

The Relationship of Student Learning Achievement in Engineering Drawings with Software Applications and Building Interior Design at Modeling and Building Information Design Study Program in SMK Negeri 3 Surabaya

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Abstract: Developments in the world of own design allow for increased accuracy and quality, the replacement of manual drawing machines into a digital application that can define what will be built. The research objectives in this article are to (1) determine the level of mastery of learning to draw techniques at SMK Negeri 3 Surabaya, (2) determine the level of learning achievement in the application class with software and building interior design at SMK Negeri 3 Surabaya, and 3) determine the relationship between the level of learning achievement in class engineering drawing subjects and the level of achievement in learning software application subjects. In this research, the research technique is *Ex post facto*, data is collected through tests and documentation, then each variable is characterized using statistical software, namely SPSS version 26.0 for windows, a prerequisite analysis test is carried out. It was decided to do a test. The researcher observed that students who excel in technical drawing and those who excel in software applications are linked by a correlation score of $r_{count} > r_{table}$ ($0.680 > 0.235$) between the two variables. The correlation coefficient value of 46% is a contribution to the success of learning engineering drawing on the learning outcomes of software applications and building interior design. For other quantities determined by values not included in this study.

Keywords: learning achievement result, technical drawing, software application

Abstrak: Perkembangan dalam dunia rancang bangun sendiri memungkinkan peningkatan ketepatan dan kualitas, penggantian mesin gambar manual menjadi sebuah aplikasi digital yang mampu mendefinisikan apa yang akan dibangun. Tujuan penelitian pada artikel ini adalah untuk 1) Mengetahui tingkat ketuntasan belajar menggambar teknik di SMK Negeri 3 Surabaya, 2) mengetahui tingkat prestasi belajar di kelas aplikasi dengan perangkat lunak dan perancangan interior gedung di SMK Negeri 3 Surabaya, dan 3) mengetahui hubungan antara tingkat prestasi belajar mata pelajaran menggambar teknik kelas dan tingkat ketercapaian prestais belajar mata pelajaran aplikasi perangkat lunak. Dalam penelitian ini teknik penelitian adalah *Expost facto*, data dikumpulkan melalui tes dan dokumentasi, kemudian dikarakterisasi setiap variabel menggunakan perangkat lunak statistik, yaitu SPSS version 26.0 for windows dilakukan uji prasyarat analisis. Diputuskan untuk melakukan tes. Peneliti mengamati bahwa siswa yang unggul dalam menggambar teknik dan mereka yang unggul dalam aplikasi perangkat lunak dihubungkan oleh nilai korelasi skor korelasi sebesar $r_{hitung} > r_{tabel}$ ($0,680 > 0,235$) antara kedua variabel. Nilai koefisien korelasi sebesar 46 % merupakan kontribusi terhadap keberhasilan belajar gambar teknik terhadap hasil belajar aplikasi perangkat lunak dan perancangan interior gedung. Untuk besaran lain ditentukan oleh nilai-nilai yang tidak termasuk dalam penelitian ini

Kata kunci: hasil prestasi belajar, gambar teknik, aplikasi perangkat lunak

INTRODUCTION

The industrial era transition and the pace of globalization have an impact on the economy, for example, is undergoing a significant transformation as a result of rapid technological advances, society, media, culture, including education. When it comes to digital technology, we

have entered the era of Industrial Revolution 4.0, which demands skilled people in all-digital technology.

Formal school education that prepares students to develop abilities and creativity for the industrial world is now a Vocational High School (SMK). In this regard, SMK has different characteristics in its learning. Through ongoing curriculum development, it shows tangible evidence of its involvement in creating the best education delivery in Indonesia. Law No. 20 of 2003 mandates vocational secondary education for this purpose.

SMKN 3 Surabaya is one of the providers of formal education, which provides direction, provision, and learning experiences at the vocational secondary level to grow human resources who have a creative and work ethic following each package of expertise programs. So to adjust to the needs in the industrial world, the education provider seeks to create students who will later be ready to work to meet industrial needs in the field they are engaged in.

Developments in the world of the design itself allow for increased accuracy and quality, the replacement of manual drawing machines with an application on a computer that can make it faster, more efficient, and precise is *AutoCAD*.

Especially in the design, modeling and building information department, students must be equipped with field practice, previously students must be proficient in the basic fields of engineering drawing. In the implementation in the field, the language used is drawing, so that students work according to the instructions in the working drawings that are done through the *AutoCAD* application.

Researchers have made previous observations at SMKN 3 Surabaya on drawing subjects with software, the result is that the learning outcomes of students are on average at a minimum completeness score of 75, it is necessary to optimize as an effort to evaluate learning, many factors which play a role both internally and externally.

According to the Ministry of National Education (2008), learning is a process to find out something either knowledge or skills. While the statement from Smaldino, Lowther and Russell (2008) When someone interacts with information and the environment, they acquire information, skills, or attitudes.

Learning outcomes are a real form of achieving educational goals, so the measurement depends on educational goals (Rumini et al., 2003) , while according to Sudjana (2008) , learning outcomes are skills acquired by students as a result of their involvement in educational activities. Accurate and professional educators in these situations should be aware of the factors that influence to the prediction of the symptoms of students struggling to understand the information in educational contexts. Student learning outcomes are influenced by various factors, the most important of which are listed below:

- 1) Internal factors, namely the physical and mental conditions of students
- 2) External factors are the state of the environment around students
- 3) Factors in the learning approach, one of the elements of the learning approach is the way students learn, including learning materials and teaching methods.

Towards the end of the learning process, a teacher conducts an assessment to determine the extent to which pedagogical objectives are met by students by assessing learning outcomes. Bloom claims that the formulation involves cognitive, emotional and psychomotor characteristics that are claimed to be related to one another that cannot be separated from the measurement and assessment of learning outcomes. The element that is most often evaluated in schools is cognitive. The most important aspect of material mastery of the six cognitive aspects is the lowest level aspect, namely the memory knowledge aspect (reminder).

Learning strategy according to Sutikno (2021) is a way of presenting information to students so that the learning process can take place to achieve a certain goal. Different approaches, each with their advantages and limitations, can be used depending on the subject matter being taught. Students of Drawing Engineering subjects and Software Applications at SMK Negeri 3 Surabaya use the following methods:

- 1) The lecture method is often used by educators as the first step in the syntax of learning methods, as well as to introduce the material to be studied and to motivate students.
- 2) The question and answer method is usually carried out after the teacher provides an exercise or introduction to a material to encourage students to grow their minds, draw conclusions, apply and communicate.
- 3) In the demonstration method, students under the supervision of the teacher can take a demonstration approach. Practical classes benefit greatly from this approach because many concepts are difficult to understand unless students have the opportunity to observe firsthand the steps involved in completing an assignment.
- 4) Assignment method, when students are given assignments and review student work, they are asked to practice what has been taught, seek teacher help, and present the results of their work. (Muhibbin, 2010)

Technical drawing is a productive category in SMK that makes students focus on mastering the fundamentals following what is happening in the world of technical drawing. Students are directed to learn how to draw buildings, so students must learn the basic concepts in technical drawings for buildings, which students can then use in the design of the developed drawings. Knowledge of students to draw work on a particular field or paper using a scale and as a means of conveying information to field workers. The software application at SMKN 3 Surabaya uses *AutoCAD software* for computerization from manual drawings. Usually, the teacher gives a stimulus first to get to know *the tools that are on the AutoCAD* interface. The purpose of correctly understanding technical drawing subjects is as an introduction for students to operate the design software application, namely *AutoCAD*. Because drawing is the main component of communication in the world of civil engineering and it is closely related to the two subjects. At SMKN 3 Surabaya, software application lessons with *AutoCAD* to be able to master science and technology in their development encourage students to have significant progress towards industrial needs, with better compatibility. high, then *AutoCAD* can be accepted by all other software or operating systems and can be printed easily in various sizes and shapes. (Nursanti, 2004)

With different layouts and basic skill objectives, students are expected to be able to master the *AutoCAD program* by applying the engineering drafting skills they have acquired. Construction engineering drawings can benefit greatly from a basic understanding of wall, foundation, wood, reinforced concrete, and steel building construction (Suparno, 2008)

The results of daily tests, midterms and end-of-semester exams contained in student report cards reflect the conclusions reached by educators after considering all relevant aspects when evaluating performance in vocational schools. The usefulness of the report card can be stated to show the good or bad student achievement when participating in the learning process.

to improve student learning in the field of software applications and building interior digital design.

To achieve the following research objectives, (1) determine student achievement in engineering drawing subjects; (2) determine student achievement in the subject of software application and building interior design, (3) determine the relationship between learning achievement results in engineering drawing subjects with learning achievement outcomes in APLPIG subjects in the expertise program. Research in this field will focus on learning outcomes in both technical drawing and software applications and building interior design.

METHODS

A method known as *Ex post facto* research was used to investigate the relationship between learning outcomes of engineering drawing and learning outcomes of software applications and

building interior design. This method examines past events to determine what factors may have contributed to those events, all without resorting to treatment and manipulation.

According to Nana Sudjana (2008), *Ex post facto* implies after the fact. Due to manipulation and previous treatment by others, researchers in this study were not required to manipulate or treat the independent variables. Correlational descriptive quantitative research was used to explain the findings.

The time of the research was carried out from May 2021 to completion. The population in this study were all students of Class XI majoring in Modeling Design and Building Information at SMK Negeri 3 Surabaya for the 2019/2020 academic year. Students from two classes totaling 70 people, details can be seen in Table 1. Class XI has studied technical drawing in class X semester 1 and class XI semester 1. Documentation and test procedures are used to collect data depending on the variables studied. There are 2 variables in this study, namely (1) the independent variable, the treatment variable or the manipulative variable to know the effect on the dependent variable. In this study, the independent variable is learning achievement in engineering drawing subjects. (2) The dependent variable, this variable arises as a result of the independent variable or the response to the treatment of the independent variable. In this study, the dependent variable is the learning achievement of software application subjects.

Table 1. Population in data collection

Class	Number of Students
XI DPIB 1	35
XI DPIB 2	35
Total	70

The results of the study were strongly influenced by the way of data collection. Accurate and correct data is the goal of the data collection process. This study uses a data collection strategy based on testing and documentation.

In class XI of SMK Negeri 3 Surabaya, the modeling and building information design expertise program, researchers used daily test scores, Mid-semester and end-of-semester exams to collect learning achievement data in engineering drawing subjects and software applications. students in mastering the subject and fulfilling these competencies

Field data is presented as a description of the data for each variable, both independent and dependent. Data analysis includes the presentation of the mean, median and mode of each variable as well as the frequency distribution in the form of frequency distribution tables, histograms, and trend tables. Researchers use *SPSS version 26.0 for windows* to describe the data that has been collected. So it can be formulated that H_a and H_o are two hypotheses that can be drawn from the explanations that have been discussed:

H_a : "Results of research on students majoring in Modeling and Building Information Design class XI SMK Negeri 3 Surabaya indicate that the level of learning achievement in engineering drawing subjects has a significant and positive relationship to the level of learning achievement in software application and interior design subjects. building".

H_o : " The results of research on students majoring in Modeling and Building Information Design class XI SMK Negeri 3 Surabaya indicate that the level of learning achievement in engineering drawing subjects there is no significant and positive relationship to the level of learning achievement in software application and design subjects. building interiors".

Before the researcher tests the hypothesis, he or she first conducts a prerequisite test to analyze the data to determine the next step in the research, because the data must be tested whether the data taken is distributed normally, or has a linear relationship. To avoid extreme data and do not meet normal or linear assumptions.

RESULT AND DISCUSSION

It is very important to distinguish between independent and dependent variables when analyzing research findings based on previously collected field data. The independent variable here is the student's progress on the technical drawing task while the dependent variable is the student's software application and the progress in building design learning outcomes, to test the relationship between the two variables, the data will be presented in the form of tables and histograms as follows. To obtain maximum results, statistical assistant software is used in *SPSS version 26.0 for windows*.

Variables of Achievement in Engineering Drawing Subjects

After performing analytical tests using SPSS version 26.0 for Windows on the data collected from the participants of this study, we were able to generate Table 2.

Table 2. Description of Engineering Drawing Learning Achievement Results

<i>Engineering Drawing Learning Achievement Results</i>	
<i>mean</i>	81.07
<i>median</i>	81.00
<i>mode</i>	83.00
<i>Std. Deviation</i>	4.07
<i>Range</i>	21.00
<i>Variance</i>	16,560
<i>Minimum</i>	70.00
<i>Maximum</i>	91.00
<i>Sum</i>	5675.0

To calculate the class interval, the formula $K=1+3.3 \text{ Log } n$ is used, where n is the number of research samples. It is known that the value of n is 70, where n is the number of research samples (Nurgiyantoro & Gunawan, 2000) . So that there are many classes of intervals $K=1+3.3 \text{ Log } 70 = 7,088$ rounding to 7 classes of intervals which can be seen in Table 2 and the frequency histogram in Figure 1

Table 3. Interval Class of Engineering Drawing Learning Results

interval	Frequency	Frequency (%)	Cumulative Frequency (%)
70 – 72	2	3	3
73 – 75	22	31	34
76 – 78	16	23	57
79 – 81	13	19	76
82 – 84	8	11	87
85 – 87	8	11	99
88 – 91	1	1	100
Amount	70	100	

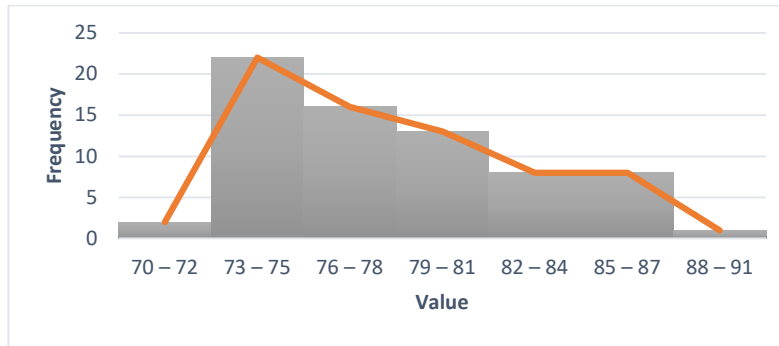


Figure 1. Histogram of Engineering Drawing Learning Results

The tendency of student achievement is determined by the KKM, namely the minimum completeness criteria of 75, the student's mastery scores are divided into 4 categories, namely: very good, good, enough and not enough. After the data is processed, the data can be displayed in Table 3, namely the results of the learning achievement of technical drawing

Table 3. Description of Engineering Drawing Learning Achievement Results

Interval	Frequency		Category
	Frequency	%	
0 – 59	0	0	Not enough
60 – 75	7	10	Enough
76 – 90	62	89	Good
91 – 100	1	1	Very good
Amount	70	100	

The *mean value* (M) of 81.07 lies in the interval 76-90. So from the analysis above it can be concluded that there is no value in the technical drawing variable which is in the less category, the category of mastery learning engineering drawing at SMK Negeri 3 Surabaya is included in the "Good" category because it is in the 76-90 interval range for class XI DPIB students for the 2020/2021 school year.

Achievement Variables in Software Application and Building Interior Design Subjects

According to the results of the analysis test using a statistical assistant program, namely *SPSS version 26.0 for windows*, the data presented in Table 4. can be obtained.

Table 4. Description of Learning Achievement Results of Software Applications and Building Interior Design

<i>Learning Achievement Results of Software Applications and Building Interior Design</i>	
<i>mean</i>	81.04
<i>median</i>	80.00
<i>mode</i>	75
<i>Std. Deviation</i>	5.74
<i>Range</i>	21.00
<i>Variance</i>	33.06
<i>Minimum</i>	75.00
<i>Maximum</i>	96.00
<i>Sum</i>	5673.0

The class interval is obtained by using the formula $K=1+3.3 \text{ Log } n$. Where n is the number of samples used in the study and is known to be 70. The number of interval classes is 7,088 which is rounded up to 7 class intervals, as shown in Table 5 and the frequency histogram in Figure 2.

Table 5. Frequency Distribution of APLPIG Learning Outcomes

interval	Frequency	Frequency (%)	Cumulative Frequency (%)
75 - 77	26	37	37
78 - 80	14	20	57
81 - 83	1	1	59
84 - 86	16	23	81
87 - 89	7	10	91
90 - 92	4	6	97
93 - 95	2	3	100
Amount	70	100	

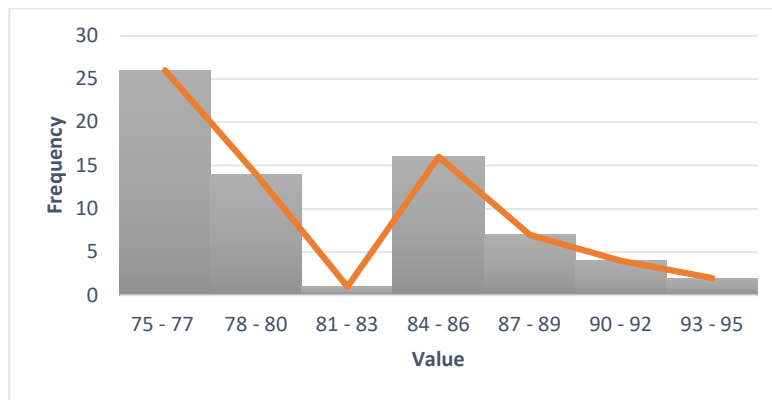


Figure 2. Histogram of Learning Results of Software Applications and Building Interior Design

The tendency of student achievement is determined by the KKM, which is 75, the students' mastery scores are divided into 4 categories, namely: very good, good, enough and not enough. Using this information, it is possible to calculate the level of proficiency in the drawing techniques shown in Table 6.

Table 6. Description of APLPIG Learning Achievement Results

interval	Frequency		Category
	Frequency	%	
0 - 59	0	0	Not enough
60 - 75	7	10	Enough
76 - 90	62	89	Well
91 - 100	1	1	Very good
Amount	70	100	

The *mean value* (M) of 81.04 lies in the interval 76-90. So from the analysis above, it can be concluded that there is no value in the variable drawing application with software that is in the poor category, because it is between the 76th and 90th percentiles for class XI DPIB students for the 2020/2021 academic year, SMK Negeri 3 Surabaya is in the category " good" for the completeness of the learning software application.

The data is ready to be tested for analysis prerequisites before the hypothesis is tested, several conditions must be met through a normal value distribution and the relationship between variables is a linear relationship.

Normality test

Table 7. Discussion of the Normality Test

No	Variable	PCount	Psig	Information
1	X (Technical Drawings) & Y (Software Applications and Interior Designing of Buildings)	0.200	> 0.05	Normal

Normality testing in this study involves a statistical aid program, namely *SPSS version 26.0 for windows* with the nonparametric test *one sample method Kolmogorov Smirnov* test which is summarized in the form of a table presented in Table 7.

The results will be compared with a probability of 0.05 after knowing it (5 percent), the significance value of the residual distribution is declared normal if it meets the requirements, namely the probability coefficient (p) of the test result > 0.05 and vice versa (Algifari & Si, 2003). The following data for normality test results using *SPSS version 26.0 for windows* are presented in Table 8.

Table 8. Normality Test Results with SPSS

One-Sample Kolmogorov-Smirnov Test		
X * Y		Unstandardized Residual
N		70
Normal Parameters	mean	,0000000
	Std. Deviation	4.21553697
Most Extreme Differences	Absolute	,083
	Positive	,083
	negative	-,037
Test Statistics		,083
asymp. Sig. (2-tailed)		,200
a. Test distribution is Normal.		
b. Calculated from data.		
c. Lilliefors Significance Correction.		
d. This is a lower bound of the true significance.		

From the results above, it can be concluded that the two variables have a normal distribution of data.

Linearity Test

The significance value of the linearity deviation in the ANOVA table can be used to conclude linearity. If the significant deviation of linearity value is greater than 0.05 (> 0.05) in the linearity test, then the relationship between variables is considered linear. The data in Table 9 are summarized in the next paragraph. Table 10 shows the results of the linearity test for *SPSS version 26.0 for Windows*.

Table 9. Discussion of Linearity Test

No	Variable	ρ count	ρ standard	Information
1	X and Y	0.201	0.05	linear

Table 10. Linearity test results using SPSS

ANOVA Table						
Y*X		Sum of Square	df	Mean Square s	F	Sig.
Between Groups	Combined	1415.62	17	83,272	5,005	
	linearity	1054.69	1	1054.69	63.385	,000
	Deviation from Linearity	360,934	16	22.558	1.356	,201
Within Groups		865,248	52	16,639		
Total		2280.87	69			

From the results of the linearity test in the table above, it can be concluded that the calculated value is greater than the standard, meaning that the regression direction from the independent variable to the dependent variable is linear.

Hypothesis testing

The purpose of this research is to find a statement that, when viewed from the problems raised by the research, is considered to have real value. To get to this bottom, short-term solutions are devised, which are then tested empirically. This research relies on simple correlation to determine whether the hypothesis is true or not (*product moment*).

There are 2 kinds of hypotheses, namely the alternative hypothesis (Ha) and the null hypothesis (Ho) where the alternative hypothesis (Ha) states that there is a significant relationship between one variable and other variables while the null hypothesis is the opposite. Table 11 shows the test results using the *SPSS version 26.0* statistical assistance application for windows.

Table 11. Product moment correlation test results using SPSS

Correlation			
		X	Y
X	Pearson Correlation	1	,680 **
	Significance. (2-tailed)		,000
	N (Total Population)	70	70
Y	Pearson Correlation	,680 **	1
	Significance. (2-tailed)	,000	
	N (Number of Population)	70	70

Table 12. Discussion of Hypothesis Testing

Sample	Pearson Corellation	Signification	Decision
70	0.680	0.000	Ho is rejected, Ha is accepted

A summary of the discussion of the hypothesis test can be seen in Table 12. The conclusion of the hypothesis test is taken from the significance level, if the significance value is > 0.05 then the null hypothesis (Ho) is rejected and the alternative hypothesis (Ha) is accepted if the significance value is < 0.05 then otherwise.

Based on the Significance Value of Sig. (2-tailed) between the two variables, namely the achievement of engineering drawing subjects (X) with the achievement of software applications and building interior design (Y) is $0.000 < 0.05$ which means that there is a significant correlation between the variables of learning achievement in engineering drawing and achievement learn software applications and building interior design.

Based on the calculated r-value (Pearson Correlation). It is known that the calculated r-value for the relationship between X and Y variables is $0.680 > r_{table} = 0.235$, then there is a significant correlation from the results of statistical analysis using SPSS, it can be concluded that the null hypothesis (H_0) is rejected and the hypothesis (H_a) is accepted. This can be determined through the r table, which refers to Table 13.

Table 13. Correlation Coefficient

Correlation Coefficient Value	Relationship Level
0.00 – 0.199	Very low
0.200 – 0.399	Low
0.400 - 0.599	Currently
0.600 - 0.799	Strong
0.800 - 1.00	Very strong

(Sugiyono, 2013)

The technical drawing correlation value of 0.680 indicates a "strong" relationship between the results of learning achievement in engineering drawing with the results of learning achievements in software applications and building interior design. Looking at the correlation between the two variants obtained from table 12, the results of the correlation are unidirectional (positive). Because the r count or Pearson correlation in this test is positive, it means that the higher the learning achievement of engineering drawing subjects, the better the achievement of software application and interior design subjects in class XI semester 1 at SMK Negeri 3 Surabaya in the academic year. 2019/2020

To find out how much influence the percent variable on learning achievement of engineering drawing and learning achievement of software applications and building interior design have, a coefficient determination test is performed, which can be seen in Table 14.

Table 14. The results of the determination test using SPSS

SPSS Output Summary (Model)				
Model	R	R Square	Adjust R Square	Std. Error of the Estimate
1	,680 ^a	,462	,455	4.24642
a. Predictors: (Constant), X				
b. Dependent Variable: Y				

the independent variable of learning achievement in drawing technique contributes effectively to the dependent variable of software application and building interior design by 46.2%, the remaining 54% is influenced by other variables and factors excluded from this study.

Engineering drawing subjects and software application subjects and building interior design have an average value of 81.04% and 81.07%, respectively, which can be categorized as learning achievements of both subjects in the "good" category. Based on the findings of data analysis. meet the minimum completeness requirements determined by the school of 75. The relationship between learning achievement in engineering drawing subjects with software application subjects and building interior design for class XI at SMK Negeri 3 Surabaya for the 2019/2020 school year shows a "strong" indicator the percentage obtained is 46,2% which means that the technical drawing subject has a positive and significant contribution to the software application and

building interior design subjects. This is evidenced by the results of the calculated r test which reached 0.680. Compared to the r table number with an error rate of 5%, the r table value is 0.235, so the r count is greater than the r table ($0.680 > 0.235$).

With $r^2 = 0.680^2 = 46.2\%$, learning achievement in technical drawing subjects has a significant relationship. The balance of the influence of other variables comes from unobserved factors. As a building science subject, engineering drawing has a great influence on other disciplines, especially in building modeling and information design expertise programs.

Previous research conducted by Akhmad Syaiful Adnan (2016) found a correlation between the topic of engineering drawing and software applications with building interior design subjects with an r -value of $0.54 > 0.2144$. The coefficient of determination r^2 is 29%. Using engineering drawings in software development and building interior designs is beneficial. Consequently, mastery of the basics of drawing is essential if students are to maintain their current level of achievement in the future.

CONCLUSION AND SUGGESTIONS

A student's ability to understand engineering drawings correlates with their ability to use computer software to design building interiors, according to previous research: 1) the results of learning achievement in engineering drawing subjects for students of SMK Negeri 3 Surabaya Class X semester 1 of the modeling and building information design expertise program for the 2019/2020 school year are in the "Good" category with an average score of 81.07, this value has exceeded the KKM, namely by 75; 2) the results of learning achievement in the subjects of software application and building interior design for students of SMK Negeri 3 Surabaya Class XI semester 1 of the building modeling and information design expertise program for the 2020/2021 academic year are in the "Good" category with an average score of 81.04, this has exceeded the KKM, which is 75; and 3) the results of learning achievement in engineering drawing subjects with learning achievement in software application subjects and building interior design for class XI students of the building modeling and information design expertise program at SMK Negeri 3 Surabaya in the 2020/2021 academic year have a positive and significant relationship between the two variables as evidenced by the results of the r test with the SPSS program, obtained a significance value of ($0.00 > 0.05$), the correlation value of r count was $0.680 > 0.235$ r table, it means that r count is greater than r table. The coefficient of determination of 46.2% means that the independent variable of learning achievement in engineering drawing provides an effective contribution to the dependent variable of learning achievement in software applications and building interior design by 46.2%.

According to the researchers, there are suggestions from the results of the study, namely as follows: 1) achievements in the topic of technical drawing and software applications have a good and quite large impact on the achievement of building interior design, so educators are expected to provide understanding to students so that they can get a complex understanding of technical drawing subjects so that for subjects those who are related then can get maximum learning achievement; 2) educators are expected to provide a nurturing and enjoyable learning experience so that students can more easily absorb knowledge. with efforts to improve the achievement of learning outcomes; and 3) learners may benefit from further study of what elements lead to a better knowledge of engineering drawing courses.

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