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The Influence of Problem-Solving Skills and Self-Efficacy on Learning Outcomes in Skills Concentration Subjects

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Abstract: This research is quantitative and aims to determine the impact of problem-solving skills and student self-efficacy on academic performance across various skill concentrations at SMK Negeri 1 Semen, Kediri Regency. The study focused on the subjects of Accounting (AKL), motorcycle engineering and business (TBSM), automotive light vehicle engineering (TKRO), and computer and network engineering (TKJ). Data collection involved questionnaires for assessing problem-solving skills and self-efficacy, while academic performance was measured through tests. The study included 185 students from all specialization concentrations at SMK Negeri 1 Semen, Kediri Regency. Data analysis utilized t-tests (partial test), f-tests (simultaneous test), and r2-tests or coefficient of determination tests. The research findings indicated that the significance level of the partial test for problem-solving skills was .002 < .050 and for self-efficacy was .003 < .050. The f-test revealed a significance value of .000 < .050. The results suggest that problem solving skills and self-efficacy significantly impact student academic performance across all skill concentrations, both individually and collectively.

Abstrak: *Penelitian ini bersifat kuantitatif dan bertujuan untuk mengetahui pengaruh kemampuan pemecahan masalah dan efikasi diri siswa terhadap prestasi akademik di berbagai konsentrasi keahlian di SMK Negeri 1 Semen, Kabupaten Kediri. Penelitian ini difokuskan pada mata pelajaran Akuntansi (AKL), teknik dan bisnis sepeda motor (TBSM), teknik kendaraan ringan otomotif (TKRO), dan teknik komputer dan jaringan (TKJ). Pengumpulan data menggunakan kuesioner untuk menilai kemampuan pemecahan masalah dan efikasi diri, sementara prestasi akademik diukur melalui tes. Penelitian ini melibatkan 185 siswa dari semua konsentrasi keahlian di SMK Negeri 1 Semen, Kabupaten Kediri. Analisis data menggunakan uji-t (uji parsial), uji-f (uji simultan), dan uji r2 atau uji koefisien determinasi. Temuan penelitian menunjukkan bahwa tingkat signifikansi uji parsial untuk kemampuan pemecahan masalah adalah .002 < .050 dan untuk efikasi diri adalah .003 < .050. Uji f menunjukkan nilai signifikansi sebesar .000 < .050. Hasil penelitian menunjukkan bahwa keterampilan pemecahan masalah dan efikasi diri secara signifikan berdampak pada kinerja akademik siswa di semua konsentrasi keahlian, baik secara individu maupun kolektif.*

INTRODUCTION

Vocational High School (SMK) is an educational level that equips students to enter various professional fields. The vocational school curriculum covers a range of skill competencies tailored to specific industries. Graduates of vocational schools are expected to be highly

productive, capable of working independently in their chosen field with determination and persistence (Gumelar & Gunadi, 2017). The school's aim is to produce graduates who are well-prepared for professional roles in the workforce. In the age of Industry 4.0, individuals need to compete effectively across different sectors. Therefore, comprehensive skill development is crucial for students, teachers, school resources, and all elements contributing to academic success.

The implementation of learning at SMK Negeri 1 Semen Kediri is well-prepared to enhance and strengthen students' competencies. At SMK Negeri 1 Semen, there are four skill competencies including Accounting (AKL), Motorcycle Engineering and Business (TBSM), Automotive Light Vehicle Engineering (TKRO), and Computer and Network Engineering (TKJ). Each skill competency has its own unique characteristics. For instance, the AKL skill competency demands deep thinking and reasoning, precision, as well as patience and perseverance to complete lesson materials. The TBSM skill competency requires strong analytical skills, understanding of basic concepts and operations, proficiency in using various equipment, and accuracy (Sudirman, 2016).

Meanwhile, TKRO's technical competency skills must include good analytical, evaluation, conceptual, and metacognitive abilities (DITPSMK, 2013). In addition to these three skill competencies, TKJ also presents its own level of difficulty that students need to overcome. They must demonstrate caution when dealing with computer and network installations. Furthermore, they will encounter challenges in case of installation errors or damages. Students should have a thorough understanding of the logical flow of computers and networks and follow procedures meticulously to prevent errors. All skill competencies will be essential when students enter the workforce, as they will need to address various challenges, particularly in the technical field.

An important factor in an efficient work environment is having a problem-solving oriented behavior, as well as scanning the environment for new opportunities in the job market (Varadinov et al., 2022). Apart from that, problem-solving skills are crucial as an individual's level of ability is essential in today's competitive job market. When facing limited job opportunities, individuals in the workforce who possess strong problem-solving skills can generate initiatives and innovative ideas to navigate challenges arising from the intensifying job competition (Arfensia et al., 2021). Given the diverse range of issues that may arise, adept problem-solving skills serve as a key indicator of an individual's capability to effectively address challenges.

Problems that are challenging in the workplace must be effectively addressed and resolved by a skilled professional. A professional worker should possess strong problem-solving abilities, which are crucial in the era of Industry 4.0. It is undeniable that problem-solving skills are essential for students preparing to enter the workforce. By being able to solve problems, students are expected to be able to think critically. Critical thinking requires many skills, including the skills of listening and reading carefully, looking for and getting hidden assumptions, and exploring the consequences of a statement (Sulistyowati, 2015). Hence, skill competency learning activities at SMK Negeri 1 Semen, Kediri Regency focus on equipping students with problem-solving skills across all skill concentrations. To achieve this goal, it is undeniable that students perceive each area of expertise, particularly in engineering and mechanical fields, as containing complex material.

Given students' current perception of this complexity, which includes machine components, their functions, and various calculations, it is highly likely that those who find it challenging may continue to struggle with learning this material in the long run. This difficulty impacts students, making it challenging for them to grasp components, numbers, or logic effectively, resulting in suboptimal mastery of the subject. Proficiency in skill competencies demands significant focus from students to tackle problems. Looking at student learning outcomes, they remain low, and students' problem-solving abilities are still lacking. Achieving learning objectives successfully necessitates support from various other factors.

Self-efficacy is a crucial factor to consider in achieving learning objectives successfully. It is not just about abilities; confidence stemming from self-efficacy enables individuals to tackle challenges effectively (McCoach et al., 2013). Elevating students' self-efficacy levels is essential for enhancing their chances of attaining positive learning outcomes. With high self-assurance, students can proficiently handle demanding tasks, including complex subjects like engineering and mechanical expertise. Strong self-efficacy is highly valued in the professional realm as it fosters a proactive work attitude. The level of self-efficacy significantly correlates with favorable outcomes for employees, such as well-being, work engagement, and accomplishments (Kodden, 2020).

However, student self-efficacy at SMK Negeri 1 Semen is still low. Low student self-efficacy is assessed through the answers and responses to a problem given by the teacher in the classroom when students are involved in it and when asking questions (Ratu et al., 2021). It is necessary to strengthen students' self-efficacy and train them continuously to reinforce their inner beliefs. In this way, students can engage in learning activities with optimal concentration and expertise. Therefore, research needs to be conducted to determine the impact of problem-solving skills and self-efficacy on student learning outcomes in all expertise concentrations at SMK Negeri 1 Semen.

METHOD

This type of research is quantitative research to determine the influence of problem-solving skills and self-efficacy on student learning outcomes in skill concentration subjects using a multiple linear regression pattern. Research data collection uses questionnaires for problem solving skills and self-efficacy, while learning outcomes use tests. The research subjects were 185 students in all expertise concentrations at SMK Negeri 1 Semen, Kediri Regency. Research data analysis uses t-test (partial test), f-test (simultaneous test) and r^2-test or coefficient of determination test. The research prerequisites were tested for validity and reliability on the instruments used in the research. Apart from that, classical assumption tests were carried out including normality tests, multicollinearity tests, heteroscedasticity tests and linear regression tests. The problem-solving skills questionnaire consists of 20 items covering 4 indicators including: 1) understanding; 2) planning completion (planning); 3) resolving the problem (solving), and 4) checking again (checking). The self-efficacy questionnaire consists of 28 items covering 4 indicators including: 1) independence and perseverance; 2) self-regulation; 3) simple tasks; and 4) complex tasks. Student learning outcomes are measured through a summative exam assessment, each skill competency consisting of 20 multiple choice questions.

RESULTS AND DISCUSSION

Before conducting research, the validity of all instruments that will be used is assessed first. Validity encompasses instruments measuring problem-solving skills, self-efficacy, and expertise in each concentration. Each concentration area has its own specific test instrument. The test instruments include the AKL expertise concentration in table 3, the TBSM expertise concentration in table 4, the TKRO expertise concentration in table 5, and the expertise concentration in table 6.

The validity of the questions is evaluated using the Pearson product-moment test with a two-way significance level with df = N - 2 = 93 - 2 = 91, where the critical r value is .203.

Table 1. Validity of Problem-Solving Skills Items

Item	r-count	r-table	Validity	Item	r-count	r-table	validity
1	0,458	0,203	Valid	11	0,481	0,203	Valid
2	0,433	0,203	Valid	12	0,470	0,203	Valid
3	0,420	0,203	Valid	13	0,459	0,203	Valid
4	0,353	0,203	Valid	14	0,390	0,203	Valid
5	0,274	0,203	Valid	15	0,374	0,203	Valid
6	0,279	0,203	Valid	16	0,215	0,203	Valid

7	0,413	0,203	Valid	17	0,473	0,203	Valid
8	0,290	0,203	Valid	18	0,268	0,203	Valid
9	0,421	0,203	Valid	19	0,341	0,203	Valid
10	0,309	0,203	Valid	20	0,447	0,203	Valid

Table 2. Validity of Self-efficacy Items

Item	r-count	r-table	Validity	Item	r-count	r-table	validity
1	0,478	0,203	Valid	15	0,575	0,203	Valid
2	0,569	0,203	Valid	16	0,712	0,203	Valid
3	0,485	0,203	Valid	17	0,550	0,203	Valid
4	0,472	0,203	Valid	18	0,365	0,203	Valid
5	0,716	0,203	Valid	19	0,391	0,203	Valid
6	0,659	0,203	Valid	20	0,421	0,203	Valid
7	0,644	0,203	Valid	21	0,508	0,203	Valid
8	0,532	0,203	Valid	22	0,455	0,203	Valid
9	0,471	0,203	Valid	23	0,401	0,203	Valid
10	0,750	0,203	Valid	24	0,396	0,203	Valid
11	0,290	0,203	Valid	25	0,538	0,203	Valid
12	0,726	0,203	Valid	26	0,594	0,203	Valid
13	0,713	0,203	Valid	27	0,323	0,203	Valid
14	0,468	0,203	Valid	28	0,499	0,203	Valid

Table 3. Validity of AKL Skill Concentration Test Items

Item	r-count	r-table	Validity	Item	r-count	r-table	validity
1	0,632	0,203	Valid	11	0,579	0,203	Valid
2	0,771	0,203	Valid	12	0,747	0,203	Valid
3	0,785	0,203	Valid	13	0,738	0,203	Valid
4	0,619	0,203	Valid	14	0,630	0,203	Valid
5	0,662	0,203	Valid	15	0,625	0,203	Valid
6	0,773	0,203	Valid	16	0,632	0,203	Valid
7	0,758	0,203	Valid	17	0,755	0,203	Valid
8	0,788	0,203	Valid	18	0,785	0,203	Valid
9	0,763	0,203	Valid	19	0,625	0,203	Valid
10	0,619	0,203	Valid	20	0,597	0,203	Valid

Table 4. Validity of TBSM Skill Concentration Test Items

Item	r-count	r-table	Validity	Item	r-count	r-table	validity
1	0,566	0,203	Valid	11	0,660	0,203	Valid
2	0,526	0,203	Valid	12	0,569	0,203	Valid
3	0,582	0,203	Valid	13	0,511	0,203	Valid
4	0,612	0,203	Valid	14	0,480	0,203	Valid
5	0,549	0,203	Valid	15	0,506	0,203	Valid
6	0,468	0,203	Valid	16	0,509	0,203	Valid
7	0,364	0,203	Valid	17	0,448	0,203	Valid
8	0,488	0,203	Valid	18	0,565	0,203	Valid
9	0,615	0,203	Valid	19	0,444	0,203	Valid
10	0,466	0,203	Valid	20	0,554	0,203	Valid

Table 5. Validity of TKRO Skill Concentration Test Items

Item	r-count	r-table	Validity	Item	r-count	r-table	validity
1	0,363	0,203	Valid	11	0,680	0,203	Valid
2	0,414	0,203	Valid	12	0,343	0,203	Valid
3	0,533	0,203	Valid	13	0,282	0,203	Valid
4	0,300	0,203	Valid	14	0,296	0,203	Valid
5	0,568	0,203	Valid	15	0,498	0,203	Valid
6	0,451	0,203	Valid	16	0,305	0,203	Valid
7	0,257	0,203	Valid	17	0,208	0,203	Valid
8	0,666	0,203	Valid	18	0,635	0,203	Valid

9	0,646	0,203	Valid	19	0,325	0,203	Valid
10	0,468	0,203	Valid	20	0,482	0,203	Valid

Table 6. Validity of TKJ Skill Concentration Test Items

Item	r-count	r-table	Validity	Item	r-count	r-table	validity
1	0,623	0,203	Valid	11	0,278	0,203	Valid
2	0,538	0,203	Valid	12	0,663	0,203	Valid
3	0,421	0,203	Valid	13	0,526	0,203	Valid
4	0,364	0,203	Valid	14	0,701	0,203	Valid
5	0,696	0,203	Valid	15	0,344	0,203	Valid
6	0,511	0,203	Valid	16	0,170	0,203	Valid
7	0,234	0,203	Valid	17	0,362	0,203	Valid
8	0,366	0,203	Valid	18	0,230	0,203	Valid
9	0,245	0,203	Valid	19	0,340	0,203	Valid
10	0,293	0,203	Valid	20	0,379	0,203	Valid

Based on the results of the validity test, all 20 items of the problem-solving skills instrument presented in Table 1 were deemed valid. Similarly, all 28 items of the self-efficacy instrument in Table 2 were also declared valid. The AKL skill concentration test, comprising 20 questions, was found to be valid. The TBSM skills concentration test, with a total of 20 questions, was also declared valid. The TKRO skill concentration test, consisting of 20 questions, was validated. Likewise, the TKJ skills concentration test, with 20 questions, was confirmed to be valid. In conclusion, all data collection instruments, including questionnaires and test instruments, have been deemed valid. The results of reliability testing are presented in Table 7. Reliability testing was conducted on all instruments.

Table 7. Reliability Test Results of Question Items

Instrument	Cronbach's Alpha	N of items
Problem Solving Skill	.686	20
Self-efficacy	.903	28
Test Keahlian AKL	.943	20
Test Keahlian TBSM	.860	20
Test Keahlian TKRO	.778	20
Test Keahlian TKJ	.747	20

Based on the results of the reliability test presented in Table 7, it is evident that the reliability values of the instruments were as follows: problem-solving skills instrument (.686 > .050), self-efficacy instrument (.903 > .050), AKL skills concentration test instrument (.943 > .050), TBSM skills concentration test instrument (.860 > .050), TKRO skill concentration test instrument (.778 > .050), and TKJ skill concentration test instrument (.747 > .050). Since all instruments achieved a reliability value greater than .050, they can be considered reliable. Therefore, it can be concluded that all instruments are both valid and reliable for collecting research data. All instruments were used to collect research data. All collected data was tested for normality, as shown in Table 8. The normality test covers the variables of problem solving, self-efficacy, and learning outcomes.

Table 8. Normality Test Results

Tests of Normality						
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Problem Solving Skill	.059	185	.200*	.992	185	.398
Self-efficacy	.059	185	.200*	.992	185	.410
Learning Outcomes	.049	185	.200*	.992	185	.372

Based on the results of the normality tests in Table 8, it is evident that the values for problem-solving skills using the Kolmogorov-Smirnov test yielded a significance of .200 > .05,

and the Shapiro-Wilk test resulted in a significance of .398 > .050. The analysis of self-efficacy values using the Kolmogorov-Smirnov test showed a significance of .200 > .050, while the Shapiro-Wilk test yielded a significance of .410. Similarly, the normality tests for student learning outcomes indicated that the Kolmogorov-Smirnov test resulted in a significance of .200 > .050, and the Shapiro-Wilk test showed a significance of .372. Therefore, it can be concluded that the data related to problem-solving skills, self-efficacy, and learning outcomes are all normally distributed.

Table 9. Multicollinearity Test

Coefficients[a]			
		Collinearity Statistics	
Variable		Tolerance	VIF
1	Problem Solving Skill	.995	1.005
	Self-efficacy	.995	1.005
a. Dependent Variable: learning_outcomes			

Next, a multicollinearity test was conducted following a prior normality test, which confirmed that all data values were normally distributed. The multicollinearity test results are presented in Table 9. Calculating tolerance values and VIF values forms the foundation for assessing multicollinearity. Based on the results of the multicollinearity test in Table 9, it is shown that each independent variable has a tolerance value of .995 > .10. Meanwhile, the VIF value is 1.005 < 10.00. Therefore, based on this data, it can be stated that there is no multicollinearity.

Table 10. Heteroscedasticity Test Results

Coefficients[a]						
		Unstandardized Coefficients		Standardized Coefficients		
Variable		B	Std. Error	Beta	t	Sig.
1	(Constant)	1.409	2.111		.667	.505
	Self-efficacy	.010	.017	.042	562	.575
	Problem Solving	-.009	.017	.041	-.556	.579
a. Dependent Variable: ABS_RES						

The following heteroscedasticity test is conducted and presented in Table 10 after previously performing a multicollinearity test. Based on the results of the analysis, no multicollinearity is detected. The heteroscedasticity test aims to ensure that there is no variance inequality in the regression model by examining the residuals. Heteroscedasticity is not present if the Sig value > .050, indicating no need for decision-making. The results of the heteroscedasticity test indicate that the problem-solving skills variable yielded a significance level of .579, which is greater than .050, and the self-efficacy variable yielded a significance level of .575. According to the decision-making results, there is no heteroscedasticity present in the data.

Table 11. Linear Regression Test Results

Coefficients[a]						
		Unstandardized Coefficients		Standardized Coefficients		
Variable		B	Std. Error	Beta	t	Sig.
1	(Constant)	89.247	3.642		24.507	.000
	Problem Solving Skill	.091	.029	.218	3.097	.002
	Self-efficacy	-.088	.029	-.213	3.015	.003
a. Dependent Variable: learning_outcomes						

The next test is multiple linear regression. The results of the linear regression test are presented in Table 11. This test is one of the requirements following the heteroscedasticity test. Berdasarkan perolehan hasil uji regresi linear berganda pada tabel 8, adalah sebagai berikut:

Y = 89.247 + 0.091 + 0.88 + e

Table 12. Partial Test Results (t-test)

Coefficients[a]						
		Unstandardized Coefficients		Standardized Coefficients		
Variable		B	Std. Error	Beta	t	Sig.
1	(Constant)	89.247	3.642		24.507	.000
	Problem Solving Skill	.091	.029	.218	3.097	.002
	Self-efficacy	-.088	.029	-.213	3.015	.003
a. Dependent Variable: learning_outcomes						

Next, hypothesis testing is conducted, which includes partial tests using the t-test, f-test, and r2-test. The results of the partial tests are displayed in Table 12. With a significance level of < .050, it is concluded that there is a significant influence between the independent variable and the dependent variable. Based on the partial test results, it is evident that the problem-solving skills variable obtained a significance level of .002, which is less than .050. Therefore, there is a significant influence of problem-solving skills on learning outcomes. Similarly, the self-efficacy variable obtained a significance level of .003, also less than .050, indicating that self-efficacy influences student learning outcomes.

Table 10. Simultaneous Test (f-test)

ANOVA[a]						
		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	62.165	2	31.082	10.033	.000[b]
	Residual	563.816	182	3.098		
	Total	625.981	184			
a. Dependent Variable: learning_outcomes						
b. Predictors: (Constant), Problem Solving, Self-efficacy						

After testing the initial hypothesis regarding the significant effect of each variable, a simultaneous test was conducted. The results of this simultaneous test are presented in Table 10. It aimed to assess the combined impact of learning motivation and creativity on interest in entrepreneurship. Based on the simultaneous results, it is evident that the acquisition of Sig. The influence of problem-solving skills and self-efficacy on student learning outcomes is .000 < .050. Testing this hypothesis suggests that there is a significant influence between problem-solving and self-efficacy on student learning outcomes.

Table 11. Determination Test Results (r^2-test)

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.315[a]	.099	.089	1.760
a. Predictors: (Constant), Self-efficacy, Problem Solving Skill				

After testing the hypothesis and establishing that self-efficacy and problem-solving skill significantly impact interest in learning outcomes, the coefficient of determination test is conducted. Table 11 presents the results of the coefficient of determination test. This test is conducted to quantify the extent of the contribution of self-efficacy and problem-solving skill in learning outcomes. Based on the determination test in Table 11, the R2 result is .099, which falls within the range of < .099 < 1, indicating a tendency towards 1. The impact of self-efficacy and problem-solving skill on learning outcomes is 9,9%.

This research was conducted at SMK Negeri 1 Semen, Kediri Regency. The aim of this study was to investigate the impact of problem-solving skills and self-efficacy on students' learning outcomes in skill concentration subjects. The research included four expertise concentrations at SMK Negeri 1 Semen, aiming to provide a comprehensive assessment to better

prepare students for future learning through enhancing their problem-solving abilities and self-efficacy. By emphasizing problem-solving skills, educators can assist students in acquiring the necessary skills for success in the 21st century (Adeoye & Jimoh, 2023). These efforts are anticipated to equip students with strong problem-solving skills and self-efficacy, enabling them to graduate and enter the workforce prepared for professional roles in the business and industrial sectors.

The students in all vocational competencies at SMK Negeri 1 Semen are facing challenges with low problem-solving skills and self-efficacy, which in turn impact their learning outcomes negatively. Self-efficacy plays a crucial role in students experiencing anxiety related to their goals, as their strategies may be perceived as less effective (Pramusinta & Suciati, 2023). To address this issue, this study focuses on providing learning activities aimed at enhancing students' problem-solving skills and self-efficacy across all areas of expertise. Research indicates that high self-efficacy levels are associated with reduced anxiety levels (Ningsih & Hayati, 2020). To improve problem-solving skills, students are presented with problems and given the opportunity to comprehend them. Moreover, encouraging students to seek information allows them to showcase their problem-solving abilities (Treepob et al., 2023).

Once students have a good understanding of the problem, they should create a detailed plan outlining what needs to be prepared and done to solve the problem. They then implement this plan to solve the problem and review their work to confirm that everything has been addressed. This process is beneficial for teachers to track their students' development in problem-solving abilities, particularly for students with low self-efficacy and challenges in managing their learning (Liu et al., 2023).

Likewise, there is a strengthening of self-efficacy. Initially, students were uncertain about their ability to engage in skills concentration lessons. Students gradually enhance their self-efficacy by receiving reinforcement through motivation, being granted the opportunity to independently carry out activities, receiving tasks at a basic level until they can manage them, and progressing to more complex enrichment tasks. The various stages that students have experienced offer positive reinforcement of their accomplishments, boosting their confidence in tackling future challenges. Problem-solving self-efficacy is a predictor of student motivation and test performance (Ramos Salazar & Hayward, 2018).

With the strong confidence that students possess, they will be more prepared to face future challenges, such as taking the final exam, as a demonstration of their academic achievements. Academic self-efficacy and problem-solving self-efficacy are also indicators of anticipated learning outcomes (Ramos Salazar & Hayward, 2018). Students with high self-efficacy demonstrate superior problem-solving skills skills compared to those with moderate or low self-efficacy (Jumiarsih et al., 2022). Those with high self-efficacy exhibit advanced problem-solving abilities, while individuals with low self-efficacy tend to have limited problem-solving skills (Chasani et al., 2022).

The results of this research indicate that problem-solving skills influence learning outcomes, and self-efficacy also plays a significant role in this regard. Both factors have a notable impact on learning outcomes, as supported by Fitriani et al. (2020) and Windiyani et al. (2023). Fitriani et al. (2020) demonstrated the influence of problem-solving skills and self-efficacy on learning outcomes, while Windiyani et al. (2023) established a relationship between student self-efficacy and their problem-solving abilities. Additionally, Sari et al. (2023) found that students with high self-efficacy achieve better learning outcomes compared to those with lower self-efficacy. Prioritizing problem-solving skills can assist educators in equipping students with the necessary skills for success in the 21st century (Adeoye & Jimoh, 2023).

CONCLUSION

Based on the research results, it was concluded that problem-solving skills and self-efficacy significantly impact student learning outcomes in skill competency subjects. This influence is observed on each variable individually and on both variables simultaneously. The

research also demonstrates that problem-solving skills and self-efficacy affect how students learn. Higher self-efficacy levels in students lead to increased confidence in their ability to tackle the challenges within each area of expertise. Consequently, students are more assured in their capacity to attain optimal learning results.

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