FI via efficacy	−1 SD	0.03	0.01	0.02	0.04
	+1 SD	0.03	0.00	0.02	0.04

Notes: Est. = estimates; SE = standard error; LLCI = lower-level confidence interval; ULCI = upper-level confidence interval; BootSE = bootstrap standard error; BootLLCI = lower-level bootstrap confidence interval; BootULCI = upper-level bootstrap confidence interval; SD = standard deviation; TPACK = Technological pedagogical content knowledge; EE = Emotional exhaustion; TS = Teaching satisfaction; FI = Intention to use online teaching in future.

The results for conditional indirect effects are presented in the lower part of Table 3. There was no significant conditional indirect effect of TPACK on emotional exhaustion via teacher self-efficacy: when the level of work engagement was one standard deviation above/below its mean (i.e.,  $\pm 1$  SD engagement), the bootstrap confidence intervals of estimates included zero, indicating a non-significant indirect effect of TPACK on emotional exhaustion via teacher self-efficacy. However, there were significant indirect effects of TPACK on teaching satisfaction and future intention via teacher self-efficacy: when the level of work engagement was one standard deviation above/below its mean (i.e.,  $\pm 1$  SD engagement), the bootstrap confidence intervals of estimates were all greater than zero, indicating positive indirect effects of TPACK on teaching satisfaction and future intention via teacher self-efficacy. In other words, the indirect effects of TPACK on teaching satisfaction and future intention were positive and significant, and were not contingent on the level of engagement. Therefore, H4b was not supported, while H4c–H4d were supported.

## 5. Discussion

University teachers have been faced with tremendous changes and challenges during the COVID-19 pandemic. This study identified two factors (i.e., teachers' TPACK and work engagement) that are important for teachers to cope with these changes and challenges, and may contribute to their self-efficacy for online teaching, well-being, and intention to use online learning in the future.

### 5.1. Results Interpretation

The results of the present study were threefold. First, both TPACK and work engagement were positively related to teachers' self-efficacy, teaching satisfaction, and future intention, and negatively related to their emotional exhaustion. Second, work engagement did not moderate the relationship between TPACK and teacher self-efficacy, but moderated the relationships between TPACK and two of the three outcome variables (i.e., teaching satisfaction and future intention). The direct, positive effects of TPACK on teaching satisfaction and future intention were only found when teachers reported to have higher

levels of work engagement. Third, teacher self-efficacy fully mediated the relationship between TPACK and exhaustion and satisfaction, and partially mediated that between TPACK and future intention. However, the results of conditional indirect effect suggested that the indirect effect of TPACK on emotional exhaustion via teacher self-efficacy was not significant. These findings are helpful for understanding the well-being and professional lives of university teachers during the COVID-19 pandemic, and elicit the following issues worthy of further discussion.

### 5.2. Theoretical Implications

The results of the present study generally support Bandura's theory of self-efficacy and its sources [4]. Among the four sources of efficacy beliefs, namely, mastery experiences, physiological and emotional states, vicarious experience, and verbal persuasion [4], teachers' first-hand experience of success and relevant physiological and emotional states are of more relevance and importance during social distancing and quarantine, and therefore, the roles of teachers' TPACK and work engagement were the focus of the current study. TPACK, which represents the synthesis of teacher knowledge about teaching content, pedagogical methods, and technological skills, is closely related to teachers' mastery experience during online teaching, while work engagement, which reflects teachers' three pervasive, affective-cognitive states (i.e., vigor, dedication, and absorption), also represents physiological and emotional states of teachers during their teaching. Our results indicated that both TPACK and work engagement were positively related to teachers' self-efficacy, supporting that mastery experiences and physiological and emotional states can be important sources of university teachers' efficacy beliefs [4–6]. The results also showed that work engagement was more predictive of teacher self-efficacy than TPACK. This result also echoes Côté and Levine's findings that attitude or motivation is more important than aptitude for positive higher-educational outcomes [43].

However, the results of moderating analysis indicated that work engagement did not moderate the relationship between TPACK and teacher self-efficacy. In other words, work engagement and TPACK did not enhance each other in predicting teacher self-efficacy. It is possibly because the four sources of efficacy beliefs may be more mutually independent than we previously thought. Therefore, there is no synergy effect among them that makes the effect of A and B together greater than the sum of the effects of A and B when present separately. Moreover, teachers' TPACK represents the synthesized knowledge of content, pedagogy, and technology, while work engagement reflects teachers' positive, energetic emotional experiences in various aspects of online teaching. By nature, the former is cognitive while the latter is affective. The discrepancy between them may make it difficult to exert any synergy effect between these two. More effort is needed in future to examine the possible synergy effect of different sources of efficacy beliefs. With this knowledge, we may know more about how to take full advantage of the effects of multiple efficacy information sources and their synergy effect to build teacher self-efficacy.

The three outcome variables used in the present study reflect different aspects of teachers' well-being and intention. Emotional exhaustion is a direct, reactive, emotional response towards job-related stress, teaching satisfaction reflects individuals' cognitive evaluation of various aspects of their job, and intention to use online learning in the future represents teachers' behavioral intention based on these emotional states and cognitive evaluations [30,34,36]. Our results showed different patterns of effect on these outcome variables. Specifically, the total effect of TPACK on emotional exhaustion was not significant (non-significant direct and indirect effects), while teacher self-efficacy fully mediated the relationship between TPACK and teaching satisfaction (non-significant direct effect and significant indirect effect), and partially mediated that between TPACK and future intention (significant direct and indirect effects). It seems that teachers who reported to have more knowledge on technical, pedagogical, and subject matter generally demonstrate better ability in their online teaching, and thus had more desirable evaluation of their job and were more willing to adopt online teaching in the future. However, teachers' relevant

knowledge may not lead to or buffer against their emotional exhaustion. These results were consistent with Yin et al.'s finding that emotional job demands and intensive interpersonal interaction rather than the cognitive aspect of teachers' jobs are predictive of teachers' emotional exhaustion [33].

Moreover, the moderating effects of work engagement were only found for the direct effect of TPACK on teaching satisfaction and future intention but not on emotional exhaustion. TPACK was significantly and positively related to teaching satisfaction and future intention only when teachers reported higher levels of work engagement. On the one hand, these results echo the results of mediating analysis which suggested that TPACK is more closely related to the cognitive rather than the affective aspect of teachers' well-being and intention. On the other hand, these results also highlight that the beneficial effect of TPACK is only salient when teachers devote themselves to their online teaching and demonstrate due vigor, dedication, and absorption. Without a high level of work engagement, teachers' TPACK alone can hardly bring positive outcomes.

Regardless of these different results, the three factors, namely, teachers' TPACK, work engagement, and teacher self-efficacy were generally adaptive and had a positive impact on university teachers' well-being and intention to use online teaching in the future. In general, these results are consistent with previous findings on teachers' TPACK, work engagement, and self-efficacy [7,14,21,22].

### 5.3. Practical Applications

Online teaching during the COVID-19 pandemic has its unique features. University teachers were working from home and delivered their lectures via the Internet. Isolated from students and colleagues, teachers may find it extremely stressful to cope with the challenges of the online teaching mode. In turn, they may feel less capable, display more symptoms of ill-being, and be reluctant to use online learning in their future teaching.

The shift from traditional face-to-face classroom teaching towards online learning was sudden and unexpected, and most teachers were not really prepared for it. During the COVID-19 pandemic, most university teachers may have received less support than usual from their institutions and colleagues when delivering online teaching. They had to cope with the uneasy feelings caused by the pandemic, the extra family burden of caring for school-age children, and changing epidemic prevention measures [1].

Compared with their counterparts in primary and secondary schools who have much heavier teaching loads, university teachers may have more latitude to adapt themselves to the new online teaching mode. However, the results of descriptive information showed that among the three adaptive factors, TPACK had the lowest mean score, followed by work engagement and teacher self-efficacy. This again raises the concern that much less attention has been paid to university teachers' TPACK than that of primary and secondary school teachers. The results of the present study showed that university teachers' TPACK contributed to their sense of efficacy, which was in turn negatively related to emotional exhaustion and positively related to teaching satisfaction and future intention. Moreover, teachers' TPACK directly contributed to teachers' teaching satisfaction and future intention when they also reported higher levels of work engagement. However, even for primary and secondary school teachers, there are a number of challenges to deal with in using ICT.

Compared with TPACK, teachers' work engagement was more predictive of teacher self-efficacy than TPACK. It seems that teachers' positive, affective states or attitudes towards their online teaching are more critical than their relevant skills or abilities. Therefore, more effort should be made to increase university teachers' knowledge of ICT integration, to promote their TPACK, and to enhance their work engagement.

### 5.4. Limitations

The most salient limitation of this study concerns the data collection procedure and the special sample features that resulted. Since the questionnaires were completed on a voluntary basis, it is possible that the teachers participated in this study were more

integrated in the systemic relations of universities in China and less satisfied by the current situation. They also tended to be more extravertive, proactive and engaged than those who did not participate. While the self-selection bias is basically inevitable in all voluntary survey, we do believe a more balanced sample will contribute to the generalizability of the research findings. Another limitation of this study concerns the discriminant validity of scales. The strength of relationships observed in current study could be overestimated.

## 6. Conclusions

University teachers' well-being during the COVID-19 pandemic is an interesting and important topic to explore. People may wonder if more synthesized knowledge of content, pedagogy, and technology contributes to greater satisfaction with online teaching and more willingness to use online teaching in the future. Based on a sample of 2763 university teachers in China, this study found that teachers' TPACK contributed to their teaching satisfaction and future intention via self-efficacy, and when teachers reported higher levels of work engagement. These findings help unravel the professional lives of university teachers during the pandemic, and shed light on how to promote online teaching in higher education in the future.

**Author Contributions:** Conceptualization, methodology, formal analysis, and writing—original draft preparation, S.H.; validation and writing—original draft preparation, fund acquisition, supervision, H.Y. and Y.J.; Methodology, writing—review and editing, W.W. All authors have read and agreed to the published version of the manuscript.

**Funding:** This research was funded by the General Research Fund of Hong Kong SAR [grant number CUHK14618118] and the National Social Science Fund of China (Education, 2021) under the project "Towards a Comprehensive Management of Academic Burden in Chinese Compulsory Education" (grant number AHA210009).

**Institutional Review Board Statement:** The study was conducted in accordance with the Declaration of Helsinki, and approved by the Survey and Behavioural Research Ethics Committee, the Chinese University of Hong Kong (Approval Code RGC GRF 14618118 and date of approval 26 October 2019).

**Informed Consent Statement:** Informed consent was obtained from all subjects involved in the study.

**Data Availability Statement:** The data presented in this study are available on request from the corresponding author. The data are not publicly available due to the ethical requirement.

**Conflicts of Interest:** The authors declare no conflict of interest. The funders had no role in the design of the study, in the collection, analyses, or interpretation of data, in the writing of the manuscript, or in the decision to publish the results.

## References

1. Chtourou, H.; Trabelsi, K.; H'mida, C.; Boukhris, O.; Glenn, J.M.; Brach, M.; Bentlage, E.; Bott, N.; Shephard, R.J.; Ammar, A.; et al. Staying physically active during the quarantine and self-isolation period for controlling and mitigating the COVID-19 pandemic: A systematic overview of the literature. *Front. Psychol.* **2020**, *11*, 1708. [[CrossRef](#)] [[PubMed](#)]
2. Williamson, B.; Eynon, R.; Potter, J. Pandemic politics, pedagogies and practices: Digital technologies and distance education during the coronavirus emergency. *Learn. Media Technol.* **2020**, *45*, 107–114. [[CrossRef](#)]
3. Hjalmsdóttir, A.; Bjarnadóttir, V.S. "I have turned into a foreman here at home": Families and work-life balance in times of COVID-19 in a gender equality paradise. *Gender Work Organ.* **2021**, *28*, 268–283. [[CrossRef](#)] [[PubMed](#)]
4. Bandura, A. *Self-Efficacy: The Exercise of Control*; Freeman: New York, NY, USA, 1997.
5. Tschannen-Moran, M.; Hoy, A.W.; Hoy, W.K. Teacher efficacy: Its meaning and measure. *Rev. Educ. Res.* **1998**, *68*, 202–248. [[CrossRef](#)]
6. Tschannen-Moran, M.; Hoy, A.W. Teacher efficacy: Capturing an elusive construct. *Teach. Teach. Educ.* **2001**, *17*, 783–805. [[CrossRef](#)]
7. Chai, C.S.; Chin, C.K.; Koh, J.H.L.; Tan, C.L. Exploring Singaporean Chinese language teachers' technological pedagogical content knowledge and its relationship to the teachers' pedagogical beliefs. *Asia-Pac. Educ. Res.* **2013**, *22*, 657–666. [[CrossRef](#)]
8. Cheng, S.L.; Xie, K. The relations among teacher value beliefs, personal characteristics, and TPACK in intervention and non-intervention settings. *Teach. Teach. Educ.* **2018**, *74*, 98–113. [[CrossRef](#)]
9. Benson, S.N.K.; Ward, C.L. Teaching with technology: Using TPACK to understand teaching expertise in online higher education. *J. Educ. Comput. Res.* **2013**, *48*, 153–172. [[CrossRef](#)]

10. Maslach, C.; Schaufeli, W.B.; Leiter, M.P. Job burnout. *Annu. Rev. Psychol.* **2001**, *52*, 397–422. [[CrossRef](#)]
11. Tse, D.C.; Nakamura, J.; Csikszentmihalyi, M. Beyond challenge-seeking and skill-building: Toward the lifespan developmental perspective on flow theory. *J. Posit. Psychol.* **2020**, *15*, 171–182. [[CrossRef](#)]
12. Luthans, F.; Youssef, C.M.; Avolio, B.J. *Psychological Capital: Developing the Human Competitive Edge*; Oxford University Press: Oxford, UK, 2007.
13. Goddard, R.D.; Hoy, W.K.; Hoy, A.W. Collective efficacy beliefs: Theoretical developments, empirical evidence, and future directions. *Educ. Res.* **2004**, *33*, 3–13. [[CrossRef](#)]
14. Klassen, R.M.; Tze, V.M.C.; Betts, S.M.; Gordon, K.A. Teacher efficacy research 1998–2009: Signs of progress or unfulfilled promise? *Educ. Psychol. Rev.* **2011**, *23*, 21–43. [[CrossRef](#)]
15. Morris, D.B.; Usher, E.L.; Chen, J.A. Reconceptualizing the sources of teaching self-efficacy: A critical review of emerging literature. *Educ. Psychol. Rev.* **2017**, *29*, 795–833. [[CrossRef](#)]
16. Tschannen-Moran, M.; McMaster, P. Sources of self-efficacy: Four professional development formats and their relationship to self-efficacy and implementation of a new teaching strategy. *Elem. Sch. J.* **2009**, *110*, 228–245. [[CrossRef](#)]
17. Schunk, D.; Pajares, F. Self-efficacy theory. In *Handbook of Motivation in School*; Wentzel, K.R., Wigfield, A., Eds.; Taylor Francis: New York, NY, USA, 2009; pp. 35–54.
18. Yin, H.; Han, J.; Perron, B.E. Why are Chinese university teachers (not) confident in their competence to teach? The relationships between faculty-perceived stress and self-efficacy. *Int. J. Educ. Res.* **2020**, *100*, 101529. [[CrossRef](#)]
19. Shulman, L.S. Those who understand: Knowledge growth in teaching. *Educ. Res.* **1986**, *15*, 4–14. [[CrossRef](#)]
20. Shulman, L.S. Knowledge and teaching: Foundations of the new reform. *Harv. Educ. Rev.* **1987**, *57*, 1–22. [[CrossRef](#)]
21. Voogt, J.; Fisser, P.; Pareja Roblin, N.; Tondeur, J.; van Braak, J. Technological pedagogical content knowledge—A review of the literature. *J. Comput. Assist. Learn.* **2013**, *29*, 109–121. [[CrossRef](#)]
22. Schaufeli, W.B.; Bakker, A.B.; Salanova, M. The measurement of work engagement with a short questionnaire: A cross-national study. *Educ. Psychol. Meas.* **2006**, *66*, 701–716. [[CrossRef](#)]
23. Luthans, F. The need for and meaning of positive organizational behavior. *J. Organ. Behav.* **2002**, *23*, 695–706. [[CrossRef](#)]
24. Schaufeli, W.B.; Bakker, A.B. *Test Manual for the Utrecht Work Engagement Scale*; Unpublished Manuscript; Department of Psychology, Utrecht University: Utrecht, The Netherlands, 2003.
25. Shirom, A. Vigor as a positive affect at work: Conceptualizing vigor, its relations with related constructs, and its antecedents and consequences. *Rev. Gen. Psychol.* **2011**, *15*, 50–64. [[CrossRef](#)]
26. Csikszentmihalyi, M.; Montijo, M.N.; Mouton, A.R. Flow theory: Optimizing elite performance in the creative realm. In *APA Handbook of Giftedness and Talent*; Pfeiffer, S.I., Shaunessy-Dedrick, E., Foley-Nicpon, M., Eds.; American Psychological Association: Washington, DC, USA, 2018; pp. 215–229.
27. Humphrey, R.H.; Ashforth, B.E.; Diefendorff, J.M. The bright side of emotional labor. *J. Organ. Behav.* **2015**, *36*, 749–769. [[CrossRef](#)]
28. Kristof-Brown, A.; Guay, R.P. Person–environment fit. In *APA Handbook of Industrial and Organizational Psychology*; Zedeck, S., Ed.; American Psychological Association: Washington, DC, USA, 2011; Volume 3, pp. 3–50.
29. Maslach, C.; Jackson, S.E. *MBI: Maslach Burnout Inventory*; University of California: Oakland, CA, USA, 1986.
30. Grandey, A.A. Emotion regulation in the workplace: A new way to conceptualize emotional labor. *J. Occup. Health Psychol.* **2000**, *5*, 95–110. [[CrossRef](#)] [[PubMed](#)]
31. Landy, F.J. *Psychology of Work Behavior*; Thomson Brooks: Pacific Grove, CA, USA, 1989.
32. Kinman, G.; Wray, S.; Strange, C. Emotional labour, burnout and job satisfaction in UK teachers: The role of workplace social support. *Educ. Psychol.* **2011**, *31*, 843–856. [[CrossRef](#)]
33. Yin, H.; Huang, S.; Chen, G. The relationships between teachers’ emotional labor and their burnout and satisfaction: A meta-analytic review. *Educ. Res. Rev.* **2019**, *28*, 100283. [[CrossRef](#)]
34. Eccles, J.S.; Adler, T.F.; Futterman, R.; Goff, S.B.; Kaczala, C.M.; Meece, J.L. Expectancies, values and academic behaviors. In *Achievement and Achievement Motivation*; Spence, J.T., Ed.; Freeman: San Francisco, CA, USA, 1983; pp. 75–146.
35. Ajzen, I. The theory of planned behavior. *Organ. Behav. Hum. Decis. Process.* **1991**, *50*, 179–211. [[CrossRef](#)]
36. Ajzen, I.; Fishbein, M. Attitudes and the attitude-behavior relation: Reasoned and automatic processes. *Eur. Rev. Soc. Psychol.* **2000**, *11*, 1–33. [[CrossRef](#)]
37. Yin, H.; Lee, J.C.K.; Jin, Y.L.; Zhang, Z.H. The effect of trust on teacher empowerment: The mediation of teacher efficacy. *Educ. Stud.* **2013**, *39*, 13–28. [[CrossRef](#)]
38. Grace, D.; Weaven, S.; Bodey, K.; Ross, K.; Weaven, K. Putting student evaluations into perspective: The course experience quality and satisfaction model (CEQS). *Stud. Educ. Eval.* **2012**, *38*, 35–43. [[CrossRef](#)]
39. Yin, H.; Lee, J.C.K.; Jin, Y. Teacher receptivity to curriculum reform and the need for trust: An exploratory study from Southwest China. *Asia-Pac. Educ. Res.* **2011**, *20*, 35–47.
40. Preacher, K.J.; Rucker, D.D.; Hayes, A.F. Addressing moderated mediation hypotheses: Theory, methods, and prescriptions. *Multivar. Behav. Res.* **2007**, *42*, 185–227. [[CrossRef](#)] [[PubMed](#)]
41. Hayes, A.F. *An Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-Based Approach*; The Guilford Press: New York, NY, USA, 2012.

- 
42. Edwards, J.R.; Lambert, L. Methods for integrating moderation and mediation: A general analytical framework using moderated path analysis. *Psychol. Methods* **2007**, *12*, 1–22. [[CrossRef](#)] [[PubMed](#)]
  43. Côté, J.E.; Levine, C.G. Attitude versus aptitude: Is intelligence or motivation more important for positive higher-educational outcomes? *J. Adolesc. Res.* **2000**, *15*, 58–80. [[CrossRef](#)]