

DEVELOPING INSTRUMENTS OF STUDENT ENGAGEMENT AND SELF REGULATED LEARNING IN ONLINE TUTORIAL

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Abstract

The purpose of the study was to analyse validity and reliability of the instruments that measured students' engagement in online tutorial and self-regulated learning. The population of the study were students from 11 undergraduate study programs who attended online tutorial at the Faculty of Teacher Training and Education at Universitas Terbuka in Indonesia. The sample was randomly selected from students who registered in 5 courses of semester 2020/2021.2, for each study program. Data were collected using questionnaires that were presented in online format and distributed to students via their email address. The number of respondents who filled out the questionnaire was 261 students. The data were analysed to determine the values of validity and reliability instruments of students' engagement in online tutorial and self-regulated learning and to explain the relationship between the two variables. The results of the study indicated that the instruments are valid and reliable, in addition there is a relationship between variables students' engagement in online tutorial and self-regulated learning. The conclusion is that the two instruments can be used for further studies.

Keywords: online tutorial, distance learning, student engagement, self-regulated learning.

1 INTRODUCTION

To ensure the success of student learning, lecturers should analyze and conduct studies on the characteristics and behaviors of students learning. Characteristics that students should have in participating in online learning include independent or self-regulated learning, motivation, and computer literacy (Dent & Koenka, 2016; Wandler & Imbriale, 2017). Self-regulated learning refers to a model regarding student characteristics in planning and monitoring learning activities and building self-regulated learning is a challenge in the online learning environment (Pintrich, 1990; Wandler & Imbriale, 2017; Zimmerman, 2000, 2002).

Self regulated learning is very important because it supports the development of lifelong learning skills. These skills include setting specific goals for oneself, how to adopt strategies to achieve goals, selectively monitoring performance, managing physical and social contexts, managing time efficiently, linking things that happen to goals, and adapting innovative methods (Zimmerman, 2000, 2002). Self-regulated learning involves three aspects, namely how students cognitively process learning material, metacognitive strategies, and determination (Bilde et al. 2011; Winne 1995).

Vytasek, Patzak, & Winne (2020) show that there are three main themes regarding student engagement in learning, namely perceptions of active involvement in learning, how active involvement relates to the learning process, and student relations in learning and academic

performance. Student engagement has a relationship with emotional, behavioral, cognitive, success, learning outcomes and other student academic performance (Kuh, Cruce, Shoup, & Kinzie, 2008; Kahu, Stephens, Zepke, & Leach, 2014; Krause and Coates, 2008; Martin & Bolliger, 2018). The involvement of these students in online learning is very important to support learning success, improve academic performance, reduce feelings of isolation, and solutions to dropout problems (Martin & Bolliger, 2018).

Student engagement is the key to successful teaching and learning. Therefore education providers and teachers always try to provide learning environments and online learning strategies so that students' active involvement in online learning can increase (eg Khan, Egbue, Palkie, & Madden, 2017; Zhu, Zhang, Au, & Yates, 2020).

Strategies for student involvement in learning need to be carried out by providing a variety of positive active learning experiences through the provision of counseling, tutoring, writing centers, learning communities, and other active learning experience support services. Farrell & Brunton (2020) shows that students' active involvement in successful online learning appears to be influenced by psychosocial factors such as peer community, tutors or lecturers, self-confidence, and structural factors such as life load and course design. Advances in technology in learning enable the use of these technologies to identify and analyze students' active involvement in learning through reports on learning analytics.

Previous studies have shown that student engagement in learning supports learning success and learning outcomes (Bowden, Tickle & Naumann, 2021; Kahu, Stephens, Zepke, & Leach, 2014; Phan, McNeil, & Robin, 2016; Paulsen & McCormick, 2020) and related to student satisfaction (Lu, 2020). The success of students in learning is supported by various aspects, including a student-centered learning environment, interactions between students and instructors and interactions between students, characteristics and use of media, course design, innovative techniques and methods, task clarity, fast and relevant feedback (Poll and Weller, 2014).

Referring to background that have been mentioned, it is deemed necessary to conduct research on (1) developing valid and reliable instruments to measure student engagement and self-regulated learning in online learning and (2) identifying the relationship between student engagement and self-regulation learning in tutorials. Research formulations that can be raised are (1) Are the instruments that measure student engagement and student self-regulated learning valid and reliable? (2) Is student self-regulated learning predict student engagement in online learning?

2 METHODOLOGY

The study has been carried out using methods of development of measurement instruments and correlational research. Once the dimensions and indicators of the two instruments are agreed upon by the research team, then the team developed items of the indicators of the two instruments and was followed by conducting discussions and revising the instruments.

The study was conducted to the students of undergraduate program in the Faculty of Education and Teacher Training, who register in the semester of 2020/21.2. This study carried on May – June 2021. The population was students who took online tutorials in 11 undergraduate programs at the Faculty of Education and Teacher Training. The sample were students who took 5 courses randomly selected from the 11 study programs. The number of respondents who sent the questionnaire was 1921 students. However, the number of students who responded to the instrument was 261 students.

Self-regulated learning Instrument modified the self-regulated learning instrument used in the research of Rahayu, Widodo, & Redjeki, S (2017), The instrument refers to the Motivated Strategies for Learning Questionnaire (MSLQ) from Pintrich (2004) and Zimmerman (2002). The dimensions of the instrument consisted of a motivation dimension with indicators of intrinsic motivation, extrinsic motivation, and self-efficacy, as well as learning strategy dimensions with indicators of academic and scientific goals, self-monitoring, learning source and environment managing, time management strategy, self-regulating, and reflection. The student engagement instrument modifies the instrument from Dixson (2010, 2015) which the dimensions consisted of skills, emotional, participation, and performance. Both of these instruments were in the form of an online questionnaires and was sent to the elected students via their e-mail address.

The team of the research team conducted an analysis of the instruments to evaluate the validity and reliability of the instruments. Factor analysis technique was carried out in order xected to analysis instruments validity. Moreover, Cronbach's alpha analysis was executed in order to test reliability. In addition, regression analysis was used in order to identify whether student self-regulated learning could predict student engagement in online learning.

3 FINDINGS AND DISCUSSION

The Research Team consulted about learning in the distance education system to two experts. The results of the consultation found that the learning experience in online tutorials would involve teaching presence, social presence, cognitive presence (Garrison, Anderson, Archer, 2000). The teaching presence refers to the process structure of the learning experience.

Furthermore, the results of the consultation also concluded that there are types of interactions that can occur in online learning (Anderson, 2004). Interactions in online tutorials can occur between lecturers and content, lecturers and students, and students with content. In addition, there are also interactions that occur among lecturers, among content, and among students. Furthermore, it can also be conveyed that the interaction between teaching presence and social presence is referred to as climate setting; between teaching presence and cognitive presence is called selecting content; between cognitive presence and social presence is called supporting discourse; and between teaching presence and social presence and cognitive presence is called educational experience.

3.1 Instruments of Students Engagement in Online Tutorial and Self-Regulated Learning

3.1.1 *Students Engagement in Online Tutorial and Self-Regulated Learning: Instrument Validity*

The KMO and Bartlett's Test scores of the two instruments of student engagement and self-regulated learning were more than 0.60, which means that factor analysis could be carried out (shown in Table 1) (Shrestha, 2021; Taherdoost et al., 2020). Furthermore, the results of the factor analysis of the two instruments showed that the indicators of these instruments have met the requirements. These results were supported by (1) communalities scores of items of the two instruments were more than 0.45 (Table 2 and Table 3), and the percentage of the total variance of the instruments for student engagement was explained by 62% (Table 4), and for self-regulated learning was explained by 64% (Table 6). Data were analysed by extraction method principal component analysis and rotation method: varimax with Kaiser Normalization. In this analysis there has been a converged rotation in 8 iterations for student engagement instrument and 17 iterations for self-regulated learning instrument (item construct of the instrument as shown in Table 5 and Table 7).

The dimension of self-regulated learning instrument consisted of indicators of intrinsic motivation, extrinsic motivation, and self-efficacy, academic and scientific goals, self-monitoring, learning

source and environment managing, time management strategy, self-regulating, and reflection (Pintrich, 2004; Zimmerman. 2002; Rahayu, Widodo, & Redjeki, 2017).

The dimensions of the instrument for student engagement instrument are indicators of skills, emotional, participation, and performance (Dixson, 2010, 2015). In online learning, student engagement in the learning process is also an important aspect because the aspect is related to various student academic performances. There are 4 components of student engagement in learning, namely academic, social, cognitive and affective components (Finn & Zimmer, 2012). Zhu, Zhang, Au, & Yates (2020) further argued that sustained student engagement in online learning is significantly predicted by four self-regulation factors (intrinsic orientation, performance orientation, self-management, and metacognitive awareness) and attitudes, which are mediated through interaction online social experience felt by students.

Table 1. KMO and Bartlett's Test of the Two Instruments

Instrument of Student Engagement			Instrument of Self-Regulated Learning		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.949		Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.922	
Bartlett's Test of Sphericity	Approx. Chi-Square	5566.998	Bartlett's Test of Sphericity	Approx. Chi-Square	6066.771
	df	435		df	666
	Sig.	.000		Sig.	.000

Table 2. Communalities of Student Engagement Instrument

Item	Extraction	Item	Extraction	Item	Extraction
SE01	0.507	SE11	0.624	SE21	0.679
SE02	0.566	SE12	0.699	SE22	0.587
SE03	0.527	SE13	0.495	SE23	0.663
SE04	0.637	SE14	0.689	SE24	0.622
SE05	0.64	SE15	0.788	SE25	0.568
SE06	0.607	SE16	0.79	SE26	0.57
SE07	0.651	SE17	0.585	SE27	0.673
SE08	0.676	SE18	0.551	SE28	0.588
SE09	0.504	SE19	0.594	SE29	0.675
SE10	0.722	SE20	0.584	SE30	0.597

Table 3. Communalities of Self-Regulated Learning Instrument

Item	Extraction	Item	Extraction	Item	Extraction
A01	0.562	B06	0.557	B18	0.603
A02	0.628	B07	0.669	B19	0.626
A03	0.689	B08	0.557	B20	0.709
A04	0.688	B09	0.751	B21	0.668
A05	0.665	B10	0.737	B22	0.553
A06	0.677	B11	0.696	B23	0.552
A07	0.507	B12	0.572	B24	0.717
B01	0.702	B13	0.607	C01	0.742
B02	0.694	B14	0.578	C02	0.735
B03	0.643	B15	0.595	C03	0.727
B04	0.498	B16	0.598	C04	0.753
B05	0.613	B17	0.594	C05	0.729
				C06	0.501

Table 4. Total Variance Explained of Student Engagement Instrument

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	14.288	47.626	47.626	14.288	47.626	47.626	5.753	19.178	19.178
2	1.784	5.947	53.574	1.784	5.947	53.574	4.739	15.797	34.975
3	1.49	4.967	58.541	1.49	4.967	58.541	4.721	15.375	50.71
4	1.097	3.656	62.197	1.097	3.656	62.197	3.446	11.487	62.197

Table 5. Rotated Component Matrix of Student Engagement Instrument

Item	Component				Item	Component			
	1	2	3	4		1	2	3	4
SE01			0.571		SE16		0.777		
SE02	0.402		0.612		SE17		0.641		
SE03	0.608				SE18	0.614			
SE04			0.703		SE19		0.5		0.472
SE05			0.628		SE20	0.577			0.409
SE06			0.559	0.462	SE21	0.739			
SE07			0.511	0.489	SE22	0.595			
SE08			0.759		SE23	0.683			
SE09	0.602				SE24	0.584	0.413		
SE10				0.718	SE25	0.504			
SE11				0.598	SE26	0.56			
SE12				0.691	SE27		0.708		
SE13	0.436		0.438		SE28	0.679			

Item	Component		Item	Component
SE14	0.421	0.682	SE29	0.697
SE15	0.881		SE30	0.559

Table 6. Total Variance Explained of Self-Regulated Learning Instrument

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
	1	13.723	37.089	37.089	13.723	37.089	37.089	4.881	13.192
2	2.81	7.594	44.683	2.81	7.594	44.683	3.868	10.454	23.647
3	1.938	5.238	49.921	1.938	5.238	49.921	3.696	9.988	33.634
4	1.586	4.286	54.207	1.586	4.286	54.207	3.511	9.49	43.125
5	1.365	3.689	57.896	1.365	3.689	57.896	3.724	8.849	51.974
6	1.173	3.17	61.066	1.173	3.17	61.066	3.05	8.244	60.218
7	1.097	2.964	64.03	1.097	2.964	64.03	1.41	3.811	64.03

Table 7. Rotated Component Matrix of Self-Regulated Learning Instrument

Item	Component							Item	Component						
	1	2	3	4	5	6	7		1	2	3	4	5	6	7
A01				0.672				B13	0.512						
A02							0.712	B14	0.564						
A03				0.68				B15	0.475						
A04				0.703				B16				0.66			
A05			0.569	0.459				B17				0.465		0.45	
A06				0.648				B18						0.68	
A07				0.569				B19					0.574		
B01				0.705				B20					0.64		
B02				0.705				B21					0.587		
B03				0.644				B22						0.628	
B04				0.55				B23					0.472		
B05	0.497			0.5				B24							0.785
B06				0.526				C01							0.798
B07	0.546				0.436			C02		0.714					
B08	0.648							C03		0.717					
B09	0.759							C04		0.784					
B10	0.72							C05		0.79					
B11	0.69							C06		0.483					
B12	0.476														

3.1.2 Students Engagement in Online Tutorial and Self-Regulated Learning : Instrument Reliability

The instruments of student engagement and self-regulated learning are reliable. The Cronbach's alpha score from the student engagement instrument in online tutorials was 0.961, while the Cronbach's alpha score from the self-regulated learning instrument was 0.945 (Table 8). Furthermore, the correlation of the items from the two instruments to the total score of each instrument is shown by the scores in Table 9 and Table 10.

Table 8. Reliabilities Statistics of the Two Instruments

Instrument of Student Engagement		Instrument of Self-Regulated Learning	
Cronbach's Alpha	N of Items	Cronbach's Alpha	N of Items
.961	30	.945	37

Table 9. Item Total Statistics of Student Engagement Instrument

Item	Corrected Item-Total Correlation	Item	Corrected Item-Total Correlation	Item	Corrected Item-Total Correlation
SE01	.614	SE11	.687	SE21	.687
SE02	.611	SE12	.671	SE22	.700
SE03	.631	SE13	.648	SE23	.660
SE04	.624	SE14	.672	SE24	.726
SE05	.693	SE15	.686	SE25	.709
SE06	.636	SE16	.749	SE26	.701
SE07	.693	SE17	.650	SE27	.667
SE08	.619	SE18	.643	SE28	.591
SE09	.534	SE19	.666	SE29	.638
SE10	.678	SE20	.677	SE30	.697

Table 10. Item Total Statistics of Self-Regulated Learning Instrument

Item	Corrected Item-Total Correlation	Item	Corrected Item-Total Correlation	Item	Corrected Item-Total Correlation
A01	.455	B06	.585	B18	.352
A02	.291	B07	.649	B19	.549
A03	.565	B08	.565	B20	.596
A04	.545	B09	.654	B21	.677
A05	.570	B10	.641	B22	.312
A06	.555	B11	.644	B23	.590
A07	.508	B12	.685	B24	.475
B01	.635	B13	.675	C01	.499
B02	.615	B14	.642	C02	.642

Item	Corrected Item-Total Correlation	Item	Corrected Item-Total Correlation	Item	Corrected Item-Total Correlation
B03	.519	B15	.646	C03	.637
B04	.501	B16	.550	C04	.611
B05	.650	B17	.535	C05	.581
				C06	.579

3.1.3 Relationships between Students Engagement in Online Tutorial and Self-Regulated Learning

The results of the analysis show that there is a significant relationship between student engagement and self-regulation learning. The results of the analysis are shown in Table 11. Self-regulated learning seems to be able to predict student engagement by 58,7 % (Table 12), while 41,3 % could be influenced by other factors which were not examined in this study. The calculation of Anova for the regression analysis is shown in Table 13. The results of the study are in line with those that was proposed by Vytasek, Patzak, & Winne (2020), that actively student engagement related to cognitive, emotional, and motivational aspects, as well as to goals and learning adaptation.

Table 11. Correlation Between Self-Regulating Learning and Student Engagement

		Student Engagement	Self-Regulating Learnng
Pearson Correlation	Student Engagement	1.000	0.587
	Self-Regulating Learnng	0.587	1.000
Sig (1 tailed)	Student Engagement		0.000
	Self-Regulating Learnng	0.000	
N	Student Engagement	273	273
	Self-Regulating Learnng	273	273

Table 12. Analysis Regression: Model Summary

Model	R	R Square	Adjusted R Square	Std Error of the Estimate
1	0.587	0.345	0.342	12.09

Table 12. Analysis Regression: Anova

Model		Sum of Squares	df	Mean Squares	F	Sig
1	Regression	20839.103	1	20839.103	142.561	0.000
	Residual	39614.026	271	146.177		
	Total	60453.128	272			

4 CONCLUSION

From the studies that have been done it seems that (1) the indicators of the variables in student engagement in the tutorial refer to the dimensions of skills, emotional, participation, and performance, (2) the indicators of the variables in self-regulated learning include the dimensions of motivation, self-concept, goals, monitoring, managing time and resources, as well as evaluation and self-reaction.

The conclusions of this study are (1) the instruments of student engagement in tutorials and self-regulated learning appear to be valid and reliable, and (2) there is a relationship between self-regulated learning and student active involvement with learning outcomes in online tutorials. Both of these instruments can be used for further research. Recommendations for improvement are the need to continue research by reassuring the validity and reliability of the two instruments.

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