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# The Effect of Learning Method Schoology Applications and Learning Style on Student Learning Outcomes

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## Abstract

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## 1. Introduction

Education is a way of changing mindsets about life. By education, a person can make decisions about the direction of his journey in life. In the course of his life not only thoughts, but also actions or skills in realizing or solving life problems. A government regulation can run well if there are qualified makers and implementers and supervisors (community). Quality can be interpreted not only smart in terms of theory but also skill. The learning process leads students to have a desire to learn, not to make them smart because every human being has his own intelligence based on intellectual abilities that are born from birth (there are 8 intellectual abilities). Then this learning process helps students develop their skills.

The development of knowledge and skills related to industry can use teaching factory learning. Teaching factory is education that connects factories with training where the campus is made a "pseudo industry" before dealing directly with the real world of industry (Chryssoouris, Mavrikios & Rentzos, 2016). In Indonesia, teaching factory is one of the learning models in vocational education. Graduates of vocational higher education are expected to be able to develop their knowledge in the industrial field. Through teaching factory, it is expected that graduates can meet the needs of industry in terms of workers.

Developing an industry is not easy, because of the many problems faced both from employment, government and customer interest for a long time. Because of that, innovation is needed through creativity and critical mindset of industry, where students are accustomed to creating something that is needed by customers with a variety of creativity / innovation and solving various difficulties through critical thinking. Because teaching factory is based on education, research and innovation, all of which form a triangular relationship. Based on that relationship, it is hoped that there will be innovations which are the results of research that can be applied to education so that graduates are needed by industry.

Whereas one of the 2015-2030 Sustainable Development Goals (SDGs) programs is to increase equity in the quality of education and increase learning opportunities for anyone, which means that anyone including those with low economic life can learn, so that in 2030 there will be no more illiterates (Anna & Esther, 2017), but if the cost of education is expensive then there is a possibility that in 2030 there are still those who have not experienced the world of education.

Not to mention at this time, education began to be directed to the industrial revolution 4.0 related to the use of digital technology or known cyber systems. To start education 4.0, it requires a large cost, which consequently students are also required to provide large costs as well if there is a lack of government attention, because there are still many uses of learning systems in industrial space 3.0 and even are taught with industrial systems 2.0. One way that can be used to reduce the cost burden in terms of education 4.0 is a learning system based on LMS (Learning Management System). LMS is software that contains features needed in the learning process (Almrashdeh, Sahari & Alsmadi, 2011) such as management of user access rights, management of courses, management of teaching materials, activity management, value management, and management of e-learning visualization so that they can be accessed with a web browser. Learning Management System is an infrastructure that provides and manages learning content, identifies and assesses learning objectives, tracks all progress in achieving learning objectives and presents data to oversee the overall learning process (Watson, William R., & Watson, Sunnie Lee, 2007).

The use of LMS allows teachers to manage classes and exchange information with students, as well as access to learning material that takes place within a predetermined timeframe. One LMS is a schoology which combines subject matter with social networks so that it is easy to access. The industrial learning system indirectly directs students to look at cases visually but this does not always make student learning styles toward visual learning styles. Because it will be seen also whether the industry-based learning system makes student learning styles toward the visual.

The benefits of this industry 4.0 revolution are interoperability, transparency of information by creating virtual copies of the physical world by enriching digital factory models and sensor data, technical assistance such as collecting data and making visualizations so that humans can make wise decisions, and independent decisions through the ability of the cyber-physical system so that they can make decisions and tasks as independently as possible. Therefore, education needs to be adjusted towards the industrial revolution 4.0. Education 4.0 is a phenomenon that responds to the needs of the fourth industrial revolution where humans and machines are aligned to get solutions, solve problems and of course discover new possibilities for innovation. Basic education to higher education, adjusting the education curriculum with the challenges and needs of the current era. A curriculum that opens access for millennials to gain knowledge and training to become competitive and productive workers.

High Order Thinking Skills (creativity and critical thinking) are needed in the industry, but not all children can reach this stage, but a good idea can be generated from the collaboration of various student abilities. The way students learn is often referred to as a learning style or student learning modality. Learning styles are a combination of how they absorb, and then organize and process information (DePorter & Hernacki, 2011: 111). Whereas Dunn & Dunn (in Sugihartono, 2007) explained that learning styles are a set of personal characteristics that make learning effective for some people and ineffective for others.

In general, children will find it difficult to process information in ways that are uncomfortable for them. Children have their own learning needs, learn in different ways, and process information in different ways. Some people may have certain dominant learning styles used in various situations, so less use of different learning styles for different situations.

From the explanation above, this journal aims to find out how the influence of the Schoology application learning method and learning style on vocational-based higher learning outcomes and whether there is an interaction between schoology and learning styles. After knowing the results of this study, it is expected that further research can examine various types of student learning styles and other variables such as family conditions and how to unify these types of HOTS leads to industrial-based learning systems.

## 2. Method

This research is a quasi-experimental research type because in order to obtain information that is an estimate that can be obtained with actual experiments in circumstances that do not allow to control and / or manipulate all relevant variables (Suryabrata, Sumadi, 2006). If a population is very large then samples can be taken that can represent a picture of the state of the population. Because the number of student population is more than 400 students and the determination of class of students in the tertiary institution where the study is random, the sample taken using cluster random sampling type. After that, two research classes were obtained, namely a control class consisting of 20 students and an experimental class consisting of 20 students, assuming the characteristics of the two classes were the same as conducting normality and homogeneity tests first, and the two group samples were normal and homogeneous. Variables in a study are circumstances that are manipulated for observation (Best and Kahn, 2007). The variables used in this study are independent variables (Schoology), dependent variables (learning outcomes) and moderator variables (learning styles). This research is to see whether using the schoology application for student learning outcomes is higher than without using schoology. Then it will be seen how the value of students who have a visual, auditory, kinesthetic style and whether the learning style and schoology have interaction. The test used is an essay test because students are given the freedom to elaborate on what they think will, then be given a learning style questionnaire.

To analyze data we need a method or method of analyzing research data so that the resulting report is easy to understand. Data obtained from field descriptions are presented in the form of data descriptions of each variable, both independent and dependent variables. This data analysis includes the presentation of the smallest and largest data, averages, medians, modes, and standard deviations. Furthermore, analysis of variance is performed to see whether there is a relationship between learning methods and learning styles, but before using variance analysis begins by testing the requirements for normality and homogeneity tests.

Normality test data in this study will use the Lilliefors test. Homogeneity test data in this study is to use the Fisher test.

### 3. Result and Discussion

The learning method used in this study is to use a learning application namely Schoology in the experimental class and conventional methods in the control class such as teaching by writing without using any application. The following is a summary of descriptive statistics:

Table 1. Summary of Descriptive statistic

Statistics	A <sub>1</sub>	A <sub>2</sub>	B <sub>1</sub>	B <sub>2</sub>	B <sub>3</sub>
Mean	76,92	71,65	75,29	74,72	73,68
Standard deviation	4,66	6,82	3,95	7,86	6,44
Minimum	70	57	66	57	63
Maximum	90	82	78	90	85,9
Range	20	25	12	33	22,9
Median	76,95	73,5	75,95	75	75
Mode	78	78	78	78	78

A<sub>1</sub> = Experimental Class

A<sub>2</sub> = Control Class

B<sub>1</sub> = Visual

B<sub>2</sub> = Auditory

B<sub>3</sub> = Kinesthetics

After obtaining the results of descriptive data, normality and homogeneity were tested from both group samples. In both the experimental and control group samples using the Lilifors test to see whether the samples were normally distributed, and obtained Lhitung in the control group samples  $0.089 < 0.19$  (Ltable) and Lhitung on the experimental group samples  $0.14 < 0.19$  (Ltable), which meaning that both group samples are normally distributed. Then the variance homogeneity test is performed with the Fisher test, with the results in the following table:

Table 2. Table of Homogeneity

Learning Method	N	Df	S <sup>2</sup>	F <sub>calculation</sub>	F <sub>table</sub>	Hasil
Schoology	20	19	46,56	2,150577	3,03	Homogen
Conventional	20	19	21,65			

From the table it is obtained that the sample variance is homogeneous. When viewed from the learning

method, students from groups taught using Schoology are higher than groups taught in the conventional way. Schoology can be called like a "pocket book", because schoology can now be used on mobile phones, so it can be carried anywhere and used anywhere. Educators motivate students to be diligent in opening the application and storing various data related to the course. As for the conventional method. students tend to have difficulty reading data related to their courses, because vocational education students spend more time in campus, due to the number of hours of practicum more than theory so that if carrying books the bag will be heavy, consequently the time to relearn eye material Certain lectures have little time outside campus hours. This is in line with the results of Murni and Harimurti's (2016) research, that Schoology has a positive influence on learning outcomes. After knowing the learning outcomes of the two sample groups which are higher, it is seen that there are other variables that affect learning outcomes, namely learning style.

Indirectly, the way someone to capture or process information varies, there are those who listen to music, read seriously or have to practice, this is what is called a learning style. One type of learning style is visual, where someone is more dominant using eyes, more sensitive to sound (Hamzah, 2008). Someone who prefers voices such as music, discussion or anything else related to sound is another type of learning style, auditory. Someone who uses the hand as the main recipient of information by applying it through touch is included in the kinesthetic learning style. In this study, indicators of each type of learning style are:

1. Visual

- a. Study in a visual way
- b. Understand well the position, shape, numbers and colors
- c. Neat and orderly
- d. Difficulty in receiving verbal instructions

2. Auditory

- a. Learn by auditory
- b. Good in oral activities
- c. Having sensitivity to music
- d. Weakness in visual activities

3. Kinesthetic

- a. Study with physical activity
- b. Be sensitive to expressions and body language
- c. Like trial and error and less tidy
- d. Weak in verbal activity

From the results of the study, it was obtained that the dominant of 40 students used visuals were 8 students, auditory 11 students and kinesthetic 21 students, with the highest average being visual learning styles (75.29). To see whether there is an interaction between learning styles and learning methods of the Schoology application, an Analysis of Variance Test is conducted with the following results:

Source of Variance	Df	SS	MS	F-calculation	F-table	Conclusion
Learning Approach (A)	2	21,93	10,96	0,37	3,28	Not Significant
Learning Style (B)	1	248,88	248,86	8,39	4,13	Significant
Interaction (AB)	2	56,32	28,16	0,95	3,28	Not Significant
Galat	34					
Total	40					

From the table above it is known that there is no interaction between learning styles and learning methods, but learning styles can affect student learning outcomes. This is because the learning style has been brought from birth, so the learning method only helps educators in making variations of teaching.

From the results of this study indicate that learning methods that use the Schoology application are higher than those not using the application and from 40 sample data it is found that the highest average is students who have a visual learning style. From this research it can be seen that each child is talented. Whatever the child has from birth is good, only the role of parents and educators is needed to direct the children so that they achieve the success of the learning objectives.

#### 4. Conclusion

Every child has unique talents, learning styles and abilities and sometimes differ from one child to another. At the beginning of the study, learning methods were carried out on two different groups where the experimental class using the Schoology application and the control class did not use any application and both sample classes had normal and homogeneous distributed characteristics. Student groups with schoology learning methods have higher learning outcomes. Then the researcher realized that there was a learning style inherent in the students, therefore a learning style questionnaire test was carried out on 40 children. From this study it was found that learning outcomes with a visual learning style were higher than those of auditory and kinesthetic. So an ANOVA test is performed to see if there is an interaction between learning styles and learning methods and the results are not. For the next research students who have visual learning styles can be grouped into two classes, namely the experimental class taught with Schoology and the control class taught without application. Subsequent research can also add other variables so that the



factors that affect student learning outcomes in industry-based tertiary institutions increasingly become apparent.

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