

Exploratory Factor Analysis of the Indonesian Version of Student Engagement Scale

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Abstract: Student engagement is one of the factors that influence student academic achievement. However, there is much debate about the operational definition and dimensionality of this construct. For this reason, this study intends to examine dimensionality of this construct. A total of 596 students in Indonesia participated in this study consisting of junior high school students, high school students, and undergraduate students. Data was collected online using a student engagement scale (SES), the Indonesian version of the adaptation of the SES by Reeve & Tseng, which contains 22 items. The results of this scale found that the Cronbach alpha reliability coefficient was 0.927. Content validity analysis by Forward-Backward translation by linguists and by expert judgment. Analysis of construct validity with exploratory factor analysis found that the SES version of the Indonesian language consisted of three 3 factors accounting 57.986% of total variance explained, but it also consisted 4 factors accounting 62.078% of total variance explained. So, based on these results, the Indonesian version of the student engagement scale can be applied using three or four dimensions.

1 INTRODUCTION

Adolescence is a crucial development period where adolescents experience a phase of self-identity formation, social integration, and commitment to learning (Skinner et al., 2009). In this phase, adolescents are busy with activities at school, especially in the learning process. Therefore, in this learning process, adolescents as students should be able to participate actively. Active student participation which is marked by interest, investment and student effort in school assignments and activities both inside and outside the classroom is known as student engagement (Wang & Holcombe, 2010).

Student engagement leads to the totality of students to be actively and proactively involved in learning activities in a behavioral, cognitive, and emotional manner (Fredricks & McColskey, 2012). According to Wang and Holcombe (2010) adolescents who have student engagement will be involved in their school, take the time to develop their academic potential, channel their energies to positive activities and mobilize their motivation to be actively involved in classroom and outside activities. Student engagement is also a predictor that shows the level of attention, effort, persistence, positive emotions, and

commitment of a student in the learning process (Handelsman et al., 2005).

Student engagement is important for students, because this behavior supports the learning process so that it can take place well. Klem & Connell (2004) stated, students who are engaged in learning activities, especially in class, are much more likely to have good performance than those who are not involved in these activities. Low student engagement among students is a contributing factor to low achievement, boredom, feelings of alienation, and even causes students to drop out of school (Fredricks & McColskey, 2012).

The importance of student engagement is one of the most interesting and widely researched studies today, including in Indonesia. It's just that researchers have limitations in data collection instruments. Not many studies have been found on psychometric property testing regarding student engagement measurement tools, so it is often the cause of weaknesses in research on student engagement. Based on this, the researcher is interested in conducting research on testing psychometric properties of dimensionality and reliability of the Indonesian version of the student engagement measurement tool.

Research on the psychometric properties of student

engagement has been conducted by Fredriks & McColskey (2012). In his research, it was found that student engagement is a multidimensional construct consisting of three dimensions. These dimensions are cognitive engagement, emotional engagement, and behavioral engagement. In this study, 21 items were valid and reliable for measuring student engagement. Another study conducted by Reeve & Tseng (2011) found that student engagement is a multidimensional construct consisting of four dimensions, namely cognitive engagement, emotional engagement, behavioral engagement, and agentic engagement. The results of research conducted by Veiga (Veiga, 2016) found that student engagement consists of cognitive engagement, emotional engagement, behavioral engagement, and agentic engagement. Meanwhile, research conducted by Appleton, Cristenson, Kim, & Reschly (2006) found that student engagement consists of two dimensions, namely cognitive engagement and psychological engagement.

In this study, the student engagement scale (SES) being tested is a scale adapted from the SES made by Reeve and Tseng (2011) which states that student engagement consists of four dimensions, namely: Agentic engagement (AE) is student involvement in a form that deliberately acts proactively about what will be learned and prepare for the lesson, Behavior engagement (BE) is the involvement of students in the form of concentration, attention, and effort during the learning process, Emotional engagement (EE) is student involvement in the form of interest in learning and the absence of emotional resistance (stress) on lessons, and Cognitive Engagement (CE) is the involvement of students in the form of using strategies in learning activities.

2 METHOD

This study uses a quantitative research design. The validity of the measuring instrument in this study was obtained in two ways: first, through content validity carried out through an assessment by a panel of experts and secondly through the obtained construct validity through exploratory factor analysis, namely to test the dimensional properties of the construct this student engagement. The reliability of the measuring instrument was obtained using the alpha Cronbach analysis.

A total of 596 students in Indonesia participated in this study consisting of junior high school students, high school students, and undergraduate students. Data was collected online using a student engagement scale (SES), the Indonesian version of the adaptation

of the SES by Reeve & Tseng (2011), which contains 22 items.

3 RESULTS

The student engagement scale used is an adaptation of the student engagement scale made by Reeve & Tseng (2011). The adaptation process refers to the way described by Beaton et al., (2000) in which the processes include: 1) Translating the original language measuring instrument into Indonesian. In this case the researcher translates with the help of a licensed translator and another translator who is proficient in psychology. 2) Synthesis of translation. The two translations from the translators were synthesized. 3) Backward transaction. In this case the researcher is assisted by a translator who speaks Indonesian and is a native speaker of the original language. 4) Final translation assessment by expert judgment.

From the results of data analysis with the Cronbach Alpha test, the reliability coefficient value was 0.927. Then to find out the factors / dimensions that make up SES, it is done by using the EFA test, by first doing an assumption test analysis with KMO and Bartlett's test. The assumption test results obtained a KMO value of 0.939 (>0.05) and a Bartlett Test of 7000,823 ($p=0.000$), so it can be concluded that the assumption test is fulfilled so that it can be continued to factor analysis. The results were analyzed by means of the analysis of exploratory factor analysis (EFA). The results of this analysis indicated that there were 3 factors that had eigenvalues above 1, these three factors were able to explain 57,986% of the total variance of SES. The results of loading factors from the EFA can be seen in the following table:

Table 1: SES loading factor results with 3 factors.

No Item	Factors		
	1	2	3
i1	.188	.265	.670
i2	.106	.065	.827
i3	.145	.099	.842
i4	.318	.213	.650
i5	.235	.106	.748
i6	.170	.801	.110
i7	.206	.759	.136
i8	.252	.796	.102
i9	.410	.697	.124
I10	.135	.548	.128
i11	.445	.616	.186

i12	.372	.610	.174
i13	.535	.603	.185
i14	.325	.329	.285
i15	.720	.292	.185
i16	.716	.240	.146
i17	.747	.199	.235
i18	.635	.196	.273
i19	.636	.174	.257
i20	.614	.313	.027
i21	.694	.237	.161
i22	.599	.284	.168

Based on the table, it is found that the SES measurement tool forms 3 factors, namely agentic engagement, behavioral & emotional engagement, and cognitive engagement. However, this result is different from the theory proposed by Reeve & Tseng (2011) which states that SES consists of 4 factors, so the researcher performs the EFA test again by bringing up 4 factors. The results of this analysis show that the SES which consists of 4 factors is able to explain 62.078% of the total variance of SES. However, the results of the eigenvalues of three factors have a value above 1 and one factor has a value of 0.900. The results of loading factors from this analysis can be seen in the following table:

Table 2: SES loading factor results with 4 factors.

No item	Factors			
	1	2	3	4
i1	.190	.247	.667	.108
i2	.108	.052	.825	.069
i3	.146	.083	.839	.085
i4	.342	.224	.661	-.061
i5	.229	.079	.741	.146
i6	.185	.795	.115	.099
i7	.210	.737	.134	.178
i8	.269	.791	.108	.085
i9	.424	.686	.127	.099
i10	.194	.611	.162	-.307
i11	.429	.565	.170	.312
i12	.341	.539	.149	.426
i13	.513	.541	.165	.367
i14	.239	.189	.226	.787
i15	.725	.274	.183	.088
i16	.729	.234	.150	.017
i17	.759	.192	.238	.019
i18	.642	.183	.272	.056
i19	.627	.140	.247	.170
i20	.618	.296	.025	.089
i21	.691	.209	.154	.141
i22	.596	.257	.162	.144

Based on the table, it is found that SES forms 4 factors with items 1-5 forming the AE factor, items 6-10 forming the BE factor, items 11-14 forming the EE factor, and items 15-22 forming the CE factor, so these results are in accordance with the theory submitted by Reeve & Tseng (2011).

4 DISCUSSION

The results of this study found that the SES reliability value was 0.927. The results of the EFA test show that the Indonesian version of SES is formed by 3 factors which explain the SES of 57,986%. Then it could also form 4 factors that could explain the SES of 62.078%.

In this study the Indonesian version of SES was adapted from SES made by Reeve & Tseng (2011) which states that SES consists of 4 factors, if we refer to the EFA results where 3 factors have an eigenvalue value above 1 then one more factor has an eigenvalue of 0.900. So that we can conclude that there is a possibility that the Indonesian version of SES is a multi-dimensional measuring tool that can be used as 3 factors. Research conducted by Fredricks & McColskey (2012) states that student engagement is a multidimensional construct consisting of 3 factors.

The Indonesian version of SES can also be used as 4 factors according to the basic theory. Research conducted by Veiga (2016) on students in Portugal also found that SES consists of 4 factors, namely agentic engagement, behavioral engagement, emotional engagement, and cognitive engagement.

Based on the results of the study, the Indonesian version of SES allows it to be used by using 3 or 4 factors. However, for even stronger proof, the researcher suggests conducting tests using confirmatory factor analysis to test the theoretical model whether the Indonesian version of SES is fit with a 3-factor or 4-factor model.

5 CONCLUSIONS

The results showed that the Indonesian version of SES has a reliability coefficient of 0.927. The EFA results show that SES consists of 3 factors that can explain 57,986% of SES, and form 4 factors that can explain SES of 62.078%. So based on these results it is possible that SES can be used with 3 factors or 4 factors. However, for further research, the researcher suggests conducting a confirmatory factor analysis test to ensure the correct theoretical model to explain the theoretical construct of SES.

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