



## Meta-Analysis Of the Effect of Learning Style on Student Learning Outcomes

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*This study presents the results of research on the results of the influence of learning styles on learning outcomes. The research method used in this study is a meta-analysis method. The research method is quantitative. In this study, the sample used is ten relevant articles. For data collection using observation techniques, namely data collection techniques carried out through direct observation of articles. The results of the study on the influence of learning styles on learning outcomes obtained show the effect size value is 0.755, which means that there is an influence of learning styles on student learning outcomes. For the influence of learning styles based on learning materials, static fluid material has a high effect size and based on education level, at the high school level has a large influence between learning styles and student learning outcomes.*

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## INTRODUCTION

The development of an increasingly sophisticated era today demands the existence of highly qualified human resources or human resources that can be used for the needs of the nation and state. To equip themselves to produce quality resources, namely positive learning education. It is hoped that through education, especially at the secondary school level, we can have quality human resources that can improve the quality of life.

Education has a significant role in improving human resources and efforts to realize the ideals of realizing general welfare and the intellectual life of the nation. In the field of education, the challenge felt so far is the difficulty of improving the quality of education, so that the efforts made by the government in the field of education always lead to the improvement of the teaching system and subject matter, as is the case with the government's efforts to improve and refine the curriculum which includes the contents of the curriculum. the subject matter, learning objectives, or methods of teaching.

The teaching and learning process is the core of educational activity in schools, one of the principles in implementing education is that students are active in carrying out these educational activities because the teaching and learning process is an interactive activity between the teaching and the learning parties, namely the interaction between the teacher and students. The learning process is said to be good when the process can generate effective learning activities to get maximum learning outcomes. Maximum student learning outcomes can be seen from how students' learning styles in class during the teaching and learning process.

Learning is a process which makes someone (Akhmad Suyono,2018). In every learning process, as educators, teachers play a role in helping students to learn well and easily. In the learning process, not only teachers play a role, but students also play a role or try to find information, solve

problems, and express their opinions. Learning implies that there are learning and teaching activities, where those who learn are students and those who teach are teachers, who oriented to the development of knowledge, attitudes and skills of learners.

According to Khoeron, 2014 says that learning style or learning style is a way for students to react and use the stimuli they receive during the learning process. According to Adi Nugroho, 2016 learning style is a combination of students absorbing information and then organizing and processing that information. According to Adhy Pujianto, 2020 when the learning process takes place if the teacher pays attention to student learning styles, it can make the learning process easier and more effective [1].

From this understanding, it can be concluded that a person's learning style varies according to the student's habits in absorbing, organizing and processing the information provided by the teacher. In studying a subject matter students often assume that it is a difficult job to do, unpleasant and boring. This can be seen from the lack of response and attention from students when the teacher is explaining the learning material in the classroom [2]. The habit of students in class is to just come, sit, listen and be quiet. If this situation continues, the teaching and learning process is only carried out in one direction, that is, it is only carried out by the teacher while the students are silent. Meanwhile, in the teaching and learning process in the classroom, there is a need for interaction between teachers and students, where the interaction between teachers and students is when the teacher explains or conveys the material, the students respond to what is explained by the teacher. In the learning process, interaction between students can also be done as students want to discuss the material presented by the teacher in order to respond to problems that arise during the learning process [3].

When a person learns, he or she includes his entire being which during the learning process takes place not only the brain works but also the feelings when a person learns. This is done so that during the learning process can be more concentrated [4]. When the learning process lasts for a long time, usually students will feel tired easily so they are not able to learn optimally. In addition, students have not been able to recognize their respective learning styles so that learning becomes less than optimal, so that the learning outcomes achieved by students are not optimal. To overcome this, a teacher should be able to recognize and know the characteristics of students, because when the teacher understands the characteristics of students well, the teacher will be easy to adjust the learning methods used which of course greatly affect the success of the students' learning process [5].

According to Jumroidah, 2018 learning outcomes are the result of an interaction between the act of learning and the act of teaching. Meanwhile, according to Latuconsina, learning outcomes are changes that are obtained by someone after carrying out the process of learning activities. Learning outcomes are the final results of the learning process [6]. Learning outcomes are the limits obtained by students in understanding the learning material. Good learning outcomes can reflect that there is a good application of learning styles because knowing and understanding the best learning styles for themselves will help students in the learning process so that their learning outcomes will be maximized.

Based on the explanation above, learning style is one of the important roles of students in applying how to learn or how to understand learning materials so that the learning outcomes obtained are more optimal [7]. The objectives to be achieved in this study are the first to determine whether learning styles can affect student learning outcomes, the second goal to determine the effect of learning styles based on learning materials, the third objective to determine the effect of learning styles on learning outcomes based on the type and objectives. fourth is to determine the effect of learning styles on student learning outcomes in terms of the level of education of students.

## RESEARCH METHOD

The research method used in this study is a meta-analysis method. In this study, the method is to analyze articles that have been developed previously. The meta-analysis method is quantitative which in this method analyzes data using numbers. In this study, the sample used was ten relevant articles. And the data used is also obtained from the ten articles. For data collection, it uses observation techniques, namely data collection techniques carried out through direct observation. Direct observations on ten articles that became the research sample. Instruments In this study, an observation sheet instrument was used which was equipped with data coding (coding). Coding is necessary for processing research data. In coding, the provision of certain codes for each data includes giving categories for the same type of data. For the data analysis process, it uses the calculation of the effect size value, which uses the following equation:

$$Es = \frac{\bar{x}_{eks} - \bar{x}_{kon}}{sd_{kon}} \quad (1)$$

$$Es = \frac{\bar{x}_{post} - \bar{x}_{pre}}{sd_{pre}} \quad (2)$$

with effect size criteria:

effect size  $\leq$  0.15 negligible

0.15 < effect size  $\leq$  0.40 low effect

0.40 < effect size  $\leq$  0.75 medium effect

0.75 < effect size  $\leq$  1.10 high effect

1.10 < effect size  $\leq$  1.45 very high effect

## RESULTS & DISCUSSIONS

From the results of observations made on the results of ten relevant articles. Student learning outcomes. This study uses ten relevant articles which will be analyzed later.

**Table 1.** Distribution of Data Distribution of the Effect of Learning Style on Student Learning Outcomes

No	Journal Code	Effect Size	Category	Average Effect Size
1.	J1	0,73	Medium	<b>High</b>
2.	J2	0,82	High	
3.	J3	0,79	High	
4.	J4	0,85	High	
5.	J5	0,69	Medium	
6.	J6	0,62	Medium	
7.	J7	0,65	Medium	
8.	J8	0,81	High	
9.	J9	0,73	Medium	
10.	J10	0,86	High	
<b>Total</b>		<b>7.55</b>		

In this study, to see the influence between learning style and student learning outcomes, the data analysis process used the calculation of the effect size, which in this study obtained the effect

size value in a range of values from 0.62 to 0.86. The highest effect size value obtained is a value of 0.86 when viewed from the size of the effect size, this value can be reported on a high effect measure, this result is supported by the results of research by Adi Nugroho, et al (2016) which states that the influence of learning styles on learning outcomes greatly affects learning outcomes. Because in his research, classes that apply learning styles to their learning processes have much more optimal learning outcomes compared to control classes [8]. From the research, the effect size value was also obtained, which is a medium criterion size. Which means that the influence of learning styles on learning outcomes has an influence ,not too extreme.

**Table 2.** Data Distribution of the influence learning styles of learning outcomes in terms of learning materials.

No.	Material	Code Journal	Effect Size	Average effect size	Category
1.	Motions of object	J6	0,62	0,62	Medium
2.	Changing Shape	J7	0,65	0,65	Medium
3.	Size and Measurement	J3	0,79	0,79	High
4.	Work	J8	0,81	0,77	High
5.	Work	J1	0,73		
6.	Momentum	J5	0,69	0,69	Medium
7.	Static fluid	J9	0,73	0,73	Medium
8.	Static Fluid	J4	0,85	0,85	High
9.	Sound Wae	J2	0,82	0,82	High
10.	Heat	J10	0,86	0,86	High

For the second table, regarding the influence of learning styles on learning outcomes in terms of physics learning materials or physics science, material that has a large learning force influence is on heat learning materials. Because in this material, if the application of the learning style is carried out, it will make it easier to understand the learning material [9]. This is also explained by Gunawan (2016), namely, students in understanding, and mastering a material concept or learning is influenced by the learning style of the learner [10].

**Table 3.** he distribution of data on the influence of learning styles on learning outcomes in terms of the type of learning style.

No	Learning Style	Journal Code	Effect Size	Average Effect Size	Category
1.	Visual	J3	0,79	0,766	High
		J4	0,85		
		J7	0,65		
		J8	0,81		
		J9	0,73		
2.	Auditory	J2	0,82	0,84	High

No	Learning Style	Journal Code	Effect Size	Average Effect Size	Category
		J10	0,86		
		J1	0,73		
3.	Kinesthetic	J5	0,69	0,68	Medium
		J6	0,62		

The influence of learning styles on learning outcomes is reviewed in terms of the type of learning style, there are five articles whose learning styles are predominantly visual, two articles on auditory learning styles, and three articles on kinesthetic learning styles. From the article obtained the dominant learning style is the visual learning style [11]. Because the learner in learning often sees his friend first and then he also does the same thing

**Tabel 4.** Data distribution of the influence of learning styles on learning outcomes in terms of education level

No	Level of Education	Journal Total	Average effect size	Category
1.	Elementary School	2	0,635	Medium
2.	Junior High School	3	0,776	High
3.	Senior High School	5	0,79	High

In the fourth table, the influence of learning styles on learning outcomes is based on the level of education. It can be seen in the results that it is known that the junior high school education level, has a higher size effect compared to other levels of education [12]. Which has a side effect of 0.79 which is categorized as high. This means that during the high school level, students better understand their learning style so which later will affect the learning outcomes or achievements of students.

## CONCLUSION

Based on the results and discussions carried out, it can be concluded that: The application or use of learning styles during the learning process has a positive impact on student learning outcomes. The application of learning styles during the learning process greatly affects the achievement of student learning outcomes. The application of learning styles to students has a great influence of 0.755 (high) on student learning outcomes.

The influence of learning styles on student learning outcomes in terms of learning materials, heat learning materials have a great influence where the effect size is worth 0.86 which is categorized as high. The influence of learning styles on student learning outcomes is in terms of type. The visual learning style (seeing) has a great influence, where learners are more inclined to see friends or the environment in the learning or learning process.

The effect of learning style on learning outcomes based on education level. At the high school education level, the influence of learning styles on learning outcomes is the effect size of 0.79 which is in the high category. This means that at the high school level students better understand their learning style so that later it will affect learning outcomes or student achievement.

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