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THE EFFECTIVENESS OF STUDY, EXPLORE, IMPLEMENT, EVALUATE E-LEARNING MODEL BASED ON PROJECT-BASED LEARNING ON THE STUDENTS CONCEPTUAL UNDERSTANDING AND LEARNING AGILITY

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Abstract

The results of online learning were not optimal, as evidenced by the unsatisfactory learning outcomes. These issues influenced students who had a poor understanding of concepts and those who were quick to learn. It was the reason for the study that aims to analyze the effectiveness of study, explore, implement, evaluate (SEIE) model e-learning based on project-based learning (PjBL) on the conceptual understanding and agility of students. The research design is a posttest control group design, which is a quasi-experimental design. The sample size for this study is 58 students, including 28 in the experimental group and 30 in the control group. The study used test and questionnaire methods to collect research data. A questionnaire instrument that included 30 statements was used to evaluate their learning agility, and a test instrument in the form of 10 essay questions was utilized to evaluate their conceptual understanding. As data analysis techniques, quantitative descriptive analysis and inferential statistical analysis utilizing MANOVA were applied. The findings revealed that the SEIE model e-learning based on PjBL was beneficial in improving students' ability to understand concepts and their agility as learners, both partially and simultaneously. This condition was indicated by the value of sig. < 0.05. As a result, the SEIE model e-learning based on PjBL was effective on students' ability to understand concepts and their agility, both partially and simultaneously. Thus, this model became a learning recommendation for improving conceptual understanding and agility.

Keywords – Agile learner, concept understanding, problem-based learning

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1. Introduction

Learning was still experiencing a dilemma, as the government had to adopt measures that were appropriate for the current situation, which was exacerbated by the ongoing Covid-19 pandemic. Covid-19 had been going for about two years, and all learning had to be done online. Because online learning did not need students and teachers meeting in person, this type of learning was chosen. Students would be able to learn more freely due to online learning, as there would be no time or space constraints (Hwang,

Wang & Lai, 2020; Kkese, 2020; Lage-Cal, Folgueras-Díaz, Alonso-Hidalgo, García-Menéndez & Fernández-García, 2020). Not only was online learning used in elementary, junior high, and high school education levels, but it was also practiced at universities with platforms such as E-learning, Zoom, Google Meet, and other communication tools. Google Meet, Google Room, Google Classroom, WhatsApp, and social media were used for online learning (Chang, Hong, Paganelli, Phantumvanit, Chang, Shieh et al., 2020). The existing learning process, the learning assessment, and the evaluation process would be significantly impacted by online learning. One of the courses offered at the Primary Teacher Education Study Program at Ganesha University of Education (Undiksha) was assessment and evaluation. This course aims to educate students with information and abilities related to the general assessment and evaluation process as well as assessment and evaluation in elementary schools. This course was designed with the understanding that the evaluation and learning processes were inextricably linked. Students were expected to be able to utilize assessment and evaluation in teaching practice after learning the assessment and evaluation courses. Students had to understand the concept of assessment to master and have the ability to develop, create, and carry out the assessment and evaluation process.

Concept understanding refers to a person's capacity to master a variety of subjects by not just memorizing but also explaining them in various ways (Fitrah, 2017). The capacity to integrate new concepts with previous knowledge and experience is the fundamental process for meaningful learning, and meaningful learning refers to one's ability to understand concepts (Farrokhnia, Pijeira-Díaz, Noroozi & Hatami, 2019). In the learning process, concept understanding is tightly linked to working memory (Rhodes, Booth, Palmer, Blythe, Delibegovic & Wheate, 2016). The description also shows how understanding concepts play a significant part in the problem-solving process, with understanding concepts being one of the conditions, as well as the capacity to link concepts and mental readiness in the learning process (Nomleni & Manu, 2018), as well as a thorough understanding of the concept is an absolute requirement in achieving learning success (Widyantari, Ayub & Ardhuha, 2020). As a result, a meaningful learning process may be accomplished if there is a strong understanding of the concept of a person. Meaningful learning will give experience and help to improve a person's social-emotional behavior, which may be applied later in life (Bressington, Wong, Lam & Chien, 2018; Kostiainen, Ukskoski, Ruohotie-Lyhty, Kauppinen, Kainulainen & Mäkinen, 2018). In a meaningful learning process, one of the capacities that are also needed is the ability of agile learners.

Agile learning is the capacity to learn from past experiences and then apply that information to new situations to achieve success (De Meuse, Dai & Hallenbeck, 2010). Agility refers to the ability to cope with problems by being flexible and agile in recognizing existing solutions (Jatmika & Puspitasari, 2019). People with high agility will use what they have learned in new settings, and they'll seek out challenges and engage in self-reflection. (Batcheller, 2016; De Meuse et al., 2010) and someone who is an agile learner will be able to effectively lead others (Velsor & Wright, 2012). There are four dimensions of learning agility: 1) People agility: the degree to which a person understands himself, learns from experience, treats others constructively, and is adaptable to change; 2) Results in agility: the degree to which a person achieves results amid adversity, inspires others, and instills confidence in others simply by being there.; 3) Mental agility: the ability to think about a subject from a different perspective and to cope with ambiguity, complexity, and the need to explain one's reasoning to others. 4) Change agility: the degree to which people are interested in new ideas, have a strong desire to learn new skills and participate in skill development activities (Jatmika & Puspitasari, 2019). The presence of activities that involve students with difficulties they confront in their everyday lives through problem solving activities is heavily driven by the existence of agile learner development in the educational process (Longmuß & Höhne, 2017). Based on this description, it could be concluded that both conceptual understanding and being an agile learner were critical skills to acquire and that the learning strategy to be implemented was the one that allowed students to participate actively in the learning process.

The conditions that occurred, however, were far from what was expected; according to the results of the problem analysis undertaken, 70% of the students just did assignments and did not wish to develop the material being studied. According to the findings of the study, 75% of the students who

participated in online learning simply followed the learning process without any desire to participate actively, as evidenced by the students' learning outcomes of approximately B-. Apart from this finding, it could not be stated to be good in terms of engagement in the learning process because many students who were asked to participate did not answer questions in the Zoom/Google Meet learning process. It supports the claim that online learning has a drawback, especially the lack of social connection among students (Dong, Cao, & Li, 2020). Many children avoid online learning in favor of activities such as playing video games, using social media, watching more YouTube videos, and doing other activities that show gadget addiction (Liu, Huang & Zhou, 2020; Rahmawati & Latifah, 2020; Samaha & Hawi, 2016). This situation would undoubtedly influence students' capacity to apply their basic knowledge and become agile learners, which would have an impact on their ability to accomplish the work. What influenced learning outcomes and quality would result in students who were unable to apply what they had learned in the classroom.

To solve this challenge, students would need to learn about the best solution that could be employed in the current situation, as well as learning that allowed them to improve conceptual understanding skills and agile learner abilities. The innovative learning model could be used to develop the capacity to grasp concepts and the ability of agile learners. The SEIE e-learning model was one of the methods that might be employed. E-learning is an asynchronous learning activity in which students acquire learning resources that meet their needs via computer electronic devices (Amjad, Hijazein, Hadadin, Jarkas, Al-Tamimi, Amarin et al., 2021; Elyas, 2018; Hamonangan, 2012). E-learning is a fascinatingly new way of learning that is flexible, student-centered, interactive, and, of course, accessible at any time, from anywhere, by anybody (Sari, Sukardi, Tasrif & Ambiyar, 2020). The availability of e-learning establishes an agreement for teachers to manage, prepare, deliver, and assess the teaching and learning process (Amin, Yousaf, Walia & Bashir, 2021). E-learning enables teachers to offer students access to scientific references linked to their courses (Budi & Nurjayanti, 2013), making it easier for interaction to occur between students and the material or subject matter (Muharto, Hasan & Ambarita, 2019). Students' academic achievement will be influenced by the learning process with E-learning (Tawafak, Romli, Arshah & Malik, 2019). The SEIE model is one of the E-learning models that is employed. The study, explore, implement, and evaluate is the acronym for the SEIE model (Astawan, Widiana & Arafik, 2021; Ayu, Manik & Simamora, 2020). "Formulating learning outcomes, mapping and organizing learning resources, selecting and determining synchronous and asynchronous learning activities, creating asynchronous learning activities, and designing synchronous learning activities" are the five primary steps in the SEIE model (Chaeruman, 2019). Because it defined a systematic and logical work procedure and included distinct and connected components that would be employed in online learning, the SEIE model was used.

Several studies on E-learning have been conducted in the past, including the one that claims that e-learning is more successful than face-to-face learning in acquiring theoretical knowledge (Gaudin, Tanguy, Plagne, Saussac, Hansmann, Jaulhac et al., 2021). According to a study, e-learning can increase students' learning performance as measured by learning outcomes achievement (Nácher, Badenes-Ribera, Torrijos, Ballesteros & Cebadera, 2021). Another study states that the addition of e-learning modules will make students more engaged with the content and more actively involved in independent learning (Logan, Johnson & Worsham, 2021). Another study also states that the SEIE e-learning model is very good and effective (Astawan et al., 2021). Online learning utilizing Undiksha's E-Learning in the Physical Education, Health, and Recreation study program was beneficial during the covid-19 pandemic (Satyawan, Wahjoedi & Swadesi, 2021). There is a link between learning results and satisfaction with e-learning in the learning process (Kim & Park, 2021). Based on this description, it could be concluded that e-learning is one of the most effective methods for learning during a pandemic, both at the school level and at the university level. Therefore, a study on e-learning would be conducted; however, what differentiates this study from others was the SEIE E-learning model that would be integrated with project-based learning (PjBL).

Because the project-based learning (PjBL) model had a positive impact on the learning process, this learning model was chosen to be incorporated in this study (Rati & Rediani, 2021), wherein the learning

process with this model, students would play an active role in the learning process (Rati, Kusmaryatni & Rediani, 2017). It is because PjBL presents students with real-life challenges that they must solve to learn (Hernáiz-Pérez, Álvarez-Hornos, Badia, Giménez, Robles, Ruano et al., 2021), where the resulting solution is in the form of a project (Chu, Zhang, Chen, Chan, Lee, Zou et al., 2017). Students would get accustomed to developing higher-order thinking skills (HOTS) through problem-based and project-based learning. PjBL is a good way to improve their thinking skills (Sasson, Yehuda & Malkinson, 2018). Several studies on PjBL have been published, including the one that claims that online PjBL is successful in the learning process, as evidenced by clear feedback on what is being done and the occurrence of positive relationships between students and teachers (Beneroso & Robinson, 2022). According to a study, students' understanding of the fundamentals of chemical engineering improved, and they gained leadership, problem-solving, communication, and time management skills (Hazwan, Bilad, Noh & Sufianb, 2021). Another study found that the PjBL model was beneficial in improving students' problem-solving and critical-thinking abilities while studying fundamental statistics (Susanto, Susanta & Rusdi, 2020). PjBL planning, implementation, and assessment had a major impact on the development of student soft skills (Dogara, Saud, Kamin & Nordin, 2020; Parmiti, Rediani, Antara & Jayadiningrat, 2021). Based on these descriptions, the project-based learning model appears to have a favorable impact on higher-order thinking skills.

This study aims to examine the effectiveness of the SEIE e-learning model based on Project-based learning (PjBL) on the ability to understand concepts and agility based on the descriptions connected to e-learning and the PjBL model. This study differs from previous studies in that it concentrated on the learning process, namely the combination of e-learning and PjBL, as well as the ability to understand concepts and agility. This learning model had been frequently utilized on its own, however, it was rarely employed in conjunction with other variables. This learning model placed a greater emphasis on higher-order thinking skills. As a result, the focus of this study was on understanding ability, as good concept understanding abilities influenced higher-order thinking skills. Moreover, if new learning methods and learning that engaged students were applied, students' knowledge of subjects would improve or grow effectively. According to the previous description, e-learning and PjBL were student-centered learning methods that allowed students to study autonomously and actively to gain experiences that they might apply later in their life. This study was believed to increase the capacity of understanding concepts and agility as a result of learning model implementation.

2. Research Method

In this study, a posttest control group design was used as a kind of quasi-experimental research (Rogers & Revesz, 2019). The experimental and control classes were used to categorize the study implementation process. The experimental group was given the SEIE model e-learning based on PjBL. The SEIE model was used to carry out the project-based learning method without e-learning for the control group. A post-test was administered to both the experimental and control groups to examine whether there was a difference in their ability to understand concepts and be agile learners. The data obtained in this study were (1) the ability to understand concepts (Y1) of students who were taught using the SEIE model e-learning based on PjBL; (2) the ability to understand concepts (Y1) of students who were taught without the SEIE model e-learning based on PjBL; (3) agile students (Y2) who were taught with the SEIE model e-learning based on PjBL; and (4) agile students (Y2) who were taught without the SEIE model e-learning based on PjBL. The trial was carried out in the Primary Teacher Education Study Program at Undiksha by involving the third-semester students which received assessment and learning evaluation courses. The total number of third-semester students was 300 people who were divided into 10 classes from class A-J. An equivalency test was carried out using One Way-ANOVA analysis using the SPSS 26.0 for Windows program before choosing the two classes. The next stage was to conduct random sampling, which revealed that class IIIB was the experimental group with a total of 28 people and class IIIC was the control group with a total of 30 people. Based on the results of the equivalence test, it was discovered that all classes had the same ability related to assessment and evaluation of learning.

Tests and questionnaires are used to collecting data in this study. In the assessment and evaluation of learning, tests are used to assess students' understanding of concepts. The designed test is ten essay questions. The ten questions are at level C2-C3. Table 1 presents indicators of understanding of the concepts contained in the learning assessment and evaluation materials. The developed instrument then has several tests, namely validity and reliability tests. The Content Validity Ratio (CVR) formula is used to test the validity of the instrument. Based on the provisions of the validation of each instrument item in the CVR formula, the CVR result from the calculation of each item is 1.00 and the total CVR of all instrument items in the conceptual understanding ability test is 10.00 so that it is declared valid. Based on the provisions of complete instrument content validation in the CVI formula, a content validity test was carried out for the conceptual understanding ability test instrument with a CVI score of 1.00 and the conceptual understanding ability test instrument was declared to have very good validity. Test the reliability test of the ability to understand the concept using the Alpha-Cronbach formula with the results obtained at 0.750 with a high level of reliability.

Learning agility data was measured using an instrument in the form of a closed questionnaire with a Likert scale. For each item in the questionnaire, 5 answer choices were provided. The questionnaire was developed from the agile learner dimensions according to Jatmika and Puspitasari, namely: 1) People's agility: the extent to which a person understands himself, learns from experience, treats others constructively, and adapts to change; 2). Outcome agility: the degree to which a person achieves results despite adversity, inspires others, and instills confidence in others simply by being present; 3). Mental agility: the ability to think about a subject from different perspectives and overcome ambiguity, complexity, and the need to explain one's thoughts to others; 4) Agility of change: the degree to which people are interested in new ideas, have a strong desire to learn new skills and participate in skills development activities (Jatmika & Puspitasari, 2019). The four dimensions are broken down into 12 indicators, each broken down into 30 statements. Table 2 displays the learning agility instrument grid. The CVR findings from calculating each instrument item were 1.00, and the overall CVR for all learning agility instrument items was 30.00, according to the results of testing the validity of the instrument with CVR. As a result, the instrument is deemed legitimate in accordance with the CVR formula's validation provisions. The reliability analysis revealed a Cronbach's Alpha value of 0.867, indicating very high reliability for the developed questionnaire.

No	Basic Competencies	Indicators	Cognitive Level	Number of questions
1	Being able to determine the appropriate assessment instruments to be used in assessing student learning, and	1) Distinguishing instruments that correspond to the realm (cognitive, psychomotor, and affective)	C2	2
		2) Exemplifying instruments that are in accordance with the realm (cognitive, psychomotor, and affective)	C2	2
2	Being able to design an assessment plan through the creation of a learning assessment instrument blueprint	3) Drafting an assessment plan in the form of a Learning-based Instrument Grid	C3	2
2	Being able to develop learning assessment instruments based on the given blueprint	1) Being able to arrange an assessment instrument that is in accordance with the blueprints that have been made	C3	2
		2) Using instruments that have been arranged in the learning process (trial)	C3	2

Table 1. Indicators of understanding the concept of learning assessment and evaluation materials

No	Dimension	Indicator	Number of statements
1	People agility	1. How well do students know themselves.	2
		2. The extent to which students can treat others constructively and resiliently under the pressures of change	2
		3. The extent to which students know their ability in the learning process	2
2	Results agility	4. Students get the results under difficult conditions.	2
		5. How many students inspire others	2
		6. How many students build the confidence of others with their presence	2
3	Mental agility	7. Students think about a problem from a new point of view	3
		8. Students are comfortable with the ambiguity of their thoughts to others	3
		9. Students are comfortable with the complexity of their thoughts to others	2
		10. Students feel comfortable explaining their thoughts to others	3
4	Change agility	11. The extent to which students have a level of curiosity.	3
		12. The extent to which students have a passion for ideas and engage in skills development activities	4
Sum			30

Table 2. Agile learner indicators for learning assessment and evaluation materials

With SPSS 26.0 for Windows, the study's data were quantitatively analyzed using descriptive and inferential statistics. Calculating the average value, standard deviation, maximum value, and minimum value is part of descriptive analysis. The MANOVA test is an inferential statistical technique that is used to examine a hypothesis. A preliminary test, which includes the normality test of data distribution with Kolmogorov-Smirnov, the homogeneity of variance test with Levene Statistics, a multivariate homogeneity test with Box's Test of Equality of Covariance Matrices, and the multicollinearity test, is conducted before hypothesis testing with the MANOVA test.

3. Findings and Discussion

3.1. Result

The learning process was carried out utilizing the SEIE model of e-learning based on PjBL for 8 meetings, and it went according to schedule. Figures 1 and 2 show how learning takes happen. The learning that took place improved the students' comprehension of ideas related to learning assessment and evaluation. The descriptive analysis's conclusions, which are presented in Table 3, confirm the data.

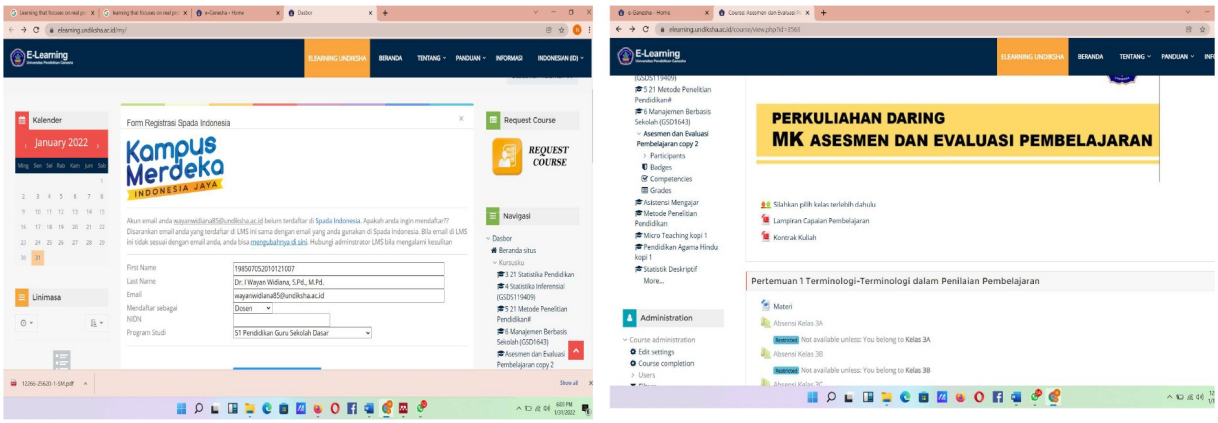

Figure 1. The front pages of the SEIE E-learning model

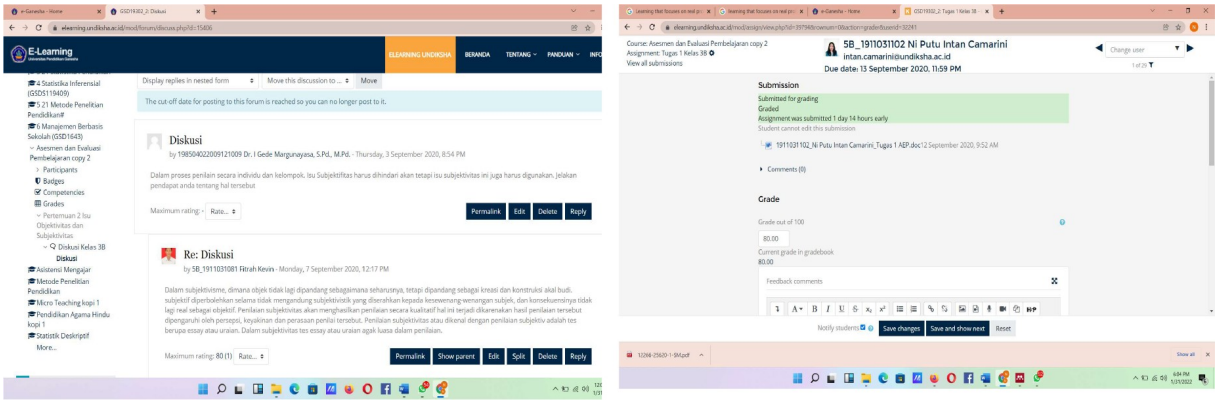

Figure 2. The implementation of learning using the SEIE model based on PjBL

Treatment	Variable	Mean	Std. Deviation	Min.	Max.	Range
A1 (the SEIE model e-learning based on PjBL model)	Ability to understand concepts	85.82	5.69	71	97	26.00
	Agile Learner	84.75	6.58	70	90	26.00
A2 (the SEIE model e-learning based on PjBL model)	Ability to understand concepts	81.17	7.42	68	95	27.00
	Agile Learner	79.20	6.61	62	85	22.00

Table 3. The results of descriptive analysis of students' conceptual understanding abilities and agility

Table 3 shows that there was a difference in the average concept understanding ability of students in the experimental group, as indicated by the difference in the mean of concept understanding ability of 4.65, indicating that the experimental group's concept understanding ability was higher than the control group. Similarly, the students' agile learner abilities differed, as evidenced by a 5.55 difference between the experimental and control groups, where the experimental group's agility results were higher than the control group. It suggests that the SEIE model of e-learning based on PjBL was effective since it provided differences in conceptual understanding and agility. According to the findings of this study, the SEIE model e-learning based on PjBL had a greater impact on students' agile learner abilities than on their ability to understand concepts.

As reported in Table 4, the results of the Kolmogorov-Smirnov normality test revealed a sig. > 0.05, indicating that the data is normally distributed. Both a variance homogeneity test using Levene's Test of Equality and a multivariate homogeneity test using the Box's Test of Equality of Covariance Matrix were used in this study's homogeneity analysis. The Levene's Test of Equality's significance value for conceptual understanding is 0.12 and for learning agility is 0.96. These findings show that the research data is derived from homogeneous data sources. The multivariate data was found to be homogenous based on the results of the homogeneity test using the Box's Test of Equality of Covariance Matrix, which likewise showed a value of sig. of 0.45 with a F value of 0.89.

	Learning Approach	Kolmogorov-Smirnov[a]		
		Statistic	df	Sig.
Ability to understand concepts	The SEIE model e-learning based on PjBL	0.12	28	0.20
	Without the SEIE model e-learning based on PjBL	0.10	28	0.20
Learning Agility	The SEIE model e-learning based on PjBL	0.13	28	0.20
	Without the SEIE model e-learning based on PjBL	0.15	28	0.14

Table 4. Results of Normality Analysis

According to research findings, the multicollinearity test results indicated a tolerance value of 0.99 and a VIF value of 2.55, indicating that there were no signs of multicollinearity between the dependent variables. All prerequisite tests for the MANOVA analysis have been completed, allowing for the use of MANOVA for hypothesis testing, with the outcomes displayed in Table 5 and Table 6.

According to the findings in Table 5, the F coefficient for Roy's Largest Root, Pillar Trace, and Wilks' Lambda Hotelling's Trace was 6617.38 with a Sig. 0.00. It indicates that there was a simultaneous difference in the students' conceptual understanding and learning agility between those who were taught using the SEIE model e-learning based on PjBL and those who were not.

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Intercept	Pillai's Trace	0.99	6617.38	2.00	55.00	0.00	0.99
	Wilks' Lambda	0.00	6617.38	2.00	55.00	0.00	0.99
	Hotelling's Trace	240.63	6617.38	2.00	55.00	0.00	0.99
	Roy's Largest Root	240.63	6617.38	2.00	55.00	0.00	0.99
Treatment	Pillai's Trace	0.19	6.40	2.00	55.00	0.00	0.19
	Wilks' Lambda	0.81	6.40	2.00	55.00	0.00	0.19
	Hotelling's Trace	0.23	6.40	2.00	55.00	0.00	0.19
	Roy's Largest Root	0.23	6.40	2.00	55.00	0.00	0.19

Table 5. The Results of the Manova Test Analysis

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	Conceptual Understanding	313.80[a]	1	313.80	7.11	0.01	0.11
	Agile Learner	446.11[b]	1	446.11	10.26	0.00	0.16
Intercept	Conceptual Understanding	403852.07	1	403852.07	9155.15	0.00	0.99
	Agile Learner	389290.80	1	389290.80	8949.03	0.000	0.99
Treatment	Conceptual Understanding	313.80	1	313.80	7.11	0.01	0.11
	Agile Learner	446.11	1	446.11	10.26	0.00	0.16
Error	Conceptual Understanding	2470.27	56	44.11			
	Agile Learner	2436.05	56	43.50			
Total	Conceptual Understanding	406340.00	58				
	Agile Learner	391727.00	58				
Corrected Total	Conceptual Understanding	2784.07	57				
	Agile Learner	2882.12	57				

Table 6. The Analysis Results of Tests of Between-Subjects Effects

It is clear from the analysis's findings in Table 6 that both conceptual understanding and learning agility had a partial significant impact. The Tests of Between-Subject Effects study results showed in detail that the F value was 7.11 with Sig. 0.01, which was less than 0.05. It shows that the SEIE model of online learning, which is based on PjBL, had an impact on students' conceptual understanding. Additionally, a F value of 10.26 with a Sig. 0.00 that was less than 0.05 was revealed by the analysis of the Tests of Between-Subject Effects. It demonstrates that the SEIE model of online learning, which is based on PjBL, had an impact on learning agility.

3.2. Discussion

The findings revealed that the SEIE model e-learning based on PjBL was beneficial in partially or simultaneously increasing the ability to understand concepts and agility. The results of this research demonstrated that students who were actively involved in their education valued the environment for

learning that the PjBL-based SEIE E-learning model had generated. The resulting learning environment was more conducive to active learners, with students participating in discussion activities in an e-learning system using the SEIE model. Students had better knowledge of the content being presented, in this case, assessment and evaluation of learning, through the discussion process and project work. Given that the SEIE model divides the e-learning learning process into five main steps—formulating learning outcomes, outlining and organizing learning resources, choosing and identifying synchronous and asynchronous learning activities, developing asynchronous learning activities, and designing synchronous learning activities—it is important to note that each of these steps is essential to the learning process (Chaeruman, 2019). It made the learning environment more interesting by using these learning steps and collaborating with PjBL learning. Students learned more comfortably if the learning was more interesting. Students were more motivated to solve the issues if they were taught using this model. To answer the problem, students had to understand the concept that corresponded to the situation at hand, which in this case was the knowledge of assessment and learning evaluation.

Concept understanding is one of the fundamental abilities that students must have before they can conduct higher-order thinking skills. Concept understanding refers to a person's capacity to master a variety of subjects by not just memorizing but also explaining them in various ways (Fitrah, 2017). In the learning process, concept understanding is tightly linked to working memory (Rhodes et al., 2016). The description also shows how understanding the concept plays a significant part in the problem-solving process, with understanding the concept being one of the conditions, as well as the capacity to link concepts and mental readiness in the learning process (Nomleni & Manu, 2018), as well as a thorough understanding of the concept is an absolute requirement in achieving learning success (Widyantari et al., 2020). Understanding the concept in this learning process should be made familiar to students who are used to discovering information on their own. It is in line with the activity processes, which include students mapping and organizing learning resources, selecting and determining synchronous and asynchronous learning activities. These steps will help students understand not just the concept being studied, but also larger information. E-learning enables teachers to offer students access to scientific references linked to their courses (Budi & Nurjayanti, 2013), making it easier for interaction to occur between students and the material or subject matter (Muharto et al., 2019). Based on these descriptions, it can be concluded that students' concept understanding would improve by exposing them to real-world challenges, which necessitated them studying learning material more than they should have. Students would have more learning experiences that they could apply in their daily lives if they studied more. Students would be able to use their learning experiences in different situations as they progressed through the learning process. In other words, the SEIE model e-learning based on PjBL would give experiences that might be applied to new challenges later. An agile learner is someone who can learn from their experiences.

Agile learning is the ability to learn from past experiences and then apply that knowledge to new situations to achieve success (De Meuse et al., 2010). Agility refers to the ability to cope with problems by being flexible and agile in recognizing existing solutions (Jatmika & Puspitasari, 2019). People with high agility will use what they have learned in new settings, and they will seek out challenges and engage in self-reflection (Batcheller, 2016; De Meuse et al., 2010) and someone who is an agile learner will be able to lead others well (Velsor & Wright, 2012). The presence of activities that involve students with difficulties they confront in their everyday lives through problem solving activities is heavily driven by the existence of agile learner development in the educational process (Longmuß & Höhne, 2017). It is in line with current learning applications, such as the SEIE model e-learning based on PjBL. Students are presented with real-life situations that they encounter regularly. Students will get accustomed to developing higher-order thinking skills through problem-based and project-based learning. PjBL learning is a good way to improve their HOTS (Sasson et al., 2018). Students' curiosity will be stimulated by learning that focuses on real-world issues (Malik, 2018).

Furthermore, the SEIE model e-learning based on PjBL allows students to express their opinions in terms of delivering solutions to the given problem solving. The students will be delighted to present the project

successfully. This learning has its own space, particularly a discussion room, where students may express their thoughts. Students converse with one another in the discussion room. The influence of this learning process on students' engagement is obvious. This situation is unquestionably beneficial. Students will be more motivated to participate in class if they are learning alongside their classmates (Oh, 2019). Students go through experiences that are in the form of feedback from their peers, which enhances their learning (Gabriele, Holthaus & Boulet, 2016). Peers support, mentor, and assist others in order to foster collaboration and interaction-based learning (Andersen & Watkins, 2018). Peer-supported learning decreases stress and anxiousness, and as students obtain peer guidance, assistance, and feedback, their confidence rises (Han, Baek & Jeong, 2015; Stone, Cooper & Cant, 2013). Learning that provides opportunities for students to build relationships will make students appreciate other students. Based on these descriptions, curiosity, comfort in the process of expressing opinions and the establishment of relationships between students are indicators of the ability of agile learners. It means that the SEIE model e-learning based on PjBL influences the agile learner's ability.

The results demonstrated that the SEIE model e-learning based on PjBL was successful in enhancing conceptual understanding and agility. It is inextricably linked to how the learning process is carried out. In this case, the SEIE model e-learning based on PjBL emphasizes active learning and students' participation in the learning process. The SEIE e-learning model, which is based on PjBL, allows students to learn to be mature. Learning by facing difficulties and using higher-order thinking skills to solve them are recommended. Learning will become more meaningful as a result of this type of learning procedure. Meaningful learning will provide students experience and help them build their social-emotional feelings, which they may apply later in life (Bressington et al., 2018; Kostiainen et al., 2018). Furthermore, the SEIE model e-learning based on the PjBL learning process has a more positive impact on agile learner abilities. It is because the SEIE model of e-learning based on PjBL allows students to adjust their learning to settings and conditions that are relevant to them. Students will be more comfortable in the learning process with more flexible learning, and good interaction between students and learning resources will emerge.

4. Conclusion

The SEIE model e-learning based on PjBL helped enhance conceptual understanding and learner agility. The difference in the mean scores between the experimental and control groups confirms this finding. Furthermore, the findings revealed that the SEIE model e-learning based on PjBL had a greater impact on the agile learner's capacity than other variables. It may be evident in the development of agile learner indicators including interest, comfort in the learning process, and the formation of positive student relationships. The effectiveness of the SEIE model e-learning based on PjBL might be employed as a useful solution in the learning process, especially to improve the ability of agile learners to understand concepts.

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