JEELS
(Journal of English Education and Linguistics Studies)
P-ISSN: 2407-2575 E-ISSN: 2503-2194
https://jurnalfaktarbiyah.iainkediri.ac.id/index.php/jeels

LEARNERS ENGAGEMENT IN ONLINE TEACHER PROFESSIONAL DEVELOPMENT: SCALE DEVELOPMENT AND VALIDATION

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Abstract: Research has shown that effective online teacher professional development (OTPD) requires teachers to learn and engage professionally to become high-quality teachers. Understanding teachers' engagement as learners in OTPD is crucial as such engagement indicates active learning, interaction, and collaboration with other teachers. Nevertheless, there has not been any instrument measuring how teachers behave (behavioral), feel (emotional), think (cognitive), and socialize (social). Therefore, the goal of the present study was to create a context-specific survey instrument to measure the engagement of EFL teachers in OTPD. This study, using the research and development (R&D) method, involved 385 Indonesian in-service EFL

[1]**Citation in APA style:**
Taloko, J.L., Rachmajanti, S., Ivone, F.M. (2024). Learners engagement in online teacher professional development: Scale development and validation. *JEELS, 11*(2), 653-681.
DOI: 10.30762/jeels.v11i2.2966

Submission: May 2024, Revision: July 2024, Publication: September 2024

teachers in nine universities conducting OTPD in Indonesia. The statistical results of explanatory (EFA) and confirmatory factor analyses (CFA) confirmed the four-dimensional construct in the OTPD Learner Engagement Instrument, mainly behavioral, emotional, cognitive, and social dimensions of engagement. The study's policy and practical implications addressing the policymakers, institutions, and future research were also presented.

Keywords: *dimensions of engagement, in-service EFL teacher, learner engagement, online TPD*

INTRODUCTION

Improving teacher quality as a means of enhancing the quality of education has become a major concern for countries around the globe (Harjanto et al., 2018; Keengwe & Kang, 2013). Teacher quality determines student achievement and school quality based on what and how teachers teach in the classroom (Keengwe & Kang, 2013). In the current 21st century, it is pivotal for EFL teachers to be up to date with current trends and master technology and implement it in the classrooms (Rachmajanti et al., 2020). It requires teachers to learn and develop themselves professionally to become high-quality teachers. In that case, teacher professional development (TPD) for teachers is crucial.

Desimone (2009) argues that effective TPD consists of five key elements, mainly content focus, active learning, coherence, duration, and collective participation. The last element is a powerful force of teacher learning to stimulate potential interaction and engagement. Engagement in TPD, referring to teachers' pedagogical motivation and efforts (Jiang et al., 2019), is important because it leads to the feeling of satisfaction and success (Dyment et al., 2013), improves the quality of teachers' interactions (Williford et al., 2017), student outcome in learning (Koh et al., 2017), teachers' knowledge and instructional practices (Avillanova & Kuswandono, 2019), and facilitates collaboration (Beni et al., 2021). Studies on teacher engagement in TPD,

particularly in online mode (OTPD), have been investigated by some scholars, such as Beni et al. (2021), Compen et al. (2020), and Picard & Kutsyuruba (2017). Picard and Kutsyuruba (2017), for example, investigated teacher interaction, whereas Beni et al. (2021) aimed at the teachers' collaboration with other participants in OTPD. Another research shows that effective technology-focused professional development occurs when teachers learn as learners (Curwood, 2011).

Depite this myriad of previous studies investigating teacher engagement in OTPD, there has not been been any instrument to measure how teachers engage themselves in OTPD as professional learners (Czerniawski, 2013; Derrington & Kirk, 2017; Pietarinen et al., 2016) using student engagement (Bowden et al., 2019; Fredricks et al., 2004) as a major point of reference. On the other hand, the term 'learner engagement' is used by Noe et al. (2010), Halverson & Graham (2019) and Deng et al. (2020). In this study, the term 'student engagement' and 'learner engagement' are used interchangably as 'student' and 'learner' generally refer to a similar agent. Student engagement considers how learners behave (behavioral), feel (emotional), think (cognitive), and socialize (course/class) in educationally purposeful activities (Coates, 2006; Avcı & Ergün, 2019).

Research on student engagement concluded that it had a multi-dimensional construct mainly behavior, emotional, and cognitive engagement (Bowden et al., 2019; Fredricks et al., 2004) and was applied in investigating student engagement in various contexts by Kuh (2009), Fredricks et al. (2011), Dobbins and Denton (2017), and Raes et al. (2020). Behavior engagement refers to 'school-related conduct, involvement in learning, attendance, and participation in school-related activities' (Fredricks et al., 2019:1). The dimensions of behavior engagement include academic participation, following classroom norms (Gunuc & Kuzu, 2015), following rules (Gunuc & Kuzu, 2015; Sun & Rueda, 2012), making efforts (Burch et al., 2015; Dixson, 2015; Gunuc & Kuzu, 2015), paying attention, and asking questions (Sun & Rueda, 2012).

Emotional engagement covers 'students' positive and negative reactions to class and school, and relationships with teachers, peers, and school belonging or connectedness' (Fredricks et al., 2019:1). The dimensions of this engagement consist of positive reactions to teachers, classmates, academic staff and school (Burch et al., 2015; Deng et al., 2020; Gunuc & Kuzu, 2015; Sun & Rueda, 2012), willingness to do the work (Burch et al., 2015), student attitudes (Burch et al. 2015; Deng et al. 2020; Gunuc & Kuzu 2015), belonging (a feeling of being important) (Gunuc & Kuzu, 2015), value (an appreciation of success in school-related outcomes) (Sun & Rueda, 2012), interest (enjoyment of the activity) (Deng et al., 2020; Dixson, 2015; Sun & Rueda, 2012), and cost (negative aspects of engaging in the task) (Sun & Rueda, 2012).

Cognitive engagement includes 'self-regulated learning, perceived relevance of schoolwork, use of deep learning strategies, and exerting the necessary cognitive strategies for the comprehension of complex ideas' (Fredricks et al., 2019:2). Its dimension covers self-regulated (Sun & Rueda, 2012), willingness to use efforts to comprehend & master knowledge & skills (Deng et al., 2020; Dixson, 2015; Sun & Rueda, 2012), a desire to go beyond the requirement, flexibility in problem-solving (Sun & Rueda, 2012), preference for a challenge (Dixson, 2015), various learning strategies: summarizing, rehearsal, remembering, and so on (Deng et al., 2020), and investments (Gunuc & Kuzu, 2015). The constructs in cognitive engagement are also found in motivation literature, such as learning goals, valuing learning, striving for knowledge and mastery, and self-regulated learning (Fredricks et al., 2011). Scholars put their arguments that engagement and motivation are related (Fredricks et al., 2016). Dunn & Kennedy (2019) argued that motivation is the ignition of engagement. Motivation is manifested into behavioral (e.g., participation in classroom task), emotional/affective (e.g., interest and positive feelings about task), and cognitive (e.g., self-regulated learning and deep strategy use) engagement (Fredricks et al., 2016).

Later, a new dimension of engagement, social engagement, was introduced by Chen et al. (2018), Bowden et al. (2019), and Deng et al.

(2020) as it encapsulated educational engagement through interactions with instructors and peers. Social engagement considers the bonds of identification and belongingness between students and their peers as well as academic staff in their learning experience (Bowden et al., 2019). More precisely, it focuses on learner-instructor and learner-learner interactions (Deng et al., 2020). Though sometimes reported as a part of behavioral engagement due to observable instructors-peers interactions and a part of "ways of behaving" in educational activities, social engagement is another key component of the student learning experience and is treated separately from the other types of engagement. The dimensions of this type of engagement include participation (Burch et al., 2015; Gunuc & Kuzu, 2015), collaboration (Dixson, 2015), active learning (Deng et al., 2020; Dixson, 2015), feeling that belonging to a community (Dixson, 2015), online discussion (Deng et al., 2020; Dixson, 2015), post arguments & response, interaction with other students (Deng et al., 2020; Dixson, 2015), and feel as if they are engaging with real people (Gunuc & Kuzu, 2015).

The present study aims to develop a validated survey instrument for measuring teachers as professional learners' engagement in online teacher professional development (OTPD) consisting of the four dimensions above. Instruments measuring learner engagement in OTPD remain scarce in literature. For example, the existing instruments for measuring learners in online learning contexts developed by Sun & Rueda (2012) was intended to measure student engagement in online classes in a university context. The other instrument created by Deng et al. (2020) was to ivestigate learner engagement in MOOC (Massive Open Online Course). Developing a valid survey instrument to determine engagement in OTPD is pivotal to understand more comprehensively how teachers participate themselves actively in such a formal learning context as it shows their motivation and efforts to complete learning tasks based behavioral, emotional, cognitive, and social dimensions of engagement. Also, it can provide beneficial contribution to design more effective professional development activities for teachers.

METHOD

Research Design

Aiming to develop and validate an educational product in the form of a particular survey instrument, this study uses research and development (R&D) approach (Gall et al., 2003). The steps proposed by Deng et al. (2020) in developing and validating the survey instruments were utilized. The steps are described in Figure 1 below.

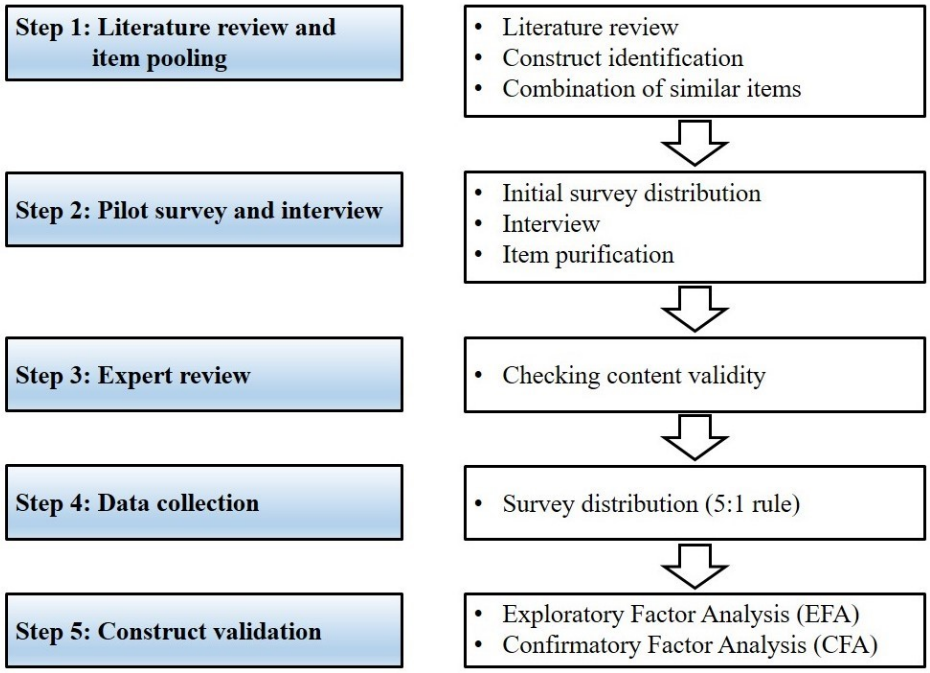

Figure 1. *Diagram of Survey Instrument Development*

Step 1: Literature review and item pooling

Student engagement served as the underlying theory discussed in the literature review. Extensive research mentioned that student engagement consists of has multi-dimensional construct, mainly behavioral, emotional, and cognitive dimensional engagement. Item pooling for the initial step of constructing the survey instrument was taken from the scales proposed by Sun and Rueda (2012), Deng et al. (2020), and Gunuc and Kuzu (2015) with the total of 73 items altogether.

Step 2: Pilot survey and interview

In this step, pilot survey as a draft survey was distributed to 21 non-targeted EFL in-service teachers. The results of the survey was used as a basis for interviewing these participants to gain their insights about the survey items for item purification.

Step 3: Expert review

After some items were added and omitted, three lecturers who had expertise in ELT and TPD were chosen to review 58 survey items for relevance, clarity, and simplicity of the survey.

Step 4: Data collection

According to Hair Jr et al. (2009), the number of participants answering the survey must be at least five times higher than the number of survey items in order to achieve statistical calculation purposes. Hence, the survey in the form of online questionnaire were distributed, targeting at least 300 participants.

Step 5: Construct validation

After collecting sufficient number of data, the final step was assessing the construct validity and reliability of the survey through Exploratory Factor Analysis (EFA), Cronbach's Alpha (α), and Confirmatory Factor Analysis (CFA) (Hair Jr et al., 2009). The modified survey instrument was later called OTPD Learner Engagement.

Research Context and Participants

The context of this study was an online teacher professional development program (OTPD) initiated by the Indonesian Ministry of Education called *PPG* (*Pendidikan Profesi Guru, Indonesian*) delivered online for in-service teachers around the country. *PPG* is a kind of teacher professional education to improve the quality of pre-service and in-service teachers. This study focused on in-service teachers teaching English subjects at schools. The participants of this study were 385 Indonesian in-service EFL teachers taking OTPD in nine different universities from 2020 to 2023 after they completed the final examination in the program. The English teachers joining that program were mostly female (72.2%) living in various islands or regions in

Indonesia, most of which are Java (57.1%) and Sumatra (20.3%). Almost all participants (90.4%) taught in secondary schools, both in junior and senior high schools. Moreover, the length of their teaching experience was mostly 6-10 years and 11-15 years covering up 81.1% of the participants. Table 1 shows more specific information about the participants.

Table 1.

The Demographic Information about the Participants

Variables	*Descriptions*	*Frequency*	*Percentage*
Gender	Male	107	27.8
	Female	278	72.2
Schools Taught	Elementary school	37	9.6
	Junior high school	169	43.9
	Senior high school	179	46.5
Teaching Experience	1-5 years	27	7.0
	6-10 years	157	40.8
	11-15 years	155	40.3
	16-20 years	26	6.8
	Above 20 years	20	5.2
Islands/regions	Java	220	57.1
	Sumatra	78	20.3
	Kalimantan	43	11.2
	Bali and Eastern Timor	25	6.5
	Riau Island and Bangka Belitung	7	1.8
	Sulawesi	6	1.6
	Papua	6	1.6

FINDINGS

OTPD Learner Engagement Scale Validity and Reliability

The following is the process of EFA of each dimension, e.g.: Behavioral, Emotional, Cognitive, and Social Dimensions.

EFA of Behavioral Dimension

The procedure and the results of calculating Exploratory Factor Analysis of behavioral dimension are explained in brief. First of all,

statistical computation on Kaiser-Meyer-Olkin Measure of Sampling Adequacy (.938) and Bartlett's Test of Sphericity (Chi-Square= 1860.53; *df*=66; *p*<.000) indicated that the data were highly suitable for factor analysis because a KMO value higher than 0.50 can be continued to the next statistical analysis (Gunuc & Kuzu, 2015). After that, EFA was performed using Principal Component Analysis (PCA) with Varimax rotation on 12 (twelve) questionnaire items. Items with factor loading (FL) less than .40 and cross loading above .40, and communalities (h2) below .40 were eliminated from the item pool (Hair Jr et al., 2009). Table 2 summarizes the results of analysis for each item in this dimension.

Table 2.

Construct validity, internal reliability, and descriptive data of Behavioral Engagement

Item	h^2	*FL*	*M (SD)*	$\overline{\mathbf{M}}$ ($\overline{\mathbf{SD}}$)	α
B00002	0.54	*0.74*	5.55 (0.59)	5.46 (0.64)	0.91
B00003	0.59	0.77	5.58 (0.57)		
B00004	0.58	0.76	5.38 (0.70)		
B00005	0.59	0.77	5.51 (0.64)		
B00006	0.44	0.66	5.44 (0.71)		
B00007	0.58	0.76	5.56 (0.58)		
B00008	0.61	0.78	5.38 (0.63)		
B00009	0.62	0.79	5.30 (0.66)		
B00010	0.62	0.78	5.34 (0.68)		
B00012	0.42	0.65	5.54 (0.65)		

Note: *h2*= Communalities; FL= Factor Loading; M=Mean; SD= Standard Deviation; α= Cronbach's Alpha

Table 2 shows that there are 10 (ten) items remaining which have communalities (h^2) value $\geq$ 0.40, ranging from 0.42 - 0.60, factor loading value $\geq$ 0.40, from 0.65 to 0.79, and Cronbach's Alpha internal consistency reliability coefficient is 0.91 which is higher than the minimum of 0.70 (Spencer, 2013). The cut-off point for FL was .40 (Gunuc & Kuzu, 2015). In addition, the mean average is 5.46 and, the standard deviation average is 0.64. The eigenvalues (5.58) yielded one component which accounted for 55.80% of the variance. Having h^2 and

FL above 0.40 and Cronbach's Alpha value of 0.91 indicates that the behavioral engagement items are worth processing for CFA.

EFA of Emotional Dimension

The procedure and the results of calculating Exploratory Factor Analysis of emotional dimension are explained in brief. First of all, statistical computation on Kaiser-Meyer-Olkin Measure of Sampling Adequacy (.93) and Bartlett's Test of Sphericity (Chi-Square= 3317.53; *df*=136; *p*<.000) indicated that the data were highly suitable for factor analysis. After that, EFA was performed using Principal Component Analysis (PCA) with Varimax rotation on 17 (seventeen) questionnaire items. Table 3 summarizes the results of analysis for each item in this dimension.

Table 3.

Construct validity, internal reliability, and descriptive data of Emotional Engagement.

Item	h^2	*FL*	*M (SD)*	$\overline{\mathbf{M}}$ ($\overline{\mathbf{SD}}$)	α
E00001	0.46	0.68	5.36 (0.66)	5.56 (0.58)	0.92
E00002	0.56	0.75	5.66 (0.53)		
E00003	0.52	0.72	5.73 (0.50)		
E00004	0.47	0.68	5.70 (0.51)		
E00005	0.41	0.64	5.51 (0.66)		
E00007	0.48	0.69	5.81 (0.44)		
E00008	0.53	0.73	5.46 (0.61)		
E00009	0.50	0.71	5.56 (0.60)		
E00010	0.52	0.72	5.40 (0.64)		
E00011	0.56	0.75	5.51 (0.61)		
E00012	0.52	0.72	5.58 (0.60)		
E00013	0.56	0.75	5.51 (0.58)		
E00014	0.54	0.73	5.60 (0.60)		
E00015	0.53	0.73	5.49 (0.61)		

Table 3 above shows that there are 14 (fourteen) items remaining which have communalities (h^2) value $\geq$ 0.40, ranging from 0.41 - 0.56, factor loading value $\geq$ 0.40, from 0.64 to 0.74, Cronbach's alpha is 0.92. In addition, the mean average is 5.56, and, the standard deviation average is 0.58. The eigenvalues (7.14) yielded one component which accounted for 51% of the variance. Having h^2 and FL

above 0.40 and Cronbach's alpha value 0.92 indicates that the emotional engagement items are worth processing for CFA.

EFA for Cognitive Dimension

The procedure and the results of calculating the Exploratory Factor Analysis of cognitive dimension are explained in brief. First of all, statistical computation on Kaiser-Meyer-Olkin Measure of Sampling Adequacy (.94) and Bartlett's Test of Sphericity (Chi-Square= 2949.81; *df*=136; *p*<.000) indicated that the data were highly suitable for factor analysis. After that, EFA was performed using Principal Component Analysis (PCA) with Varimax rotation on 17 (seventeen) questionnaire items. Table 4 below summarizes the results of analysis for each item in this dimension.

Table 4.

Construct validity, internal reliability, and descriptive data of Cognitive Engagement

Item	h^2	*FL*	*M (SD)*	$\overline{\mathbf{M}}$ ($\overline{\mathbf{SD}}$)	α
C00001	0.56	0.75	5.35 (0.62)	5.41 (0.64)	0.93
C00003	0.55	0.74	5.36 (0.65)		
C00004	0.54	0.73	5.30 (0.68)		
C00005	0.52	0.72	5.37 (0.65)		
C00006	0.61	0.78	5.38 (0.67)		
C00007	0.43	0.66	5.28 (0.73)		
C00008	0.51	0.71	5.44 (0.64)		
C00009	0.58	0.76	5.58 (0.59)		
C00010	0.51	0.72	5.45 (0.64)		
C00011	0.52	0.72	5.27 (0.72)		
C00014	0.45	0.67	5.36 (0.69)		
C00015	0.55	0.74	5.45 (0.56)		
C00016	0.47	0.69	5.65 (0.57)		
C00017	0.45	0.67	5.48 (0.58)		

Table 4 above shows that there are 14 (fourteen) items remaining that have commonalities (h^2) value $\geq$ 0.40 ranging from 0.43 - 0.61, factor loading value $\geq$ 0.40 from 0.67 to 0.75, a mean average is 5.41, and, standard deviation average is 0.64, and Cronbach's alpha is 0.93. The eigenvalues (7.25) yielded one component which accounted for 51.8% of the variance. Having h^2 and FL above 0.40 and Cronbach's

alpha value0.93 indicates that the cognitive engagement items are worth processing for CFA.

EFA for Social Dimension

The procedure and the results of calculating the Exploratory Factor Analysis of cognitive dimension are explained in brief. First of all, statistical computation on Kaiser-Meyer-Olkin= 0.94; *df*= 91; *p*<.000) indicated that the data were highly suitable for factor analysis. After that, EFA was performed using Principal Component Analysis (PCA) with Varimax rotation on 14 (fourteen) questionnaire items. Table 5 summarizes the results of analysis for each item in this dimension.

Table 5.

Construct validity, internal reliability, and descriptive data of Social Engagement

Item	h^2	*FL*	*M (SD)*	$\overline{\mathbf{M}}$ ($\overline{\mathbf{SD}}$)	α
S00003	0.41	0.64	5.39 (0.63)	5.36 (0.65)	0.92
S00006	0.46	0.68	5.12 (0.73)		
S00007	0.55	0.75	5.19 (0.74)		
S00008	0.60	0.78	5.32 (0.67)		
S00009	0.65	0.80	5.30 (0.67)		
S00010	0.74	0.86	5.35 (0.63)		
S00011	0.75	0.86	5.43 (0.62)		
S00012	0.63	0.80	5.52 (0.63)		
S00013	0.62	0.78	5.51 (0.63)		
S00014	0.60	0.77	5.52 (0.57)		

Table 5 above shows that there are 10 (ten) items remaining which have communalities (h^2) value $\geq$ 0.40 ranging from 0.41 - 0.75, factor loading value $\geq$ 0.40 from 0.64 to 0.86, the mean is 5.36 and, standard deviation is 0.65. The eigenvalues (5.63) yielded one component which accounted for 62.5% of the variance. Having h^2 and FL above 0.40 and Cronbach's alpha value 0.92 indicates that the social engagement items are worth-processing for CFA.

To sum up the statistical computation of the four dimensions of OTPD Learner Engagement above, here are the items that are further analyzed in Confirmatory Factor Analysis. Behavioral and Social Engagement contribute 10 (ten) items each, while Emotional and Cognitive Engagement 14 (fourteen) items each, Hence, there are 48 (forty-eight) items altogether.

CFA for All Dimensions of Learner Engagement

CFA calculation from the results of EFA process produces a model or a structure. The hypothesized four-factor structure shows the best model fit and reliability estimates among the four dimensions of engagement. The standardized path diagram for the structure is displayed in Figure 2.

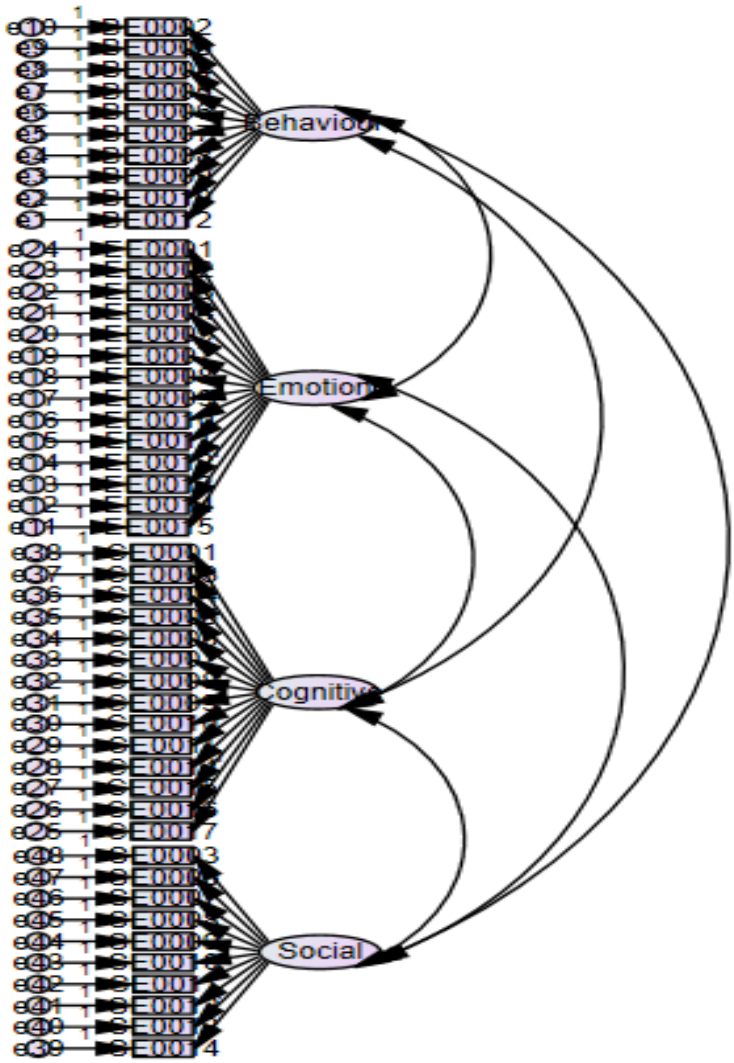

Figure 2. *The standardized path diagram of Learner Engagement*

Multiple criteria were explored to evaluate the different aspects of the goodness-of-fit model above. Ho (2006) mentions that there are three types of indices or measures to assess goodness-of-fit measures, mainly: (1) absolute fit measures, (2) incremental fit measures, and (3) parsimonious fit measures. Table 6 shows the fitness between the four-factor model and the sample data based on those three types of measures.

Table 6.

Evaluation of the goodness-of-fit measures regarding CFA

Type of fit measures	*Indices*	*Sample values*	*Criteria*	*Source of criteria*	*Evaluation outcomes*
Absolute fit measures	X^2/df	2.43	$\leq$ 3.00	Kline (2011)	Good fit
	GFI	0.73	0.0 (poor) – 1.0 (perfect)	Ho (2006)	Good fit
	RMSEA	0.07	0.05 - 0.08 (acceptable) 0.08 to 0.10 (mediocre) > 1.0 (poor)	Ho (2006)	Acceptable
Incremental fit measures	TLI	0.84	0.0 (poor) – 1.0 (perfect)	Ho (2006)	Good fit
	NFI	0.76	0.0 (poor) – 1.0 (perfect)	Ho (2006)	Good fit
	RFI	0.75	0.0 (poor) – 1.0 (perfect)	Ho (2006)	Good fit
	IFI	0.84	0.0 (poor) – 1.0 (perfect)	Ho (2006)	Good fit
	CFI	0.84	0.0 (poor) – 1.0 (perfect)	Ho (2006)	Good fit
Parsimonious fit measures	PNFI	0.72	0.05 – 0.09 (good)	Ho (2006)	Good fit
	AIC	0.05	Closer to 0.0	Ho (2006)	Good fit

Note: Chi-square (X^2)= 2609.018; df= 1074

Table 6 shows that all indices of the three kinds of goodness-of-fit measures of the four-factor model in Figure 2 are in good or acceptable fit.

The last step in CFA is to measure the reliability and validity of the model. Reliability is about the consistency of a measure. Cronbach's

alpha (α) and Composite Reliability (CR) are the two main measures of reliability. Validity is the accuracy of a measure. Convergent Validity (measures of the same constructs) and Discriminant Validity (measures of the distinct construct) are measured by Average Variant Extracted (AVE).

The reliability of the four-factor model is indicated by the Cronbach's alpha (α) and Composite Reliability (CR) of each engagement. Cronbach's Alpha internal consistency reliability coefficient value must be greater than 0.70. CR values between 0.6 and 0.7 are considered acceptable and if they are above 0.7 are considered good (Spencer, 2013). Table 7 shows the values of α and CR.

Table 7.

Reliability based on α and CR values

Dimensions of Engagement	*α*	*CR*
Behavior	0.91	0.91
Emotional	0.92	0.93
Cognitive	0.93	0.93
Social	0.92	0.93

Table 7 indicates that values of all dimensions of Learner Engagement are in the range of 0.91-0.93 which is higher than 0.70. The same values are also found in CR in which its values are 0.91 and 0.93. These CR values are above 0.70 which are considered good. Based on the values of Cronbach's alpha (α) and Composite Reliability (CR), it can be concluded that the model has good reliability.

Validity is measured by calculating the convergent and discriminant validities of the patterns of correlation among factors (Tabachnick & Fidell, 2019). Convergent validity can be calculated by inspecting the factor loading (FL). FL should be statistically higher than 0.5, but preferably higher than 0.7 (Malhotra, 2019). Another way to measure convergent validity is by examining the average variance extracted (AVE) which is recommended to have a value greater than 0.5 (Hair et al., 2009). Discriminant validity is measured by calculating the square root of the AVE which should be greater than the correlation coefficients. Appendix 1 displays the values of the validity measures

and depicts that FL values are between 0.59 – 0.86 which are statistically higher than 0.50, though some items have values lower than 0.7. AVE values also indicating convergent validity are between 0.47 – and 0.56 showing that two out of four factors or dimensions have values greater than 0.50. These values indicate that the convergent validity of this model is acceptable, even though it is not highly satisfactory. To measure the discriminant validity of the model, the values from Appendix 1 are presented in Table 8 together with the correlation coefficient among factors.

Table 8.

Discriminant validity and correlation coefficient.

	Behavioral	*Emotional*	*Cognitive*	*Social*
Behavioral	0.71			
Emotional	0.75	0.69		
Cognitive	0.75	0.84	0.69	
Social	0.67	0.77	0.79	0.75

Table 8 shows that the value in each correlation of one dimension compared to the other dimensions or factors is greater than 0.50. This means that the discriminant validity and the correlation coefficient are good (Hair et al., 2009).

DISCUSSION

OTPD Learner Engagement Survey in Appendix 1 is suitable with the multidimensional construct suggested by Fredrick et al. (2004), Chen et al. (2018), and Bowden et al. (2019) consisting of behavioral, emotional, cognitive, and social engagement.

Behavioral Dimension of Engagement

The behavioral dimension refers to 'school-related conduct, involvement in learning, attendance, and participation in school-related activities' (Fredricks et al., 2019:1). OTPD Learner Engagement Survey also contained most of the sub-dimensions of the behavioral dimensions, such as making efforts (Burch et al., 2015; Dixson, 2015; Gunuc & Kuzu, 2015), paying attention (Sun & Rueda, 2012), following

classroom norms (Gunuc & Kuzu, 2015), and academic participation (Gunuc & Kuzu, 2015). Nevertheless, the sub-dimension of asking questions proposed by Sun and Rueda (20212) did not exist.

Since the participants of this study were in-service EFL teachers in OTPD having teaching experience of 6-15 years (81.1%), they reflected positive classroom behavior as what they expected their students did in the classroom. It was indicated by three major sub-dimensions appearing in this dimension of engagement, mainly regular attendance, being on-time, and attentive listeners.

First of all, following class rules in the forms of being on-time and regular attendance indicates positive behavior engagement. Nguyen et al. (2018) argued that classroom or school norms, expectations, or rules had strong association with behavior engagement. Another study by Mandernach (2015)concluded that frequent attendance was one of the key indicators in behavioral dimension of engagement.

Next, this study found out that the participants tended to attentively listen to their teachers. It was confirmed by the participants in the interviews that during the online meetings, they preferred listening to the teachers' explanations to asking questions to the teachers due to their reluctance with other fellow participants.

Lastly, a survey conducted by Liu & Littlewood (1997) indicated that the tendency of 'listening to teachers' was the most common classroom experience in East Asian classes as the result of the students' reluctance to take more active roles in classrooms. However, a more recent study conducted by Loh & Teo (2017) argued that, despite of over-generalizing that cultural attributes were allegedly causes of Asian (particularly East Asian) students' reticence and passivity (Shao & Gao, 2016), the reasons were more situation-specific causes which referred to dissimilarities on teaching methods and the lack of sufficient foreign language proficiency. In this research context, it might be true as the inequality of education level in Indonesia.

Emotional Dimension of Engagement

This dimension of engagement covers 'students' positive and negative reactions to class and school, and relationships with teachers, peers, and school belonging or connectedness' (Fredricks et al., 2019:1). This instrument consisted of several related sub-dimensions, such as positive reactions to teachers and school staff school (Burch et al., 2015; Deng et al., 2020; Gunuc & Kuzu, 2015; Sun & Rueda, 2012), student attitudes (Burch et al. 2015; Deng et al. 2020; Gunuc & Kuzu 2015), belonging (a feeling of being important) (Gunuc & Kuzu, 2015), valuing success in the outcome (the feeling of being important) (Gunuc & Kuzu, 2015), and enjoying classroom activities (referred to as interests) (Deng et al., 2020; Dixson, 2015; Sun & Rueda, 2012). However, the sub-dimensions of willingness to do the work (Burch et al., 2015) and having negative aspects in doing tasks (referred to as cost) (Sun & Rueda, 2012) did not appear in the scale.

The sub-dimensions in this kind of engagement indicated that these in-service EFL teachers joining OTPD respected their teachers due to their dedication and professionalism when teaching them. It was also revealed that the participants had positive attitude not only towards their teachers but also towards the program and the administration staff. When these three parties did their roles well to serve the participants during the program, it became the act of showing respect that was felt by the participants and it was a crucial element of the ethics of care and sustainable improvement (Thompson, 2018). He suggested that maintaining organizational cultures and administrative systems which developed the environment through which respect for students was clearly demonstrated strengthened teacher-student relationship and influenced students' positive behaviors and academic performance.

Cognitive Dimension of Engagement

This dimension contains all the sub-dimensions. It includes 'self-regulated learning, perceived relevance of schoolwork, use of deep learning strategies, and exerting the necessary cognitive

strategies for the comprehension of complex ideas' (Fredricks et al., 2019:2). In OTPD Learner Engagement instrument, these sub-dimensions were self-regulated, flexibility in problem-solving, and a desire to go beyond the requirements (Sun & Rueda, 2012), willingness to make necessary efforts to complete tasks and applying different learning strategies (Deng et al., 2020; Dixson, 2015; Sun & Rueda, 2012), preference to a challenge and putting investment (Gunuc & Kuzu, 2015).

The constructs in cognitive engagement are also found in motivation literature, such as learning goals, valuing learning, striving for knowledge and mastery, and self-regulated learning (Fredricks et al., 2011). Motivation is the precursor factor of cognitive engagement (Chi & Wylie, 2014). The in-service EFL teachers joining OTPD in this study were highly motivated to take part in PPG as they believed that it could transform them to be professional and more competent English teachers. They would also feel ashamed to their fellow teachers in their schools if they failed in this program. This motivation eventually led them to try their best to accomplish their assignments and got good scores in exams. This study supports evidence from previous research by Yang et al. (2018) which found that cognitive engagement included students' investment in learning in order to succeed in academic responsibilities, such as tasks, quizzes, and tests.

Social Dimension of Engagement

Social dimension is the one that considers bonds of identification and belongingness between learners and their peers as well as academic staff in their learning experience (Bowden et al., 2019) and focuses on learner-instructor and learner-learner interactions (Deng et al., 2020). The instrument in Appendix 1 contained related sub-dimensions that focused on the social interactions among learners in the online setting. The sub-dimensions were interaction with other learners and posting arguments and discussions (Deng et al., 2020; Dixson, 2015), as well as collaboration (Dixson, 2015). Since the engagement scale development was measured in the online learning

context, some new items existed that made this scale unique, such as online discussion (Deng et al., 2020; Dixson, 2015), posting arguments and responses in LMS (learning management system), and feeling as if being engaged with real people (not in an online mode) (Gunuc & Kuzu, 2015).

Previous research by Gómez-Rey et al. (2016), Horzum (2015), and Peacock & Cowan (2019) argued that social presence had a strong correlation with social interaction. The more learners engaged themselves personally and emotionally with other learners, the more interactions they had with them. The difference between social presence and social interaction was distinctive. Social interaction emphasized on interactivity as a latent quality of communication that might or might not be realized by individuals whereas social presence occurred when they realized and noticed the interactivity (Cobb, 2009) In this study, the in-service EFL teachers joining OTPD preferred having interactions in the form of small group discussions with the peers they had known before or were comfortable with. It could be derived from this situation that, even though the participants knew everyone in the program, they preferred to work together with the people to whom they were personally or emotionally connected. Hence, small group discussions were formed informally without teachers' or administrators' interference. These sorts of discussions improved learning effectively as participants' created their own learning community in which they learned from and with one another via positive and collaborative online environment (Brindley et al., 2009).

CONCLUSION

Understanding the engagement of teachers as learners in an online TPD is crucial as such engagement indicates active learning as well as interaction and collaboration with other teachers (Picard & Kutsyuruba, 2017). Although online TPD has a shared goal to improve teachers' knowledge and competence in the classrooms, each program has its uniqueness in terms of purposes, participants, geographies,

online platforms, internet access, and so on. This study creates a context-specific instrument to measure the engagement of Indonesian in-service EFL teachers in online teacher professional development. The instrument is conceptualized as consisting of four key dimensions of engagement, mainly behavioral, emotional, cognitive, and social engagement. The results of explanatory and confirmatory factor analyses confirm this hypothesis.

The present study can have policy and practical implications for policymakers, universities hosting OTPD, and future research. The OTPD Learner Engagement instrument is useful for the government to identify features of online TPD contexts that facilitate behavioral, emotional, cognitive, and social engagement. Also, the instrument can be used by universities in Indonesia that conduct online TPD for in-service teachers as a diagnostic tool to provide general feedback to instructors concerning the pattern of engagement in online TPD. Future research into online TPD should focus on the LMS (learning management system) of online platforms as it provides a rich, virtual venue to investigate learners' engagement, interaction, and collaboration.

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Appendix 1. The validity values of OTPD Learner Engagement Survey and factors regarding the CFA findings.

Item	*Convergent Validity (Factor loading)*	*Convergent Validity (AVE)*	*Discriminant Validity (√AVE)*
Behavioral Engagement		0.51	0.71
B-2: I followed the rules of the online class.	0.70		
B-3: I carefully listened to my teachers in class.	0.73		
B-4: I carefully listened to other students in class.	0.72		
B-5: I attended the class willingly.	0.74		
B-6: I did my homework/tasks in time.	0.61		
B-7: I tried to do my best regarding my responsibilities in a group work.	0.74		
B-8: I made sure I studied on a regular basis	0.75		
B-9: I planned and organized my study.	0.77		
B-10: I was able to consistently pay attention when I was taking the online learning class.	0.75		
B-12: I shared information with my classmates.	0.62		
Emotional Engagement		0.47	0.69
E-1: I found the online class interesting.	0.66		
E-2: I liked my teachers.	0.70		
E-3: My teachers were competent in their field.	0.67		
E-4: The LMS administrator & other academic staff were competent in their field.	0.63		
E-5: I had teachers that I could share my problems with.	0.61		
E-7: I respected my teachers.	0.66		
E-8: I felt enthusiastic when I was in this online class.	0.71		
E-9: I strived as hard as I could to complete assignments for this online class.	0.69		

E-10: I liked communicating with my teachers dealing with the materials.	0.71		
E-11: I was proud of assignments I completed in this online class.	0.74		
E-12: My teachers respected me as an individual.	0.70		
E-13: My classmates respected my thoughts/views.	0.73		
E-14: I felt myself as a part/member of a student group.	0.71		
E-15: I felt excited by my work at the online class.	0.71		
Cognitive Engagement		0.48	0.69
C-1: I checked my work for mistakes.	0.72		
C-3: When I read the course materials, I asked myself questions to make sure I understood what it was about.	0.72		
C-4: I took good notes over readings, PowerPoints, or presentations.	0.71		
C-5: When I had trouble understanding a concept or an example, I went over it again until I understood it.	0.68		
C-6: I applied the course material to my teaching.	0.76		
C-7: If I did not know about a concept when learning in the online class, I did something to figure it out.	0.63		
C-8: I discussed what I had learned in class with my classmates out of class.	0.69		
C-9: I tried to do my homework in the best way.	0.75		
C-10: I spent enough time and made enough effort to learn.	0.68		
C-11: I studied the material from the LMS before the class and discussed it with my classmates	0.69		
C-14: I enjoyed intellectual difficulties I encountered while learning.	0.64		
C-15: I determined my own learning goals.	0.73		

C-16: I tried my best to get good grades.	0.65		
C-17: I did well on the teaching practice activities and exam	0.65		
Social Engagement		0.56	0.75
S-3: I helped fellow participants during the online class and/or via WhatsApp group.	0.59		
S-6: I often responded to other participants' questions.	0.63		
S-7: I posted in the discussion forum regularly.	0.70		
S-8: I participated actively in small-group discussion forums.	0.74		
S-9: I shared learning materials (e.g. notes, multimedia, and links) with other participants in the online class and/or via WhatsApp group.	0.78		
S-10: I helped fellow participants during the class and/or through WhatsApp group.	0.85		
S-11: I engaged in conversations online with my classmates (chat, discussions, and email).	0.86		
S-12: I felt comfortable interacting with other participants.	0.77		
S-13: I liked seeing my classmates in the online class.	0.76		
S-14: Getting to know other participants in the online class gave me a sense of belonging	0.75		