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The Effect of Project-Based Learning and Self-Efficacy on Soft Skills in Multicamera Projects

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Abstract

The government focuses on the challenges senior vocational high schools (SMK) face in producing competent and employable graduates. Issues include a lack of curriculum alignment with industry demands, low absorption of graduates in the job market, and mismatched competencies with industry needs, leading to a lack of mental readiness for work among graduates. This research aims to test the soft skills abilities of students being taught with PjBL and conventional models with high and low self-efficacy and the interaction between learning models and self-efficacy towards students' soft skills abilities. This research uses a quasi-experimental design. The research subjects were class XI students at SMKN 1 Blitar. This study selected 33 students in the experimental class and 33 in the control class. Learning in the experimental and control classes was carried out in 6 meetings with multicamera material—analysis of relationship and interaction data between variables using the two-way ANOVA test. The research results show a difference in soft skills abilities among students taught with the PjBL model and what is taught conventionally soft skills in high and low self-efficacy, as well as an interaction between the PjBL model and self-efficacy toward soft skills abilities. The research limitation only supports soft skills learning outcomes.

Keywords Project Based Learning (PjBL); Self-Efficacy; Soft skills; Multicamera

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1. INTRODUCTION

Job competition power in the era of globalization is also one thing that does not can avoided. In this case, class Indonesian workers must compete for a chance at existing work. However, many vocational school graduates are still not adequately qualified to work. Vocational education is directed at learning field specialization so that vocational school graduates have specific skills in various fields. Education in vocational high school prepares for conventional student work, where education must be directed at accommodating interests in traditional work (Rahmadhani et al., 2022; Rahmawati, 2022). However, currently, in vocational school, pay attention to the learning process, which is cognitive rather than psychomotor, although, at the level of discourse, vocational school students are aware that they

must prepare their students for ready work.

According to data from vocational school graduates in 2019, as many as 16,568,470 people were employed, 14,840,920 people were used, and 1,727,164 were unemployed. This means that unemployment is still recorded in a way that amounts to 10.42% nationally. Source: Sakernas (BPS) 2019, processed by Puslitjak. So, from 2017 to 2019, vocational school graduates' unemployment rate was 11.41%. In 2018, unemployed vocational school graduates totaled 11.24%; in 2019, unemployment was 10.42%. However, considering data in vocational schools, where the role of vocational schools in the arena of global market competition is in frame prepare power intermediate skilled, it increasingly shows less trend encouragement if reviewed from facet amount competent graduates and working graduates.

Table 1. IDUKA Absorption Data for 2018, 2019, and 2020 SMKN 1 Blitar

	Work	**Businessman**	**Advanced Study**	**Unemployed**
2018	85%	8%	7%	0%
2019	46%	4%	8%	42%
2020	43%	0%	18%	39%

From the data above, it is clear that a vocational school graduate has many problems. They start from not ready to enter the world of work, competence graduation, No skills possessed for market needs or industry, to say the least, competence skills so that only become power work manufacturer, low industry awards to skill graduate of from vocational school, in the sense that the wages earned are meager, the products produced by vocational school graduates are not in demand sold on the national market. There is not yet cooperation between mutual organizations related to discussing the climate of the business world. The skills possessed are not balanced for vocational school students, and still, many problems are faced, including policy support and attention from the government area or center government.

Education and training at the level of schooling need to equip graduates with various general skills, namely skills in life and career, skills in learning and innovating, and proficiency in utilizing information, media, and technology (Eryandi & Nuryanto, 2020; Miftah et al., 2022; Purnamawati et al., 2022). Skills in life and career have components (Oliveira & Marques, 2024), namely (1) flexibility and adaptability, (2) having initiative and being able to arrange oneself, (3) social and inter-cultural interactions, (4) productivity and accountability in managing projects and produce a product, and (5) leadership and responsibility answer. Next, skills in learning and innovation have components (Haryani et al., 2021; Thornhill-Miller et al., 2023): (1) thinking critically and overcoming problems, (2) skills to communicate and collaborate, and (3) creativity and innovation. Temporary Therefore, information media and technology skills have components (1) literacy information, (2) media literacy, and (3) ICT literacy. Provision proficiency is packaged with 21st-century Skills.

From several problems and challenges mentioned above, the need to take action steps to succeed in the implementation of the Vocational School Revitalization Program in face Power competitive need to take action collaboration among stakeholders (government, private sector, industry, schools, parents) is crucial to enhance soft skills, hard skills, and character development for employment. Implement project-based learning involving stakeholders to align education with industry needs (Yudiono et al., 2021). Standardize vocational education to meet industry requirements through verification and curriculum adjustments. Focus on practical learning for soft skills, hard skills, and character development, involving teachers and parents. Ensure vocational school graduates possess specialized abilities, professionalism, and readiness for the workforce to meet industry standards (Inmandari et al., 2020; Kamdi, 2012).

Existing vocational education models include project-based learning, where students collaboratively work on projects, providing authentic assessments **(Chang et al., 2024; Indrawan & Jalinus, 2020; Roemintoyo & Budiarto, 2023)**. In conventional classes, project-based learning emphasizes collaborative work, problem-solving, and skills development **(Almulla, 2020; Zhang & Ma, 2023)**. Students face challenges, work in teams, and develop communication, time management, research, and critical thinking skills **(Lesman et al., 2023; Wang, 2022)**. Assessment in project-based learning focuses on individual contributions, product quality, and understanding of content. Students reflect on their ideas and influence project outcomes.

The PBL model is a learning method that encourages active and student-centered learning through real-life problem-solving experiences. This model improves students' science skills and promotes creativity and systematic problem-solving **(Kek & Huijser, 2016; Lambie, 2020; Maxwell, 2020)**. In the process, students are invited to think critically and develop 21st-century skills that are much needed in this modern world (Bekteshi, 2017). Implementing this model requires several essential steps. First, it is necessary to identify the competencies that will be developed through the project. These competencies can be knowledge, skills, or attitudes relevant to the project topic. After that, choosing an exciting and relevant topic becomes an important key. The topics chosen should be able to motivate students and connect them to real situations that require solutions. Apart from that, ensuring the availability of adequate resources is no less critical. These resources can be teaching materials, practical tools, and materials, or even resource persons who are experts in related fields. Adjustments to the project time with the academic calendar must also be considered for the project to run smoothly and effectively. This is important so that students do not feel pressured by a project load that is too heavy in a short time. In this project-based learning process, the teacher is a facilitator who helps direct students, provides feedback, and ensures that all students are actively involved in learning. Thus, the Project Based Learning model can effectively improve school learning quality.

The advantages of the project-based learning model and its interactions with self-efficacy must be tested concerning subjects' other learning, such as the live multicamera production lessons in the Broadcasting SMKN 1 Blitar student. To realize achievement results, a live multicamera set in a curriculum requires an appropriate learning model, namely a learning model that can be implemented to support achievement objective learning (Adeshina et al., 2020). This multicamera project requires some description and explanation and help technology for presentation charts, graphs, tables, processes, and interactions to make developing complex and soft skills easier. Besides that, studying a multicamera is not enough; it is only obtained by meeting a staring face with limited time. Through help, study project-based is expected. Students can acquire skills in hard and soft capabilities precisely and meaningfully. This project-based learning model was developed as a project by students to show ability soft skills.

2. METHODS

Design in this research using design or experimental research design. An experimental research design is one purposive quantitative research design that uses procedure-specific methods to determine the impact on outcomes in research subjects (Creswell & Creswell, 2017). The experimental research design used in this research is an actual experiment. True experiments were chosen because this type of experiment can control variables outside the influence of the course of the experiment. So, the quality of the implementation research design (internal validity) is high. In line with the matter, according to Suryabrata (2013), the objective of actual experiments is to investigate the possibility of each other connection because the consequence method gives treatment in the experimental group, and the results compared to groups that do not provide treatment are group control. Besides that, the characteristics from actual experiments are taking samples in the experimental group and group control done randomly or randomly from the population of students numbered broadcasting four classes in

Broadcasting at SMKN 1 Blitar. In this study, a pretest-posttest control group design was used. Neither the control nor the experimental group was given a pretest for different knowledge, beginning with the second group. Good pretest results if the mark group or experimental class is not significant in a way significant.

Validity and Reliability Test

The test instruments used have sufficient to very high validity. The validity of the test will be calculated using the Pearson Product Moment formula using the SPSS application. The test question instruments used have sufficient to very high validity. The invalid test questions are questions number 2, 7, 8, 11, and 12 of the 15 questions. So, ten questions can be used as instruments in this research.

Maruyama and Ryan (2014) stated that reliability was measured on valid question items. This bias can occur due to changes in phenomena or is related to the respondent's memory. The formula used is *Product Moment* correlation assisted by the SPSS application with an alpha of 5%. A reliability value of sig = 0.671 was obtained, so it can be concluded that the test instrument used is reliable with high criteria.

Data Analysis

Research results for test hypothesis used in this research analysis Two-way ANOVA. Anova test aims to know a) the effects mainly from an independent variable, b) the interaction between variable independent and variable dependent, and c) the strong connection between the dependent variable.

3. FINDINGS AND DISCUSSIONS

Finding

Research subjects based on learning models are presented in Table 2.

Table 2. Distribution of Research Subjects Based on Learning Models

Learning model	Number	Percentage (%)
PjBL	33	50
Conventional	33	50
Total	66	100

Apart from being based on learning models, research subjects are also grouped based on their self-efficacy, which is high and low. Based on stuffing, they are in instrument self-efficacy with the content research subject, which will then calculate the magnitude of objectivity self from range score 1-4 from each item. Based on the self-efficacy, distribution data was obtained in Table 4.2 below.

Table 3. Distribution of Research Subjects Based on Self-Efficacy

Self-efficacy	Number	Percentage (%)
High	45	68%
Low	21	32%

Based on Table 3, it can be explained that all students who became the research subjects were 66 students. These students have high self-efficacy at 68%, and those with low self-efficacy at 32%.

Before experimental research is carried out using the PjBL and conventional model, especially formerly given a pretest to research subjects. This pretest aims to obtain an initial data overview of subject research, which has capabilities relatively early. Aside from that, new changes and improved soft skills after the subject was given treatment, namely in the experimental class, compared to results

studied in the control class. Before the results, the study pretest was analyzed with the ANOVA test, especially for formerly tested data normality. Test the normality of pretest data in both experimental and experimental classes.

Table 4. Pretest Data Normality Test

Tests of Normality

	Kolmogorov-Smirnov [a]			Shapiro-Wilk		
	Statistics	**df**	**Sig.**	**Statistics**	**df**	**Sig.**
Experimental Class	.148	33	.066	.971	33	.495
Control Class	.140	33	.098	.936	33	.052

a. Lilliefors Significance Correction

A pretest normality test was obtained with Kolmogorov Smirnov for the experimental class soft skills. The result is 0.066 > 0.05, and the control class was 0.098 > 0.05, which means significant, so it was concluded that the data was normally distributed.

Table 5. Homogeneity Test of Pretest Data

Levene Statistics	**df1**	**df2**	**Sig.**
1.563	5	25	.207

Obtained results at 95% significance in soft skills 0.207 > 0.05, meaning the data taken from each experimental and control class was stated to be homogeneous. After obtaining results analysis of the normality and homogeneity test of the pretest data is regularly and homogeneous, we will test statistically different pretest results, soft skills, and application in experimental and control classes in Table 6.

Table 6. Difference Test Pretest Soft Skills in the Experimental and Control Class

		t-test for Equality of Means				
		Q	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**
Soft skills Pretest	Equal variances assumed	.136	64	.892	.333	2.447
	Equal variances not assumed	.136	63.994	.892	.333	2.447

Based on Table 6, the test results show that different soft skills were studied in the experimental and control classes with the PjBL model, and the conventional learning level is 0.892 > 0.05, which means that it is Insignificant. So, there is a difference in the ability to begin soft skills in the experimental and control classes.

Table 7. Post-Test Data Normality Test Based on Learning Model

Tests of Normality

	Kolmogorov-Smirnov [a]			Shapiro-Wilk		
	Statistics	**df**	**Sig.**	**Statistics**	**df**	**Sig.**
PjBL Model	.123	33	.200 *	.965	33	.365
Conventional Model	.129	33	.176	.958	33	.234

a. Lilliefors Significance Correction

Table 7 shows the post-test data normality test using SPSS on data about soft skills based on learning models PjBL and conventional. Kolmogorov Smirnov test results were obtained. The result's PjBL is 0.200, and the conventional is 0.176, which is more significant than 0.05.

Table 8. Soft Skills Data Homogeneity

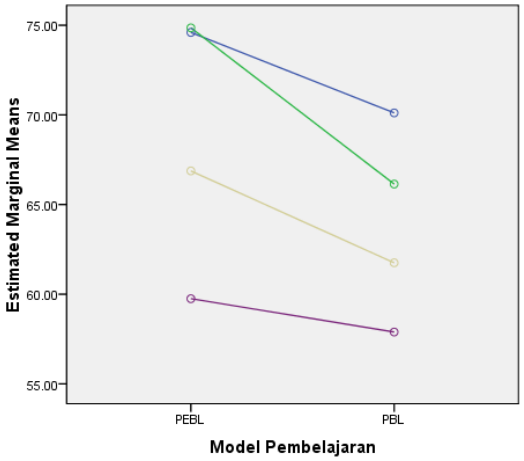
	Levene Statistics	**df1**	**df2**	**Sig.**
Based on Model	,442	1	64	,509
Based on Self-Efficacy	2,314	3	62	,085

Based on the Test of Homogeneity of Variances test in Table 8, the result is 0.509 and 0.085 > 0.05, which means soft skills data is homogeneous, as seen from self-efficacy-based variance-covariance. Effect test results are variable independent to variable dependent, as presented in Table 9.

Table 9. Effect Test Results Variable Independent to Variable Dependent

Source	**Type III Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**	**information**
Corrected Model	2476,597 [a]	7	353,800	3,710	.012	
Intercept	287910.153	1	287910.153	1,392	,000	significant
A	414,683	1	414,683	3,004	.012	Significant
B	1949,546	3	649,849	4,141	,032	Significant
a*b	91.017	3	30,339	3,147	.031	significant
Error	11999,767	58	206,893			
Total	306744,000	66				
Corrected Total	14476.364	65				

a. R Squared =.717 (Adjusted R Squared =.648)



The following is an explanation of the analysis of the results of two-way ANOVA. 1) There is a meaningful difference in soft skills taught to students with PjBL and conventional models; 2) There is a difference in ability and soft skills in students with self-efficacy; and 3) There is an interaction between learning models with self-efficacy ability and soft skills.

Table 10 is the Tukey Post Hoc Table used To evaluate the category where variable self-efficacy of students with significant differences.

Table 10. Multiple Comparisons

(i) Self-Efficacy	(J) Self-Efficacy	Mean Difference (IJ)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
High Self-Efficacy	Self-Efficacy Low	13.71 *	4,802	,030	1.01	26.41
Self-Efficacy Low	High Self-Efficacy	-8.16	4,881	,348	-21.07	4.75

Based on observed means.

The error term is Mean Square (Error) = 206.893.

*. The mean difference is significant at the 0.05 level.

Based on Table 10 in the Mean Difference (IJ), there is the sign (*) on the Mean Difference (IJ) next to the correct numbers. This matters. There is a significant difference between self-efficacy tall and self-efficacy low. Differences between individuals with high and low self-efficacy can influence various aspects of life, including the method students face learning challenges, motivation, and achievement objectives.

Discussion

Students' soft skills can be seen in how they think and solve the problems they are given. Attitudes and behavior when collaborating or doing group assignments with friends, language style when communicating between friends and in front of the class, responding to behavior to continue learning and being able to manage information relevantly, and leadership skills. Soft skills are essential in learning, especially how students behave and act when facing learning problems, building cooperation, and developing creative thinking. All of these abilities can be developed through interactive learning activities.

So, the abilities that can be developed are the cognitive and psychomotor domains characterized by mastery of learning material and skills and the domain of the student's personality. These soft skills are necessary for students because having good soft skills will make it easier for them to enter college

and the world of work. The soft skills aspects in Project-Based Learning Multicamera Projects include collaboration, communication, lifelong learning, and managing information and leadership skills. The achievement of soft skills aspects of all students in each aspect will be discussed as follows.

a. Aspects of Thinking and Problem-Solving Skills

Figure 1. Student Thinking Skills in Solving Problems Related to Multicamera Projects

A person's thinking and problem-solving skills can identify and analyze problems, get ideas, look for alternative solutions, and make conclusions based on valid evidence. Student worksheets contain questions representing indicators of thinking and problem-solving skills. The results of the analysis carried out on students' worksheets showed that they reached the excellent category.

Collaboration Skills

Figure 2. Collaboration Process in Multicamera Projects

In the Project-based learning model, there is a stage of planning experiments to create the project. Students actively show their contribution as group members in the planning. Students are enthusiastic in carrying out the practicum. Students can build relationships and interact with group members by helping each other during the practicum and coordinating tools and materials.

b. Communication Skills

Figure 3. Communication Process in Multicamera Projects

Communication skills are observed during group discussions and presentations in front of the class. During the discussion, students were seen exchanging information with members of their fellow groups and other groups. This shows that there is good communication between one group and another. During the presentation, students looked enthusiastic in providing responses or responses to different groups that informed the discussion results.

1) Lifelong Learning and Managing Information

The ability to find and manage relevant information from various sources is also a criterion in forming this soft skills aspect. Based on this explanation, four sub-aspects will be examined during learning activities. These include students being able to manage relevant information from various sources, asking questions about things they do not understand, observing any changes that occur during the practicum, and recording practicum results data.

Figure 4. Process of Managing Information in Multicamera Projects

Students have managed relevant information from various sources well during the discussion. Students use books, the internet, and teachers as sources of information they will collect, and the information they collect is used to complete the projects given during learning.

2) Leadership Skills

Leadership skills are the ability to lead various activities and tasks. Leadership is an essential aspect of every group because it will determine the performance of all group members. A good leader must be able to lead a project in its planning and, in the process of making it, participate in what the group members are doing so that they can be a leader until the project is completed. The interview results showed that five students were dominant followers, while one said he could direct and was willing to accept direction from other group members.

Figure 5. Leadership Skills in Multicamera Projects

3) PjBL Model for Soft Skills Ability

In multicamera learning, soft skills factors are significant for students because multicamera content is contextual or closely related to real objects in the natural surroundings (Fouze & Amit, 2017; Kusuma et al., 2017; Rismaningtyas et al. ., 2020). According to Arikunto (2014), the natural form of students'

understanding (comprehension) can be seen from understanding superficial relationships between facts or concepts. However, Sudjana (2016) further details the meaning of understanding into three categories, namely: (1) understanding of translation, which is the lowest level, namely starting from translating in the true sense and interpreting the principles, (2) understanding of interpretation which is the second level, namely connecting initial parts with what is known next, or connecting with events, distinguishing the main from the non-main, and (3) understanding extrapolation which is the third or highest level. These three levels of understanding can be applied to multicamera phenomena in studying multicamera.

Understanding multicamera learning includes understanding meaning, interpolation, interpretation of instructions, and problems. According to Amaludin (2022), the sense of experience is one level of thinking about something and seeing it from various aspects. In learning multicamera, apart from memorizing, students must also understand the meaning contained, for example, being able to explain a multicamera phenomenon, interpreting graphs, charts, or diagrams, and explaining concepts or principles in their own words. Soft skills abilities are essential for students because by understanding the correct concepts, students can absorb, master, and store material in their memory for an extended period.

The results of this research are similar to the results of Elmasari (2018), where there is a significant difference in average test scores between students taught using the PjBL model and the learning outcomes of students taught using the PjBL model are higher. Likewise, the research results by Afrianti et al. (2020) also reached the same conclusion: the learning outcomes of students' performance using the PjBL learning model showed significant differences in learning outcomes.

The superior learning outcomes in the soft skills aspect of the PjBL model are because the PjBL learning model refers to contextual elements close to students' daily lives. The significant influence of the PjBL model on soft skills abilities shows that the attachment of project elements provides a learning stimulant that strongly influences students in improving academic performance and thinking skills (Perdana & Isrokatun, 2019; Vasquez, 2017). This gives rise to the idea that the role of projects in learning should have a broader influence on society and education, especially for vocational school students (Barton, 2016). This role is authentic, but the most important thing is our effort and hard work to present work project concepts into learning activities so that these concepts can relate directly to students' culture and their daily experiences (Begg & Hamilton, 2001; Rosa & Orey, 2010).

The determination of the soft skills variable in this research is based on the importance of the understanding aspect in learning. In meaningful learning, learning that emphasizes soft skills is significant. Solihah et al. (2021) state that soft skills include all conceptual knowledge, and more complex knowledge includes (classifications and categories, principles and generalizations, theories, models, and structures). Furthermore, Maidani et al. (2017) stated that understanding is the foundation for students to build insight and wisdom. According to Walsh (2017), students cannot develop as problem solvers without having soft skills, so soft skills are a prerequisite for problem-solving. Thus, soft skills are essential in learning.

Research (Supiandi & Julung, 2016) states that learning with the PjBL model is not significantly different from other PjBL models. The results of other research are the research findings of Lusiana & Andari (2020), which concluded that the PjBL learning model is more effective than the STAD learning model (a learning model that has been implemented in schools) on mathematics learning achievement is there a difference in the influence of the AQ of students in the climber, camper categories? , and quitter on mathematics learning achievement, and whether there is an interaction between the learning model and students' AQ on mathematics learning achievement.

The difference in conclusions between the results of this research and the results of research by Lusiana & Andari (2020), Aulia et al. (2019), and Ermawati & Wiyarno (2022) may be caused by differences in research subjects, the process of understanding learning material, and the learning

process. The subjects of this research are students. Students may have high learning responsibilities at a relatively more mature level, so implementing the PjBL model can run very well. When learning is carried out in class, students do not experience difficulties in understanding multicamera learning material.

4) Soft skills Ability Based on Self-efficacy

This research found significant differences in soft skills abilities between students taught using the PjBL and conventional models and learning outcomes of students with high and low self-efficacy. The results of this research align with research by Risnawati et al. (2018), which concluded that the test results of students in the experimental class were higher than those in the control class because experimental class students had high self-efficacy. Likewise, Yusnidah's (2020) research shows an interaction between learning models and self-efficacy on student learning outcomes.

Another study that obtained similar conclusions was conducted by (Yuniantoro et al., 2022). The results of the research show that there is a match between self-efficacy and student learning outcomes. The study concluded that for students whose self-efficacy was included in the moderate criteria, their learning outcomes were in the sufficient category. Meanwhile, students with low self-efficacy obtained learning outcomes included in the low category. Based on the results of this research, it can be concluded that student self-efficacy positively influences student academic achievement.

Based on several research findings, it can be said that students' self-efficacy greatly determines learning success in the PjBL learning model. In this case, students' self-efficacy influences students' soft skills abilities; namely, the higher the self-efficacy, the higher the learning outcomes. Conversely, the lower the self-efficacy, the lower the learning outcomes. Higher soft skills abilities in students with high self-efficacy occur due to students' high self-confidence, followed by students' performance in learning multicamera concepts, which is also high so that students can learn optimally, and in turn, their learning outcomes will also be high.

Research results (2020) also found that self-efficacy influences students' learning motivation. In this case, the actual activity for students with high learning motivation is shown by increasing study time, being disciplined in attending class, having the courage to ask questions, and developing learning material topics through making lists. This proves that students with high self-efficacy will have high learning motivation, so their academic performance will also be high. Conversely, students with low self-efficacy will have low motivation, which can result in low academic performance.

In this case, Antoni and Kurniawan (2022) stated that implementing PjBL learning also increases student participation in learning. This happens because the projects presented have high appeal and challenge for students. This high level of student learning participation can encourage optimal learning implementation. Thus, using information technology in learning can increase motivation, and high motivation influences student involvement. Furthermore, learning involvement in the classroom can improve the learning process. Increasing this optimal learning process can affect students' learning success.

Regarding the impact of self-efficacy on soft skills, the first thing that must be done is to remember the positive effects of self-efficacy in the professional world, as self-efficacy can improve or damage performance through its impact on cognitive, affective, and psychomotor skills. Training soft skills metacognition is proven effective and efficient in maintaining performance, engagement, and well-being by increasing self-efficacy. Self-efficacy is even more interesting than the literature on the influence of soft skills training on self-efficacy, which produces conflicting results with less reliable methods.

4. CONCLUSION

Based on the description of the research results and discussion above, the following conclusions can be obtained: 1) There are differences in soft skills abilities between students taught using the PjBL and conventional models; 2) There are differences in soft skills abilities between students who have high and low self-efficacy; 3) There is an interaction between the learning model and self-efficacy on soft skills abilities. This shows that the PjBL model variables and self-efficacy interact with soft skills and abilities.

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