PROCEEDINGS OF THE

EDUCATION RESEARCH Colloquium 2018

BETWEEN

FACULTY OF EDUCATION, UNIVERSITI TEKNOLOGI MALAYSIA (UTM)

& UNIVERSITAS NEGERI MAKASSAR, INDONESIA

UTM
UNIVERSITI TEKNOLOGI MALAYSIA

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Faculty of Education,
Universiti Teknologi Malaysia

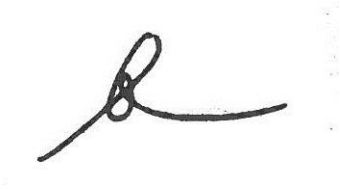
Foreword by the
Dean of Faculty of Education, UTM

Assalamualaikum w.b.t and Good Day

Ladies and gentlemen,

It is my pleasure to welcome you to the Education Research Colloquium between Faculty of Education, Universiti Teknologi Malaysia (UTM) & Universitas Negeri Makassar (UNM), Indonesia. This colloquium is a platform for both institutions to sustain a harmonious and stable global society and to promote international cooperation and exchange. As we know, UTM participated in a wide variety of collaborative relationships with universities, institutions and individuals in many countries. I am confident that through this colloquium, relationship and friendship between FP UTM and UNM will become stronger. I would like to take this opportunity to congratulate all presenters in this colloquium. I am sure that the variety and depth of the research presented at this colloquium will be appreciated by the audiences. In summary, I believe that this colloquium is just a start for a more fruitful and continuous collaboration between FP UTM and UNM.

Thank you



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Effect of Learning Styles on Student Learning Outcomes Course in Statics and Materials Mechanics Subject

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Abstract:

This study aims to explain the effect of learning type on the student's learning achievement in Statics and Materials Mechanics Subject. This study is survey research, with a population of all students active odd semester 2017/2018 who follow the subjects at the Department of Civil Engineering and Planning Faculty of Engineering, Universitas Negeri Makassar. The sample size is 125 people with a significance level of 5%. The research variables are visual learning style (X1), auditory learning style (X2), kinesthetic learning style (X3) and learning the result of Statics and Material Mechanics Subject (Y). Techniques of data collection using questionnaires, interviews, and documentation. The results concluded that there was no significant influence of three kinds of learning style to the learning achievement.

Keywords: visual, auditory, kinesthetic and learning achievement.

1.0 Introduction

Vocational education as part of the national education system plays a very strategic role in the realization of skilled labor. Human resources with high knowledge and skills provide opportunities for the economic growth of a region. Reliable workers can adjust to the dynamics of technological development. Human resources must also have the ability to produce products with quality and price, the ability to compete with products in the global market.

Teachers play an essential role in teaching and learning. Furthermore, the teachers should be able to adapt and adapt their teaching methods to the child's developmental level. Teaching and learning activities do not lie with teachers but how students should also be actively involved in teaching and learning (Hawk & Shah, 2007). Teacher teaching style that adapts to the characteristics of learners shows teachers' perseverance in helping learners achieve learning mastery (Allcock & Hulme, 2010). Although teaching styles of teacher varied from one to another, at the learning process, all teachers have the same goal. A fun teaching style has an impact on improving students' motivation and motivation to learn a subject. Teachers motivate to learn by giving aspirations to students get the expected results. The higher the motivation, the intensity of effort and the effort made to achieve the desired learning achievement will also be higher (Duncan & McKeachie, 2005).

A learning method as delivering knowledge often take different ways. Some students prefer to read the matter from the board, while some students were easy to understand the subject by listening to the verbal information. This is because learners often take different ways to understand original information or lesson (Grainger & Barnes, 2006). Although the lecture method looks conventional, there are still many students who love the learning model that puts the teacher as a speaker. Teachers are expected to tell at length about various

theories with various illustrations, while students listen while describing the content of the lecture in the form of their imagination (Busato, Prins, Elshout, & Hamaker, 2000).

The difference in learning style shows the fastest and best way for every individual to absorb outside information. A person's ability to understand and absorb the lessons is different (Li, Medwell, Wray, Wang, & Xiaojing, 2016). Consequently, a teacher must be able to understand how the different styles of learning students and try to make students aware of the difference. Thus, it is easier for teachers to convey information more effectively and efficiently (DePorter, Reardon, & Singer-Nourie, 1999).

Learning outcomes are a direct result of behavior after going through the process of teaching and learning by the learning material. Individuals in learning have a variety of learning styles, there is student prefer to learn by way of visual (see), there is learning by auditorial (listening), and learning by kinesthetic (move). How to learn learners are diverse is called a learning style (Chania, Haviz, & Sasmita, 2017). Learning style is one crucial aspect in a way that individuals have in absorbing, organizing and processing information received. The appropriate learning style is the key to one's success in learning (Deporter & Hernacki, 2000).

The active learning, learning styles also affect the achievement of learning objectives. Lack of knowledge about learning style is one of the many obstacles faced by learners and educators in the learning process. Thus, it can be concluded that improving the quality of learning is very dependent on the learning style of learners, so by using an efficient learning style and fun, then learners can improve motivation and learning outcomes even though the material taught by educators is quite complicated for them (Gilakjani, 2011).

The results of initial observations in this study, in the curriculum of learning productive and non-productive courses especially on the subject of Statics and Materials Mechanics Subjects there are three learning styles used by students in learning are visual, auditorial and kinesthetic learning styles. However, students are more likely to use kinesthetic learning styles. Subject Statics and Materials Mechanics studied by students in the first semester which is seen from the data of the Department of Civil Engineering and Planning Faculty of Engineering, State University of Makassar students who program the subjects of Statics and Mechanics The material of learning outcomes is less good.

Student learning outcomes are evidenced by the value obtained when programming the subjects of Statics and Materials Mechanics for SI undergraduate programs 2014, 2015 and 2016 which scored poor (E) of 30%. The low learning outcomes of students are caused by various factors, both internal factors and external factors that influence learning outcomes. One of the characteristics of learners that influences the learning outcomes is the learning style. Learning styles with learning outcomes Statics and Mechanics Materials selected as variables to be studied.

2.0 Research Method

This research is survey research. The population in this study is all students active odd semester 2017/2018 as the participants of the Statics and Materials Mechanics Subject at the Department of Civil Engineering and Planning Faculty of Engineering, Universitas Negeri Makassar as many as 175 students. Determination of the number of samples used Harry King

nomogram with 5% significance level so that the number of samples as many as 125 respondents. Sampling using proportional random sampling.

The research variables are visual learning style (X1), auditory learning style (X2), kinesthetic learning style (X3) and learning result (Y). Techniques of data collection using questionnaires, interviews, and documentation. The questionnaire used using a Likert scale. The collected data is further interpreted using descriptive analysis and inferential analysis with the help of SPSS 16.0 program.

3.0 Result and Discussion

Student learning styles are determined by the number of scores obtained from each questionnaire of shared learning styles. Each learning style consists of 7 statements. The highest score of each style statement indicates the learning style of the respondent.

3.1 Description of Learning Style

The results showed that respondents not only have one dominant learning style, but also some respondents have two learning styles, there is even a respondent who can optimize the three learning styles.

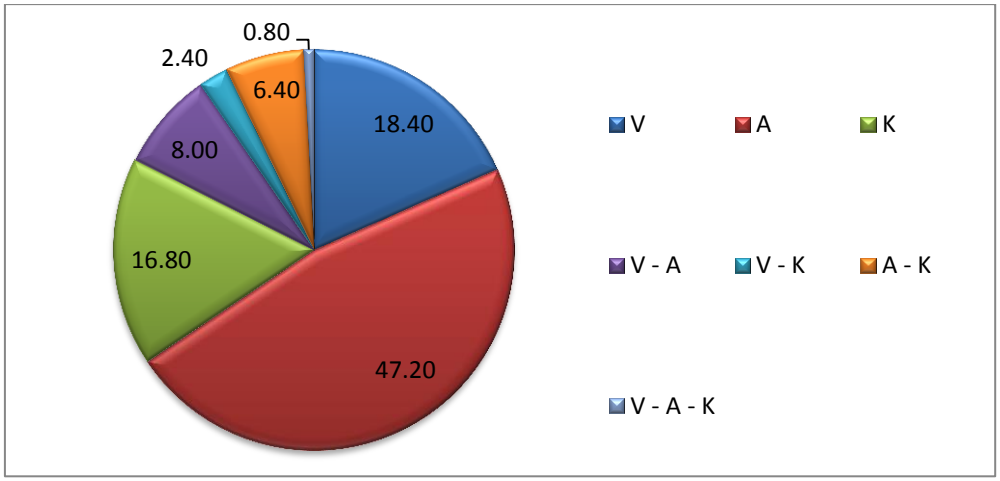

Figure 1: Percentage of Student Learning Styles on Statics and Materials Mechanics

Figure 1 shows that students who program static subjects and dominant material mechanics have auditory learning types (47.20%). Also, there are also respondents who have more than one learning style, even 0.80% of respondents who have all three learning styles. Visual and auditory learning style as much as 8%, auditory and kinesthetic as much as 6.40%, and there are 2.40% students has Visual and Kinesthetic learning styles.

Table 1 shows that male respondents dominantly have learning type of auditory, while female respondents tend to have visual learning styles and kinesthetic, even respondents who can optimize the three learning styles are women. Ames (2003) revealed that there is a difference in the dominance of learning styles of students. The learning styles associated with the student gender. Furthermore, the teacher should desire the student interest to encourage their motivation.

Table 1: Description of the distribution of student learning types by gender

Learning Style	Men (%)	Women (%)	Total
Visual	39.13	60.87	100.00
Auditory	64.41	35.59	100.00
Kinesthetik	19.05	80.95	100.00
Visual - Auditory	30.00	70.00	100.00
Visual – Kinesthetic	33.33	66.67	100.00
Auditory - Kinesthetic	62.50	37.50	100.00
Visual – Auditory – Kinesthetic	0.00	100.00	100.00

Slater, Lujan, & DiCarlo (2007) revealed that there is no significant difference to the presentation of information. Although not significantly different, the female student population tended to be more diverse than the male population, which included a combination of broader sensory in their preference profiles. Therefore, instructors need to be aware of these differences and extend the range of their presentation styles.

Other studies have shown that there is a difference between the preferred learning methods by female and male students, mathematical achievement, and their attitudes toward mathematics. Achievements and attitudes toward mathematics subjects are not dependent on gender. Female students most like Convergent learning styles, while most male students love the Assimilator learning style. However, none of the students chose the Accommodator learning style in both groups. (Orhun, 2007)

3.2 Learning Achievement Description

The result of the respondent's learning is obtained from the result of study result document from the head of the study program. The complete will be described as follows:

Figure 2: Student's Mastery Learning on Statika dan Material Mechanic Course

Figure 2 shows that respondents who have visual learning styles are fewer passes when compared to other learning styles, while students with kinesthetic learning styles have a graduation rate of 92%. The subjects of statics and materials mechanics focus on reasoning and load analysis. This emphasizes on the optimization of the ability to see and hear the explanation of lecturers so that the material can be understood well. When the visual and auditory learning styles are optimized, then the student graduation rate can be higher.

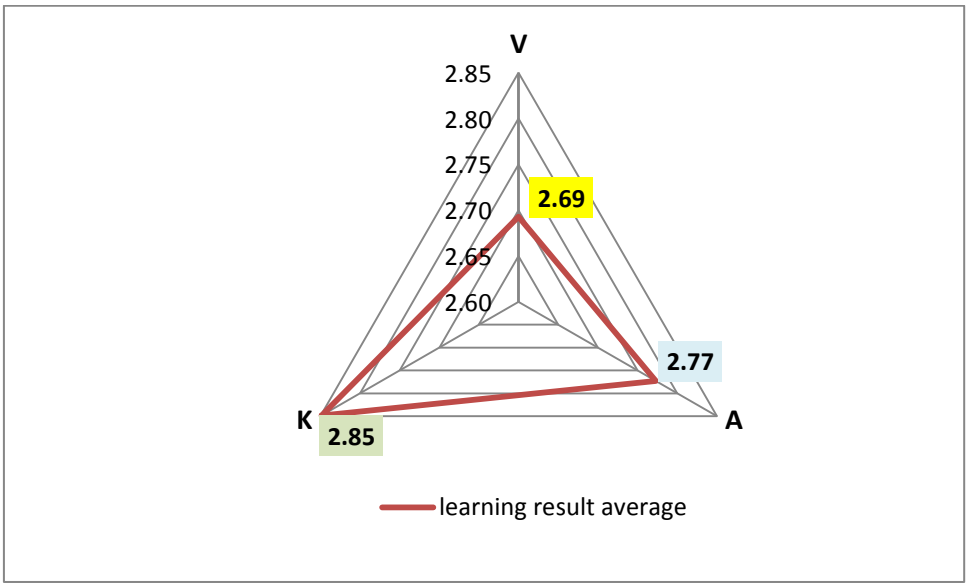

Figure 3: Student's Grade Performance Achievement Vs. Learning Style of Students

Figure 3 presented data that the average learning outcomes of respondents with Kinesthetic learning style is higher than others, while the lowest learning outcomes are in respondents who have a Visual learning style.

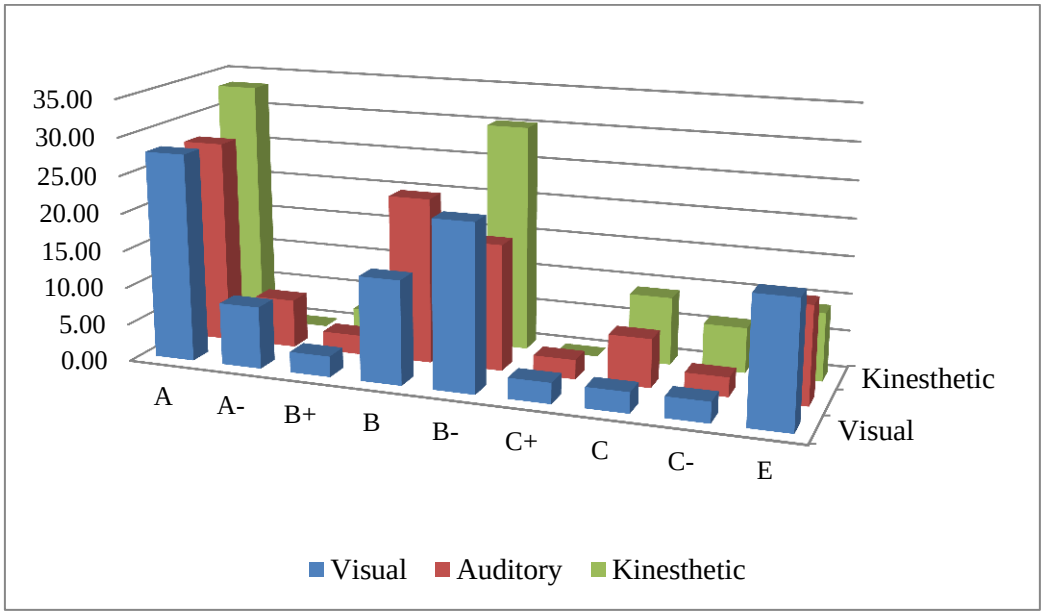

Figure 4: Student's Learning Result

The values of "C-" and "E" are grades not graduated in the subject. Figure 4 shows the distribution of respondents' values based on their learning styles. From the graph, it can be

seen that kinesthetic learning style is more in the value of "A," "B-," and "C." Also, at the value of "C-" kinesthetic learning style is also more. Visual learning styles and auditory learning styles spread almost all levels of assessment, but the visual learning style has the greatest percentage of the "E" score which is one of the grades not graduating in the static course.

3.3 Hypothesis testing

Hypothesis test resulted in the relationship between student learning style (X) with learning result (Y) with the help of SPSS (Statistical Package for the Social Sciences) 16.0 for windows program. Before performing hypothesis testing, the research data must satisfy the requirements analysis test. The results of the requirements analysis test are presented in Table 2.

Table 2: Test requirements analysis of learning types

Variables	Probability (ρ)		
	Normality	**Linearity**	**Homogeneity**
Visual	.184	.240	.201
Auditory	.138	.061	.492
Kinesthetik	.426	.798	.961

Testing of data normality with probability value (ρ) for Visual learning type is higher than significance value 0.05. Thus, it can be concluded that all data is normally distributed. In linearity test, it can be seen that all the test results of variables of Visual, Auditory, and Kinesthetic learning type of linear on student learning outcomes. The significance level was less than the probability value. While homogeneity testing shows that the probability value (ρ) is higher than the significance value 0.05. The variable data type learning Visual, Auditory, and Kinesthetic was homogenous.

Hypothesis testing was done using inferential analysis using simple regression. The effect of one independent variable on the dependent variable. The criterion used is based on probability value. Also, the decision making can also be done by comparing the tcount value with the ttable. The result of simple linear regression analysis of the independent variable to the dependent variable is presented in Table 3.

Table 3: Simple Regression Analysis

No.	Variable	r-parsial	Contribution (%)	T_{count}	ρ	N	t_{table}
1	$X_1 \rightarrow Y_1$	0.475	22.60	1.938	0.061	36	2.032
2	$X_2 \rightarrow Y_2$	0.258	6.60	0.079	0.937	77	1.992
3	X_3 t$\rightarrow Y_3$	0.136	1.90	1.009	0.321	33	2.039

Based on Table 3, it can be explained that the correlation coefficient of variable visual learning type (X1) was 0.475 marked positive, probability value 0.061> 0.05 while t_{count} 1,938 $<t_{table}$ 2.032. The result indicated that the variable type visual learning does not give positive effect to variable student achievement.

The correlation coefficient of variable of auditorial learning type (X2) was 0,258 with positive sign, probability value was 0.937> 0.05, while t_{count} 0.079 <t_{table} 1.992. The result indicated that variable of the type of auditorial study did not have a positive influence on student achievement variable.

The correlation coefficient of kinesthetic learning variable type (X3) was 0.136 positive sign, probability value 0.321> 0.05, while t_{count} 1.009 <t_{table} 2.039. The meaning of analysis that kinesthetic learning type variable does not give positive effect to student achievement variable.

These results indicate that the three learning styles namely visual, auditory, and kinesthetic do not give influence to student achievement. This is different from the results of research (Gilakjani, 2011) which explains that the improvement of learning quality is very dependent on the learning style of learners, so by using an effective learning style and fun, then learners can improve motivation and learning outcomes, although materials taught by educators quite complicated for them.

4.0 Conclusion

Based on the results of the analysis, the conclusion of the research was:

1. Student learning style in Statics and Material Mechanics dominantly have type learning Auditory. Also, there were also respondents who have more than one learning style. The dominant male respondents have to learn Auditory, while female respondents tend to have visual learning styles and kinesthetic
2. Visual learning styles are fewer passes when compared to other learning styles, while students with kinesthetic learning styles have a graduation rate of 92%.
3. Visual, auditory, and kinesthetic learning styles do not affect student achievement.

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