



Upper Class Elementary School Student Engagement in Math Subject Merdeka Curricula: Post Covid Study Case in Jakarta Province Indonesia

Riana Bagaskorowati^{1*} 

¹ Faculty of Science Education, Universitas Negeri Jakarta, Jakarta, Indonesia

ARTICLE INFO

Article history:

Received December 22, 2022

Accepted February 14, 2023

Available online February 25, 2023

Kata Kunci:

Keterlibatan Perilaku, Keterlibatan Motivasional, Keterlibatan Kognitif, Keterlibatan Sosial

Keywords:

Behavioral Engagement, Motivational Engagement, Cognitive Engagement, Social Engagement



This is an open access article under the [CC BY-SA](https://creativecommons.org/licenses/by-sa/4.0/) license.

Copyright © 2023 by Author. Published by Universitas Pendidikan Ganesha.

ABSTRAK

Kurikulum Merdeka merupakan kurikulum paradigma baru yang diluncurkan pada tahun 2020 oleh Menteri Pendidikan Republik Indonesia. Tujuan penelitian adalah untuk mengukur siswa kelas atas dalam mata pelajaran matematika pasca-covid 19 di Provinsi Jakarta, Indonesia. Penelitian ini memeriksa empat dimensi instrumen keterlibatan siswa (SEI) dan divalidasi menggunakan analisis faktor konfirmatori/CFA melalui model persamaan struktural (SEM). Jenis penelitian ini yaitu kuantitatif. Metode kuantitatif yang digunakan adalah proporsional sampling dengan jumlah 503 sampel dan tersebar di 5 (lima) wilayah. Metode pengumpulan data menggunakan survey. Instrumen yang digunakan dalam mengumpulkan data yaitu kuesioner. Teknik analisis data menggunakan analisis deskriptif kualitatif dan kuantitatif. Hasil penelitian yaitu Validitas prediktif hasil pada empat dimensi keterlibatan siswa diberikan dengan 0,709 untuk CE (keterlibatan kognitif), 0,837 untuk BE (behavioral engagement), 0,640 untuk EE (keterlibatan emosional), 0,412 untuk SE (keterlibatan sosial). Kami memperkirakan cronbach's alpha sebagai reliabilitas keterlibatan siswa (SEI) secara keseluruhan pada empat dimensi SE dengan tinggi sedang pada 0,74 untuk CE (keterlibatan kognitif), 0,82 untuk BE (behavioral engagement), 0,89 untuk EE (keterlibatan emosional), 0,73 untuk SE (keterlibatan sosial). Manfaat student engagement berguna bagi guru sekolah untuk mengukur keefektifan kegiatan belajar siswa, hubungan guru-siswa akan semakin hangat dan mendalam.

ABSTRACT

The Merdeka Curriculum is a new paradigm curriculum launched in 2020 by the Minister of Education of the Republic of Indonesia. The study aimed to measure post-covid 19 high school students in mathematics in Jakarta Province, Indonesia. This study examined the four dimensions of the student engagement instrument (SEI) and was validated using confirmatory factor analysis/CFA through a structural equation model (SEM). This type of research is quantitative. The quantitative method used is proportional sampling, with 503 samples spread over 5 (five) regions. The data collection method uses a survey. The instrument used in collecting data is a questionnaire. Data analysis techniques using qualitative and quantitative descriptive analysis. The study's results, namely the predictive validity of the results on the four dimensions of student engagement, were assigned a score of 0.709 for CE (cognitive engagement), 0.837 for BE (behavioral engagement), 0.640 for EE (emotional involvement), 0.412 for SE (social engagement). We estimated Cronbach's alpha as the overall reliability of student engagement (SEI) on the four SE dimensions with moderate height at 0.74 for CE (cognitive engagement), 0.82 for BE (behavioral engagement), .89 for EE (emotional involvement), 0.73 for SE (social engagement). The benefits of student engagement are helpful for school teachers to measure the effectiveness of student learning activities, and the teacher-student relationship will be warmer and more profound.

1. INTRODUCTION

Student engagement until this time is relatively hot topic in education. Basically concept of student engagement explains about the deep involvement of students in learning activities both inside and outside the classroom eventually effect in learning outcome (Bergdahl et al., 2020; Florence Martin & Bolliger, 2018; Yu et al., 2020). This concept does not merely explain the interest or motivation to learn but more than that students involve themselves psychologically to learn various things that exist in education effectively and practically (Poondej & Lerdpornkulrat, 2016; Zambak & Magiera, 2018). Student engagement contributes proactively in learning activities (D'Mello et al., 2017; Reinhard Pekrun et al., 2012). By previous researchers student engagement has been stated includes 3 (three) dimensions of engagement consist of behavioral engagement, emotional engagement and cognitive engagement (Afzal & Crawford, 2022; Lu'mu

*Corresponding author.

E-mail addresses: riana.bagaskorowati@unj.ac.id (Riana Bagaskorowati)

et al., 2023). While research through descriptive statistics method in middle-school (high school) and high-school (high school) schools was there are 4 (four) student engagement that can affected student academic performance in the field mathematics and science that include dimensions of students engagement such as cognitive engagement, behavioral engagement, emotional engagement and social engagement (M.-T. Wang et al., 2016). Students who have high engagement will show sincerity in learning and trying to get many things. Including knowledge, attitudes and skills (Maroco et al., 2016; M.-T. Wang et al., 2016).

The term cognitive engagement or cognitive dimension itself is concerned with self-regulation in learning that use sharper and cognitive strategies needed to understand complex ideas in terms of solving learning problems (Earl et al., 2023; Lawson et al., 2023). The dimensions of student engagement in cognitive strategies are measured using items about the use of appropriate and in-depth learning strategies aimed at students about how they should learn and understand the material content of the lessons given by the teacher then self-regulation strategies and perseverance in learning (Z. Liu et al., 2023; C. Wang et al., 2022). While the emotional engagement is conceptualized as a positive reaction to teachers, peers, and class activities and appreciates learning and has an interest in learning content. For the measurement of emotional engagement in student engagement measured by items such as students' interest or interest in the subjects they take, they are happy with the subjects and they have seriousness in following the lessons they are taking (S. Liu et al., 2022; Yang et al., 2022). For the behavioral engagement dimension or the behavioral dimension in student engagement is defined as involvement in class-based academic activities, the presence of positive behavior and the absence of other disturbing behaviors (Fredricks et al., 2016; Lawson et al., 2023). Studies conducted by previous researchers for the behavioral engagement dimension were measured by several items such as attention to the lesson (attention), active participation in learning activities (active participation), concentration on subjects being given by the teacher in class (concentration), can completing homework completion (homework completion), and obedience to the rules when following learning in the classroom (Fredricks et al., 2016).

In addition to the three main dimensions of student engagement is social engagement. What is meant by the social dimension is interaction with peers and adults, as well as the desire to maintain relationships while learning inside and outside the classroom (Konc et al., 2021; Poerwati & Cahaya, 2018; M.-T. Wang et al., 2016). Almost all concepts from the existing literature regarding dimensions or components of student engagement are influenced by how much student interaction with learning activities and between components of the dimensions of student involvement are interdependent with each other (Hofmann & Müller, 2021; Mamas et al., 2019).

The dimension of Student engagement is not just the involvement or participation of students in learning but it involves something more than that, namely responsibility and deep feelings towards students in learning activities (Miller et al., 2020; Yu et al., 2020). Learning activities without involving deep feelings and responsibilities on students will not get meaningful results because they are merely involving students which should have an impact on the educational dimensions of both the knowledge, attitudes and skills gained from the process of teaching and learning activities in schools (M.-T. Wang et al., 2016). Previous researcher, stated involvement of students and teachers interactively between time, effort and other relevance related to psychological investment sources that exist in students and educational institutions or schools in order are to achieve learning outcomes that are optimistic from the learning experience of students to improve the performance of the ability of students and schools or educational institutions (Brown et al., 2015; Dewi et al., 2018).

Besides aiming to adapt, this research also develops instruments on student engagement at the level of primary education on elementary school and middle school level simultaneously. The adaptation and development of SEI was tested with the validity and reliability of student engagement that had been done previously to ensure that the instrument has the feasibility to be used in research and generally using SEM. In this study the instrument test was conducted in the Indonesian version which was conducted on elementary and junior high school students. The adaptation and development of SEI does not merely translate the measurement tool, but also adjusts whether the test is contextual with the socio-cultural conditions of the destination community, therefore it needs to be adjusted and developed in the context of Indonesia or the destination community. Adaptation includes activities from determining whether measuring devices can measure the same constructs in different languages and cultures to check their equivalence in adapted forms (Hambleton et al., 2005). At this stage the study was conducted by adapting the four dimensions of student engagement (e.g. cognitive engagement, behavioral engagement, emotional engagement and social engagement) among elementary and junior high school students in DKI Jakarta province. The measurement of student engagement at this point with subject focus on math students on elementary level grade 5th - 6th and junior high school grade 7th - 9th.

2. METHOD

This type of research is descriptive quantitative. Sample size of this study are 503 students. By using random sampling of each district of 100 samples of students, we choose upper elementary school grade 6th and junior high school grade 7th - 9th spread in five districts of DKI Jakarta province, Indonesia. The total number of students was 64.8% (326 girls students) and 35.2% (177 boys students). The following procedures performed by researchers in the adaptation and development of SEI consist of stage 1 to stage 3. First, stage 1. by translating the original test (in English language) into the target language (in Bahasa) (Fredricks et al., 2016; M.-T. Wang et al., 2016). Translating language into statement items is not the same as translating sentence by sentence, let alone word by word. Translation is not just changing the language used, but also the context adapted to the culture. Then the synthesis is made from the original language into Indonesian then the similarities and differences are sought until finally an agreed translation is obtained. Do a translation back to the original language and then the results of the back translation are then compared with the original scale, is there a difference in meaning of the results on the translation.

Second, stage 2. Doing a try out by provide SEI consist of questionnaire to math subject in small quantities. A trial to a small number of subjects was carried out to find out whether the instructions and items in the scale were understood by respondents or not. If qualitatively the items in the test can be understood, then a validity and reliability test will be conducted with a larger sample size. Each 40 statement items of questionnaire filled by the students for one subject area of Mathematics. All SEI statement items are filled by students using a Likert scale 1 - 5 (e.g. Strongly Disagree, Neutral, Agree, Strongly Agree). Third, stage 3. Documented and collect all of tests result and instrument that had been adapted and translate from english language to bahasa. Thus the use of tests for cross-cultural studies can be maximized.

Using random sampling for boys and girls students with maximum samples are 100 students each district. We describe each school to use questionnaire student engagement instrument which has been adopted from Veiga et al (2012) for tree dimension of student engagement (e.g. cognitive, behavior and emotional/affective) and Ming-T-Wang for social engagement. Previously the questionnaire already been translated into Indonesian language according to the context of the meaning and original statement to be easily understood by students. The Likert scale of 1-5 were used to be filled by the students. Each school was visited first and we explain the purpose of conducting survey on student involvement or willingness to achieve academic performance through a Student Engagement Instrument survey that was adapted from English to Indonesian. It is necessary to ensure that items or items from statements on the questionnaire that had been adapted were matched or not the students. The following procedures performed by researchers in the Adaptation and Development of SEI consist of stage 1 to stage 3.

To test predictive validity, multiple regression analysis was carried out in structural equation modeling (SEM) to investigate the extent to which four dimensions of student engagement can predict mathematical values. Data that has been collected empirically will be analyzed using the AMOS Ver 6.0.0. The factor structure of student engagement were evaluated with confirmatory factor analysis (CFA) for math. The approaches method using first order confirmatory factor analysis/CFA. As a measure of overall fit of a model as a whole is considered good if the value of small squares with a significant level of $p > 0.05$. Whereas RMSEA (Root Mean Square Error of Approximation), which shows the estimated error (error approximation) is that which can be tolerated to indicate whether or not a model is fit. The RMSEA index is a perfect if equal or same to 0.0. While the value that can be used to accept or not a model is ≤ 0.08 (Ferdinand, 2000; Ghozali, 2008). While CMIN / DF is an indication of whether or not a model is accepted if it is less than 2.0 or less than 3.0. One other important step is the process in analysis using structural equations (SEM) is to ensure the model is in an over-identified condition with a *df* (degree of freedom) value positive or greater than 1. The formula for *df* are $= 1/2 [p \cdot (P + 1) - k]$ where *p* = number of manifest / indicator variables and *k* = number of parameters estimate.

3. RESULT AND DISCUSSION

Result

Cognitive engagement indicators that are measured are as follows. First, understand the material better by relating it to already known things. Second, students find out how the information can be helpful in the real world. Third, students try to express ideas in their own words when learning new information. Fourth, students try to connect what they learn with experience. Fifth, students create examples to help them understand essential concepts. Sixth, students often try to associate it with what I learned in other classes about the same thing. Seventh, students try to relate what I learned in other classes about the same or similar things. The eight students tried to see the similarities and differences between the things they

learned. The results of item descriptive statistics with averages and standard deviations regarding cognitive engagement are presented in [Table 1](#).

Table 1. Results of Descriptive Statistics Regarding Cognitive Engagement

Dimension of Student Engagement Instrument	SE - Report (n = 503)	
	M	SD
Cognitive Engagement		
1. When I study, I try to understand the material better by relating it to things I already know.	4.33	0.91
2. When I study, I figure out how the information might be useful in the real world.	3.81	1.32
3. When learning new information, I try to put the ideas in my own words.	4.37	0.94
4. When I study, I try to connect what I am learning with my own experiences.	4.23	1.06
5. I make up my own examples to help me understand the important concepts I learn from school.	4.20	1.11
6. When learning things for school, I often try to associate them with what I learn in other classes about the same or similar things.	4.31	1.05
7. When learning things for school, I often try to associate what with what I learn in other classes about the same or similar things.	3.95	1.12
8. I try to see the similarities and differences between things I am learning for school and things I know already.	3.92	1.19
9. I try to understand how the things I learn in school fit together with each other.	4.41	0.90
	4.27	0.93
10. I try to match what I already know with things I am trying to learn for school.	4.28	1.05
11. I try to think through topics and decide what I'm supposed to learn from them, rather than studying topics by just reading them over.	4.18	0.97
12. When studying, I try to combine different pieces of information from course material in new ways.		

Second, the indicators for the dimensions of student engagement instruments are as follows. First, students try to excel in school. Second, in class, students work as hard as they can. Third, students participate in class activities. Fourth, students pay attention in class. Fifth, students act like they are working. Sixth, students do anything to survive. Seventh, students' minds wander. Eighth, when students have difficulty understanding a problem, students will learn to understand. The nine students worked on the assignment to completion. The results of item descriptive statistics with the average and standard deviation regarding student engagement are presented in [Table 2](#).

Table 2. Results of Descriptive Statistics Regarding Engagement Behavior

Dimension of Student Engagement Instrument	SE - Report (n = 503)	
	M	SD
Behavior Engagement		
1. I try to do well in school.	3.80	1.25
2. In class, I work as hard as I can.	3.90	1.23
3. When I'm in class, I participate in class activities.	4.36	0.80
4. I pay attention in class.	4.02	1.14
5. When I'm in class, I just act like I'm working.	4.26	1.01
6. In school, I do just enough to get by.	4.15	0.83
7. When I'm in class, my mind wanders	3.75	1.30
8. If I have trouble understanding a problem, I go over it again until I understand it.	4.11	1.16
9. When I run into a difficult homework problem. I keep working at it until I think I have solved it.	4.02	1.04
10. I am an active participant of school activities such as sport day and school picnic.	3.94	1.15
11. I volunteer to help with school activities such as sport day and parent day.	4.22	0.95
12. I take an active role in extra-curricular activities in my school.	4.18	0.90

Third, the indicators of Emotional/Affective Involvement are as follows. First, students are very interested in learning. Second, students find learning interesting. Third, students like what they learn at school. Fourth, students like to learn new things in class. Fifth, students think learning is boring. Sixth, students like school. The results of item descriptive statistics with averages and standard deviations regarding Emotional/Affective Engagement are presented in Table 3.

Table 3. Results of Descriptive Statistics Regarding Emotional/Affective Engagement

Dimension of Student Engagement Instrument Emotional/Affective Engagement	SE - Report (n = 503)	
	M	SD
1. I'm very interested in learning	3.84	1.19
2. I think what we are learning in school is interesting	4.06	1.19
3. I like what I'm learning in school	3.99	1.01
4. I enjoy learning new things in class	4.24	0.91
5. I think learning is boring	3.84	1.26
6. I like my school	4.34	0.86
7. I'm proud to be at this school	4.11	1.12
8. Most mornings, I look forward to going to school	3.98	1.01
9. I am happy to be at this school	3.77	1.23

Fourth, the Social Engagement dimension indicators are as follows. First, students build on other people's ideas. Second, students try to understand other people's ideas in math class. Third, students try to work with others who can help them with math. Fourth, students try to help others who have difficulty in mathematics. Fifth, students do not care about other people's ideas. Sixth, students do not share ideas when working with others. Seventh students prefer to avoid working with classmates. The results of item descriptive statistics with mean and standard deviation regarding Social Engagement are presented in Table 4.

Table 4. Results of Descriptive Statistics Regarding Social Engagement

Dimension of Student Engagement Instrument Social Engagement	SE - Report (n = 503)	
	M	SD
1. I build on others' idea	4.21	0.97
2. I try to understand other people's ideas in math class.	4.00	1.19
3. I try to work with others who can help me in math.	4.24	0.95
4. I try to help others who are struggling in math.	4.15	0.83
5. I don't care about people's ideas	3.76	1.30
6. When working with others. I don't share ideas.	4.10	1.16
7. I don't like working with classmates.	4.01	1.05

Using structural equation modeling with Amos version 6.0.0, the result of dimensionality test of four dimension of student engagement are provided below on figure 1. From the results of statistical analysis using the structural equation model as shown in figure 5. The result was provided degree of freedom (df) = 2. While the value of GFI = 0.997; CFI = 0.997; RMSEA = 0.040; $p = 0.163$ ($p \geq .05$). The evaluation of fit model of criteria in the First CFA and the estimation results of the modified model regression weights are Chi-Square (X^2) = 3.627. Probability (p) = $0.163 \geq 0.05$. CMIN/DF = $1.813 \leq 2.0$. RMSEA = $0.040 \leq 0.08$. Estimation Result of modification model of regression weight showed in Table 5.

Table 5. Estimation Result of modification model of regression weight

	Estimate	S.E	CR	P
CE <-----Student Engagement	1.000			
BE <-----Student Engagement	1.352		0.104	13.037
EE <-----Student Engagement	0.812		0.067	12.184
SE <-----Student Engagement	0.468		0.058	8.188

Predictive validity at four dimensions of student engagement are provided with 0.709 for CE (cognitive engagement); 0.837 for BE (behavioral engagement); 0.640 for EE (emotional engagement); and

0.412 for SE (social engagement). We estimated cronbach's alpha as reliability of student engagement (SEI) of the overall on four dimension SE with was high moderate at 0.74 for CE (cognitive engagement); 0.82 for BE (behavioral engagement); 0.89 for EE (emotional engagement); and 0.73 for SE (social engagement).

Discussion

Student engagement is a multidimensional construct that consists of four components of engagement such as cognitive, behavioral, emotional and social dimensions (Bergdahl et al., 2020; Yu et al., 2020). At this stage the researchers conducted a structural test with the first order confirmatory factor analysis model. The validity test results using structural equations with the first order confirmatory factor analysis model found that the degree of freedom is 2 (positive). While over all fit confidence refers to table 2 and table 3 about evaluating the criteria for goodness of fit, researchers get the results of fit. For the three dimensions of student engagement cognitive engagement, behavioral engagement and emotional engagement researchers adapted the student engagement instrument items. Whereas the social dimension of adaptation refers to researchers see that there are bias answers to questions on several items of engagement statements that are answered on a Likert scale for 5th and 6th grade students (upper elementary level) at the time of data collection (Florence Martin & Bolliger, 2018; Wang et al., 2016).

For regression weight and Critical Ratio (CR) were provided a significant regression weight coefficient on the four dimensions of student engagement. Analyzed from the result are essentially that involvement of students in school psychologically including dimensions of cognitive, emotional and behavioral and social involvement in the learning process, academic and social activities both in class or outside the classroom in order to achieve good learning outcomes are very important things (Martin & Bolliger, 2018; Susanti, 2020). Student involvement is a psychological dimension related to students' sense of ownership of the school, acceptance of school values and behavioral components related to participation in school activities (Guo et al., 2020; Lidiawati & Helsa, 2021; Ubu et al., 2021).

This student involvement is an embodiment of the motivation seen through the actions, cognitive, and emotional as well as socially displayed by students. The involvement of students in schools is very important with regard to the attention, interest, and effort that students mobilize in order to participate in learning activities so that they will be successful in achieving learning outcomes (Cinches et al., 2017; Westman & Bergmark, 2018). We not only test student involvement in school as a multidimensional construct in addition to three components namely the behavioral, cognitive and emotional components but also social engagement (Florence Martin & Bolliger, 2018; Wang et al., 2016).

From the results of the validity and reliability test on the cognitive dimension (Cognitive engagement), were obtained positive results with mean range ($M = 3.81 - 4.27$) and ($SD = .91 - 1.32$) referring to the quality of cognitive processes and student learning strategies for school assignments. Among the factors on the dimensions of cognitive engagement that pierce on that are the willingness and perseverance to learn, self-regulation and learning challenges (Butler & Winne, 1995; Wolters, 2004). This component also includes motivation to learn and use cognitive and metacognitive strategies in thinking and learning (Fredricks et al., 2016; Guo et al., 2020). Cognitive engagement is the involvement of students with the learning process of students in the class which ultimately shows that students are present not only physically but also their thoughts include attention, concentration, focus, participation and have a willingness to try to exceed the standards owned (Müller et al., 2021; Velaora et al., 2022). Finally this dimension looks at how students' efforts are needed in understanding and mastering a material then students achieve these abilities.

The next component is emotional student involvement which refers to a sense of ownership in schools, interests, perceptions of learning values, positive and negative reactions to teachers, friends and school activities (Cosso et al., 2022; Poerwati & Cahaya, 2018). Emotional engagement describes students' positive emotions in the learning process and assignments given. This dimension is considered very important to foster a student's sense of attachment to his school and influence students' willingness to learn (Djamahar et al., 2020; Lim et al., 2021). We obtain positive results with mean range ($M = 3.84 - 4.34$) and standard deviation ($SD = 0.86 - 1.19$). The construct of student involvement in schools develops in a variety of varied theoretical traditions, some experts explain the involvement of students in schools to see the relationship between contextual factors, patterns of involvement and adjustments in student involvement, other researchers explain the role of student involvement in school in the dynamics of students who drop out of school (X. L. Wang et al., 2016).

Self-determinant theory and stage-environment fit explain that individuals look for experiences to meet their fundamental needs and identities through interactions with the environment, so that student involvement in school is strongly influenced by the context of the student's environment, if the surrounding environment is able to meet the psychological needs of students, then students will be more interested in actively participating in school activities, on the contrary if the environment fails to meet the psychological

needs of students it will cause a decrease in academic motivation and student interest which in turn contributes to decreased student involvement (Florence Martin & Bolliger, 2018; Wang et al., 2016). Expectancy-value theory explains that school failure to meet adolescent psychological needs leads to decreased academic motivation and interest, which in turn contributes to decreased school involvement and poor academic performance during the transition of adolescents to secondary schools (Purpura & Schmitt, 2019; Yu et al., 2020). The student involvement results from intrinsic motivation or individual needs that make students have positive feelings and continue their practice with perseverance and self-confidence. Motivation is the energy and impetus for students to learn in school, while the involvement of students in school is a reflection of that encouragement (Taştan et al., 2018; Zaccoletti et al., 2020). While the social component is concerned with the involvement of students and students such as mutual assistance between school friends and teachers helping students in efforts to improve student learning success at school.

It is important to provide interpretation of result and findings of this study in terms of the following limitations such as first, his study relied exclusively on survey methods. Second, the integration of multiple methods, such as interviews, experience sampling methods, and observations to assess engagement could prove valuable in its ability to holistically explore the construct. Third, the studies should obtain a larger sample in the future with wide range samples on greater number of students on private school and public school to provide a good validity of result of survey and estimated student engagement report. of teachers to rate a greater number of students. Fourth, allowing a multilevel factorial structure to be conducted, thereby addressing potential clustering effects. Our study positively contributes to this objective by providing empirical evidence supporting the psychometric properties of the Math Engagement Scales. We anticipate this measure will be of interest to scholars investigating the contextual predictors and academic consequences of math engagement. We also anticipate this measure will be useful for teachers interested in identifying student at-risk for math disengagement.

4. CONCLUSION

The results of this research analysis show that the psychological involvement of students in school includes cognitive, emotional, and behavioral dimensions and social involvement in the learning process, overall on the four SE dimensions with moderate height. It was concluded that the predictive validity of the results on the four dimensions of student involvement, namely CE (cognitive engagement), BE (behavioral engagement), EE (emotional involvement), and SE (social involvement), obtained positive results.

5. ACKNOWLEDGE

This study was supported by School of Postgraduate Studies of Universitas Negeri Jakarta, Indonesia with grant number 31/UN39.5/PKP/PS-UNJ/V/2019 and no conflict of interest.

6. REFERENCES

- Afzal, F., & Crawford, L. (2022). Student's perception of engagement in online project management education and its impact on performance: The mediating role of self-motivation. *Project Leadership and Society*, 3. <https://doi.org/10.1016/j.plas.2022.100057>.
- Bergdahl, N., Nouri, J., & Fors, U. (2020). Disengagement, engagement and digital skills in technology-enhanced learning. *Education and Information Technologies*, 25(2), 957-983. <https://doi.org/10.1007/s10639-019-09998-w>.
- Brown, G. T. L., Chaudhry, H., & Dhamija, R. (2015). The impact of an assessment policy upon teachers' self-reported assessment beliefs and practices: A quasi-experimental study of Indian teachers in private schools. *International Journal of Educational Research*, 71(1), 50-64. <https://doi.org/10.1016/j.ijer.2015.03.001>.
- Butler, D. L., & Winne, P. H. (1995). Feedback and Self-Regulated Learning: A Theoretical Synthesis. *Review of Educational Research*, 65(3), 245. <https://doi.org/10.2307/1170684>.
- Cinches, M. F. C., Russell, R. L. V., Chavez, J. C., & Ortiz, R. O. (2017). Student engagement: Defining teacher effectiveness and teacher engagement. *Journal of Institutional Research in South East Asia*, 15(1).
- Cosso, J., de Vivo, A. R. R., Hein, S., Silvera, L. P. R., Ramirez-Varela, L., & Ponguta, L. A. (2022). Impact of a Social-emotional Skills-Building Program (Pisotón) on Early Development of Children in Colombia: A Pilot Effectiveness Study. *International Journal of Educational Research*, 111, 101898. <https://doi.org/10.1016/j.ijer.2021.101898>.
- D'Mello, S., Dieterle, E., & Duckworth, A. (2017). D'Mello et al., (2016). Advanced, Analytic, Automated (AAA)

- Measurement of Engagement During Learning. *Link article*
<http://dx.doi.org/10.1080/00461520.2017.1281747>. *Educ Psychol*, 5(2).
<https://doi.org/10.1080/00461520.2017.1281747>.
- Dewi, N. R., Kannapiran, S., & Wibowo, S. W. A. (2018). Development of digital storytelling-based science teaching materials to improve students' metacognitive ability. *Jurnal Pendidikan IPA Indonesia*, 7(1), 16–24. <https://doi.org/10.15294/jpii.v7i1.12718>.
- Djamahar, Dewahrani, & Octaviani. (2020). Relationship Between Self-Esteem And Negative Emotional State With Academic Procrastination In Final Level Students. *Indonesia Journal of Biology Education*, 3(1). <https://doi.org/http://dx.doi.org/10.31002/ijobe.v3i1.2290>.
- Earl, S. R., Taylor, I. M., Meijen, C., & Passfield, L. (2023). Trajectories in cognitive engagement, fatigue, and school achievement: The role of young adolescents' psychological need satisfaction. *Learning and Individual Differences*, 101. <https://doi.org/10.1016/j.lindif.2022.102248>.
- Fredricks, J. A., Blumenfeld, P. C., & Blumenfeld, P. C. (2016). School Engagement: Potential of the Concept, State of the Evidence. *Review of Educational Research*. <https://doi.org/10.3102/00346543074001059>.
- Guo, P., Saab, N., Post, L. S., & Admiraal, W. (2020). A review of project-based learning in higher education: Student outcomes and measures. *International Journal of Educational Research*, 102(November 2019), 101586. <https://doi.org/10.1016/j.ijer.2020.101586>.
- Hambleton, R. ., Merenda, P. F., & Spielberger, C. D. (2005). *Adapting Educational and Psychological Tests for Cross-Cultural Assessment*. Lawrence Erlbaum Associates.
- Hofmann, V., & Müller, C. M. (2021). Language skills and social contact among students with intellectual disabilities in special needs schools. *Learning, Culture and Social Interaction*, 30. <https://doi.org/10.1016/j.lcsi.2021.100534>.
- Konc, T., Savin, I., & Bergh, J. C. J. M. van den. (2021). The social multiplier of environmental policy: Application to carbon taxation. *Journal of Environmental Economics and Management*, 105. <https://doi.org/10.1016/j.jeem.2020.102396>.
- Lawson, M. J., Deur, P. Van, Scott, W., & Stephenson, H. (2023). The levels of cognitive engagement of lesson tasks designed by teacher education students and their use of knowledge of self-regulated learning in explanations for task design. *Teaching and Teacher Education*, 125. <https://doi.org/10.1016/j.tate.2023.104043>.
- Lidiawati, K. R., & Helsa. (2021). Online Learning during Covid-19 Pandemic: How Self- Regulated Learning Strategies Impact Student Engagement? *Jurnal Psibernetika*, 14(1). <https://doi.org/10.30813/psibernetika.v14i1.2570>.
- Lim, P. K., Koay, K. Y., & Chong, W. Y. (2021). The effects of abusive supervision, emotional exhaustion and organizational commitment on cyberloafing: a moderated-mediation examination. *Internet Research*, 31(2), 497–518. <https://doi.org/10.1108/INTR-03-2020-0165>.
- Liu, S., Liu, S., Liu, Z., & Peng, X. (2022). Automated detection of emotional and cognitive engagement in MOOC discussions to predict learning achievement. *Computers & Education*, 181. <https://doi.org/10.1016/j.compedu.2022.104461>.
- Liu, Z., Kong, W., Peng, X., & Yang, Z. (2023). Dual-feature-embeddings-based semi-supervised learning for cognitive engagement classification in online course discussions. *Knowledge-Based Systems*, 259. <https://doi.org/10.1016/j.knosys.2022.110053>.
- Lu'mu, Cahyadi, A., Ramli, M., Ruslan, & Hendryadi. (2023). Perceived related humor in the classroom, student–teacher relationship quality, and engagement: Individual differences in sense of humor among students. *Heliyon*, 9(1). <https://doi.org/10.1016/j.heliyon.2023.e13035>.
- Mamas, C., Daly, A. J., & Schaelli, G. H. (2019). Socially responsive classrooms for students with special educational needs and disabilities. *Learning, Culture and Social Interaction*, 23. <https://doi.org/10.1016/j.lcsi.2019.100334>.
- Maroco, J., Maroco, A. L., J.A.D. C., & Fredricks, J. . (2016). University student's engagement: development of the University Student Engagement Inventory (USEI). *Psicologia: Reflexão e Crítica*, 21. <https://doi.org/10.1186/s41155-016-0042-8>.
- Martin, F., & Bolliger, D. (2018). Engagement matters: Student perceptions on the importance of engagement strategies in the online learning environment. *Online Learning Journal*, 22(1). <https://doi.org/10.24059/olj.v22i1.1092>.
- Martin, Florence, & Bolliger, D. U. (2018). Engagement matters: Student perceptions on the importance of engagement strategies in the online learning environment. *Online Learning Journal*, 22(1), 205–222. <https://doi.org/10.24059/olj.v22i1.1092>.
- Miller, K. K., St Jorre, T. J. de, West, J. M., & Johnson, E. D. (2020). The potential of digital credentials to engage students with capabilities of importance to scholars and citizens. *Active Learning in Higher*

- Education*, 21(1), 11–22. <https://doi.org/10.1177/1469787417742021>.
- Müller, A. M., Goh, C., Lim, L. Z., & Gao, X. (2021). COVID-19 Emergency eLearning and Beyond: Experiences and Perspectives of University Educators. *Education Sciences*, 11(1), 19. <https://doi.org/10.3390/educsci11010019>.
- Poerwati, C. E., & Cahaya, I. M. E. (2018). Project-Based Drawing Activities in Improving Social-Emotional Skills of Early Childhood. *Jurnal Obsesi: Journal of Early Childhood Education*, 2(2). <https://doi.org/10.31004/obsesi.v2i2.114>.
- Poondej, C., & Lerdpornkulrat, T. (2016). The development of gamified learning activities to increase student engagement in learning. *Australian Educational Computing*, 31(2).
- Purpura, D. J., & Schmitt, S. A. (2019). Cross-domain development of early academic and cognitive skills. *Early Childhood Research Quarterly*, 46, 1–4. <https://doi.org/10.1016/j.ecresq.2018.10.009>.
- Reinhard Pekrun, Linnenbrink-Garcia, & Lisa. (2012). *Academic Emotions and Student Engagement*. https://doi.org/10.1007/978-1-4614-2018-7_12.
- Susanti, Y. (2020). Student Engagement in EFL On-Line Class. *Lingual Journal of Language and Culture*, 10(2). <https://doi.org/10.24843/LJLC.2020.v10.i02.p02>.
- Taştan, S. B., Davoudi, S. M. M., Masalimova, A. R., Bersanov, A. S., Kurbanov, R. A., Boiarchuk, A. V., & Pavlushin, A. A. (2018). The impacts of teacher's efficacy and motivation on student's academic achievement in science education among secondary and high school students. *Eurasia Journal of Mathematics, Science and Technology Education*, 14(6), 2353–2366. <https://doi.org/10.29333/ejmste/89579>.
- Ubu, A. C. P., Putra, I. N. A. J., & Santosa, M. H. (2021). EFL University Student Engagement On The Use Of Online Discussion In North Bali. *Language and Education Journal Undiksha*, 4(1). <https://doi.org/10.23887/leju.v4i1.29938>.
- Velaora, C., Dimos, I., Tsagiopoulou, S., & Kakarountas, A. (2022). A Game-Based Learning Approach in Digital Design Course to Enhance Students' Competency. *Information (Switzerland)*, 13(4), 1–25. <https://doi.org/10.3390/info13040177>.
- Wang, C., Chen, J., & Xie, P. (2022). Observation or interaction? Impact mechanisms of gig platform monitoring on gig workers' cognitive work engagement. *International Journal of Information Management*, 67. <https://doi.org/10.1016/j.ijinfomgt.2022.102548>.
- Wang, M.-T., Fredricks, J. A., Ye, F., Hofkens, T. L., & Linn, J. S. (2016). The Math and Science Engagement Scales: Scale Development, validation, and psychometric properties. *Journal of Learning and Instruction*, 43. <https://doi.org/10.1016/j.learninstruc.2016.01.08>.
- Wang, X. L., Eberhard, D., Voron, M., & Bernas, R. (2016). Helping students with cognitive disabilities improve social writing skills through email modeling and scaffolding. *Educational Studies*, 42(3), 252–268. <https://doi.org/10.1080/03055698.2016.1160825>.
- Westman, S., & Bergmark, U. (2018). Re-considering the onto epistemology of student engagement in higher education. *Educational Philosophy and Theory*, 51(8). <https://doi.org/10.1080/00131857.2018.1454309>.
- Wolters, C. A. (2004). Advancing achievement goal theory: Using goal structures and goal orientations to predict students' motivation, cognition, and achievement. *Journal of Educational Psychology*, 96(2), 236–250. <https://doi.org/10.1037/0022-0663.96.2.236>.
- Yang, S., Shu, D., & Yin, H. (2022). The bright side of dark emotions: Exploring EFL teachers' emotions, emotional capital, and engagement in curriculum implementation. *Teaching and Teacher Education*, 117. <https://doi.org/10.1016/j.tate.2022.103811>.
- Yu, Z., Gao, M., & Wang, L. (2020). The Effect of Educational Games on Learning Outcomes, Student Motivation, Engagement and Satisfaction. *Journal of Educational Computing Research*, 59(3), 522–546. <https://doi.org/10.1177/0735633120969214>.
- Zaccoletti, S., Camacho, A., Correia, N., Aguiar, C., Mason, L., Alves, R. A., & Daniel, J. R. (2020). Parents' Perceptions of Student Academic Motivation during the COVID-19 Lockdown: A Cross-Country Comparison. *Frontiers in Psychology*, 11, 3602. <https://doi.org/10.3389/FPSYG.2020.592670/BIBTEX>.
- Zambak, V. S., & Magiera, M. T. (2018). Pre-service K-8 teachers' professional noticing and strategy evaluation skills: An exploratory study. *Eurasia Journal of Mathematics, Science and Technology Education*, 14(11). <https://doi.org/10.29333/ejmste/92021>.