



## Correlation between Assertive Teaching Styles of Physics Teachers and Learning Outcomes of High School Physics Students

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**Abstract:** This research is ex-post facto research that aims to determine the correlation between assertive physics teachers' teaching style and physics learning achievements of high school students in Kabupaten Soppeng. The population in this research were students of XI MIPA in SMA Negeri in Soppeng, while the samples based on Proportional Random Sampling technique was 269 students. The research instrument was Teaching Style questionnaire and archive documentation of students' grades recap. Validation of the instrument using Gregory validity test, empirical validation and reliability test. The results showed the physics teacher used assertive teaching style with 85.50% while the student learning achievements were in high category with average of 86. From the analysis product moment correlation test results, the r-count value was 0.276 which was greater than the r table, 0.138 at a significance level of 5% thus the conclusion was assertive teaching style of physics teachers affects students' physics learning achievements.

**Keywords:** teaching style, assertive teaching style, learning outcomes

**Abstrak:** Penelitian ini merupakan penelitian ex-post facto yang bertujuan untuk mengetahui ada tidaknya hubungan antara gaya mengajar asertif guru fisika terhadap hasil belajar fisika peserta didik SMA di Kabupaten Soppeng. Populasi dalam penelitian ini adalah seluruh peserta didik kelas XI MIPA di SMA Negeri se-Kabupaten Soppeng, sedangkan jumlah sampel berdasarkan teknik Proportional Random Sampling adalah 269 peserta didik. Instrumen penelitian berupa kuisioner Gaya Mengajar dan dokumentasi arsip rekap nilai peserta didik. Validasi instrumen menggunakan uji validitas Gregory, validasi empirik dan uji reliabilitas. Hasil penelitian menunjukkan guru fisika menggunakan gaya mengajar asertif dengan persentase sebesar 85,50% sedangkan hasil belajar peserta didik berada pada kategori tinggi dengan rata-rata 86. Dari analisis hasil uji korelasi product moment diperoleh nilai r hitung 0,276 yang lebih besar dari r tabel yaitu 0,138 pada taraf signifikansi 5% sehingga disimpulkan bahwa gaya mengajar asertif guru fisika berpengaruh terhadap hasil belajar fisika peserta didik.

**Kata kunci:** gaya mengajar, gaya mengajar asertif, hasil belajar.

### ▪ INTRODUCTION

Every human being needs education throughout his life, since a person was born, then education is also needed for growth and development. Educational activities are carried out through a learning process that involves interaction between educators and students, in this case, teachers and students. Law No. 14 of 2005 concerning Teachers and Lecturers Article 1 explains that teachers are professional educators with the main task of educating, teaching, guiding, directing, training, assessing, and evaluating students in early childhood education, formal education, basic education, and secondary education.

Learning is a fundamental part of our life that is essentially based on personal experience, practice, abilities, and approaches. It has long been recognised that the learning progress is greatly influenced by the learning style students apply, and that successful teachers utilise methods which correspond to the particular teaching style for their students (Mašić, Polz, & Bećirović, 2020). A teacher certainly needs various ways in order to increase the knowledge of his students. Therefore, the teaching process of a teacher requires a teaching style. The teaching style of a teacher in the classroom will show the main characteristics of the teacher as an educator. The nature of a teacher in his teaching style will show the teacher's attitude towards students. Interested students will pay attention to the teacher's teaching style and even imitate it, this can make students understand well the material presented by the teacher. This is likely to affect the learning outcomes of these students.

Based on initial observations related to the teaching style of physics teachers at several public high schools in Soppeng, the data obtained that teachers at the time of teaching physics in fact have their own methods and methods as well as their respective traits, this is what the author assumes as a teaching style, but the majority of physics teachers They are still unfamiliar with the term teaching style so that they do not know for sure what type of teaching style they use when teaching physics in class. Based on the results of these observations, the authors want to know the categories of teaching styles applied by Physics teachers at State Senior High Schools in Soppeng Regency when learning physics based on and which teaching styles are actually effective for learning physics based on Sue Cowley's theory of teaching style.

Teaching style is a combination of the type of teaching that is unique to each teacher, the teaching behavior consistently shown by the teacher in the teaching-learning process and their knowledge of pedagogy, behavior in teaching. classes, preferred teaching methods, beliefs and needs (Grasha, 2002). Meanwhile, according to Thoifuri (Thoifuri, 2007) in his book being the initiator teacher suggests that teaching style is a form of teacher appearance when teaching, both curricular and psychological. A curricular teaching style is a teacher teaching that is tailored to the objectives and nature of certain subjects. Psychological teaching style is teacher teaching which is adjusted to student motivation, class management and evaluation of learning outcomes.

Every person has particular distinctive styles of thinking, preferences and ways of doing things which influence their behavior. In an educational environment, teachers' personal qualities and the attitudes that they employ in their teaching refer to their teaching styles. Teachers with an expert teaching style have the knowledge that students need and are concerned with transmitting correct information to students. Teachers with a formal authority style are considered an expert in their field of study. Being the center of the class, they emphasize an acceptable standard, provide positive and negative feedback, establish learning goals for students, and supervise students with critical views towards standard practices and procedures. (Stankovska, Braha, & Pandiloska, 2020).

The teacher's teaching style has the same goal, namely conveying knowledge, shaping student attitudes, and making students skilled in their work. Thus, teachers need special abilities in teaching, namely the use of teaching variations (Male, Ansar, & Arwildayanto, 2021). Teaching style is the way or form of a teacher's appearance in imparting knowledge, guiding, changing or developing the abilities, behavior and

personality of students in achieving the goals of the learning process. Thus, the teaching style of the teacher is an important factor in determining the success of the student learning process. The choice of teaching style becomes an important thing for the achievement of educational goals (Muthmainnah, 2018).

Ali (2010) stated that the teaching style possessed by a teacher reflects on the way of carrying out teaching, according to his own views because each individual works in his own unique way. Teachers' teaching styles evolve over time. In addition, the psychological foundation, especially the learning theory that is held and the curriculum implemented, also colors the teaching style of the teacher concerned. The teaching style of the physics teacher referred to in this study is all the behavior, attitudes and actions taken by the physics teacher in carrying out teaching activities, especially with regard to his face, facial features, eyesight, voice and movements that are seen in each of his actions as personal radiance when teaching physics in the classroom. According to Sue Cowley (2011) there are three teaching styles carried out by most teachers, including passive, aggressive and assertive teaching styles. These three teaching styles by Sue Cowley are classified based on the nature of a teacher in the class he leads during the teaching and learning process. Passive teaching style is the teaching style of a teacher who tends to be more silent, not innovative and even tends to be monotonous in his class, a teacher with a passive attitude can bring students who are active also become passive because of their nature.

The aggressive teaching style is the opposite of the passive teaching style. If in the passive teaching style the teacher does not move much and tends to be silent, on the contrary in the aggressive teaching style the teacher moves too much and even talks too much compared to guiding students to be active in learning. The general characteristic of teachers with aggressive teaching styles is a bad temper. Assertive teaching style is the most suitable teaching style to be delivered by a teacher. Teachers with an assertive teaching style are able to control the class well. Assertive teaching style is an ideal approach to effective behavior management.

The teaching style falls within a boundary between passive, assertive and aggressive, with the assertive style being an ideal approach to effective management of teaching behavior. The effectiveness of the assertive teaching style is proven in this study by looking at its relationship with learning outcomes. Learning outcomes are a measure or level of success that can be achieved by a student based on the experience gained after an evaluation in the form of a test and is usually manifested by certain values or numbers and causes cognitive, affective, and psychomotor changes (Sudjana, 2009).

Learning is a process of gaining interest in knowledge, skills, habits and behavior. Learning is an effort to acquire habits, knowledge and attitudes. Efforts made by someone who learns to acquire various habits, knowledge and attitudes above are carried out in certain ways, so that the obstacles found in the learning process can be overcome so that it causes a change in him in reacting to the learning situation he is experiencing. If the learning situation is in line with expectations, then there will be more or less changes in him both in behavior, behavior and psychomotor (Lestari, 2015). Learning outcomes are basically an ability in the form of new skills and behaviors as a result of practice or experience. Learning outcomes reflect the objectives at a certain level that have been achieved by students (students) which are expressed by

numbers or letters. Learning outcomes are used to determine the level of success of a teaching and learning process or to determine the level of success of a teaching program. The level of success of the learning process at school is symbolized by numbers or letters. Furthermore, according to Sudjana, learning outcomes reflect the goals at a certain level that have been achieved by students (Andriani & Rasto, 2019).

Physics learning outcomes are the abilities achieved by students after receiving the physics learning experience by the teacher. The results of this study are student scores in the form of student evaluation scores covering the cognitive domain (science) in Basic Competence (KD) 3.4 in Physics subjects in class XI MIPA, namely the subject matter of Fluid Laws. This material is determined based on the results of initial observations at each research location by considering the time of the study and the extent to which physics learning has taken place in all schools that are research locations.

Studying physics is not only concerned with formulas, numbers and operations, but physics is also concerned with ideas, structures, and their relationships which are arranged logically so that physics is related to abstract concepts. Physics is concerned with abstract ideas that are given symbols that are arranged hierarchically and the reasoning is deductive, so learning physics is a highly mental activity. Learning physics is essentially a high mental activity to understand the meaning of structures, relationships, and symbols, then apply the resulting concepts to real situations, causing a change in behavior (Hasan, Palloan, & Ali, 2011).

Several factors that affect the process and learning outcomes include factors from outside (external) and factors from within (internal). External factors consist of environment and instruments. The internal factors consist of physiological and psychological. Based on the factors that influence the learning outcomes, there are external factors, one of which is the instrument. The instrument factor has a teacher in it that can affect student learning success. Therefore, teachers are advised to make changes in teaching styles so that students can easily understand the subject matter given (Nurjanah & Adman, 2018).

## ▪ **METHOD**

### **Research Desain**

The type of research used by the researcher is of ex post facto research, namely research that obtains data by not giving treatment to the sample being studied and only taking data from a symptom that has occurred. The design of this research is a simple design consisting of one independent and dependent variable each, namely the teaching style of the physics teacher acting as the independent variable (X) or the independent variable and Physics Learning Outcomes which act as the dependent variable or the dependent variable (Y).

### **Participants**

The population is the entire object that is the target of a study where the population in this study are students of class XI MIPA at SMA Negeri in Soppeng Regency.

**Tabel 1** Research population

School	Number of Students Class XI MIPA Academic Year 2021/2022
SMAN 1 Soppeng	193 people
SMAN 2 Soppeng	170 people
SMAN 3 Soppeng	84 people
SMAN 4 Soppeng	24 people
SMAN 5 Soppeng	127 people
SMAN 6 Soppeng	74 people
SMAN 7 Soppeng	101 people
SMAN 8 Soppeng	26 people
<b>Total</b>	<b>799</b> people

Source: [dapo.kemdikbud.go.id](http://dapo.kemdikbud.go.id)

The sample is a representative or part of the population under study where the sample also part of the number or characteristics possessed by the population (Arikunto, 2007). Determination of sampling error depends on the level of accuracy or sampling error tolerated by the researcher. The error rate commonly used in research is 5% (0.05). To determine the sample size of the research population, the Slovin formula is used as follows:

$$n = \frac{N}{1 + ne^2} = \frac{799}{1 + 799 (0,05)^2} = 26$$

Therefore, the number of samples in this study is a minimum of 266 students of class XI MIPA in SMA Negeri in Kabupaten Soppeng.

The sampling technique used is Proportional Random Sampling, which is a sampling technique where all members have the same opportunity to be sampled according to their proportions, large or small population (Sugiyono, 2010). The basic formula for calculating the sample in this study is as follows:

$$ni = \frac{Ni}{N} \times n$$

Keterangan:

- ni = Number of samples per school
- Ni = Number of populations per school
- N = Total Population
- n = Total sample size (Slovin's formula)

Based on the Proportional Random Sampling calculation formula above, the number of samples in this case is class XI students at each Senior High School in Kabupaten Soppeng in a row, namely: SMAN 1 Soppeng as many as 65 students, SMAN 2 Soppeng as many as 57 students., SMAN 3 Soppeng as many as 28 students, SMAN 4 Soppeng as many as 8 students, SMA 5 Soppeng as many as 43 students, SMA 6 Soppeng as many as 25 students, SMA 7 Soppeng as many as 34 students and finally SMA 8 Soppeng as many as 9 students. Based on these details, the total number of samples in this study was 269 students.

## Research Instrumen

### *Questionnaire*

Questionnaire is literally interpreted as information from the respondent in the sense of a report about his personality, or things he already knows. Suharisimi Arikunto (2007) suggested the types of questionnaires when viewed from the way of answering them, namely open questionnaires and closed questionnaires. When examining the variables contained in this study, the type of questionnaire used is a closed questionnaire. This is based on the researcher's consideration that the physics teacher's teaching style variable to be studied in this study concerns the physics teacher's personal and natural disposition when teaching. By using a Likert scale, the variables to be measured are translated into variable indicators with an answer scale of Strongly Not Appropriate (STS) to Very Appropriate (SS) with an answer score range of 1-5 scale.

The questionnaire referred to in this study is a list of written statements given to respondents in this case are high school students majoring in science to obtain information about teaching styles for physics teachers in all public high schools in Kabupaten Soppeng. The validity test carried out on the questionnaire is instrument testing by experts or what is known as the Gregory test and empirical validation. The Gregory test is carried out by two experts in their field, where the results of the test will then be cross tabulated and analyzed to determine the level of instrument reliability. While the empirical validation consists of two steps, namely the validity test and the reliability test.

The results of the Gregory test from the teaching style questionnaire obtained a relevance value equal to 1 (one), or it can be written  $R_{count} > 0.7$  so that it can be stated that each item of the instrument can be used for the next stage. Furthermore, of the 60 items that deserve to be distributed to 30 students of class XI MIPA 5 and XI MIPA 6 SMA 1 Soppeng who are also the research population. The results of the validity test showed that 4 items of the instrument were declared "Not Valid" with details of 1 item of assertive teaching style, 2 items of passive teaching style and 1 item of aggressive teaching style. The results of the reliability test state that the instrument is reliable with a high level of reliability at a reliability value of 0.857. There are 56 valid statement items, then 10 items are selected by the researcher with a maximum score of 50 for each teaching style so that there are a total of 30 items that are included in the final questionnaire which will be distributed to students who become the research sample.

### *Documentation*

Documentation instrument is a form of archiving of a research variable. The documentation referred to in this research instrument is data in the form of scores of high school students majoring in Mathematics and Natural Sciences at KD 3.4 subject matter of Fluid Laws obtained from each physics teacher concerned.

## Data Analysis

This research is quantitative research that processes data in the form of numbers to answer the formulation of the problem in research. The two kinds of statistics used in this study are descriptive statistics and inferential statistics. Descriptive statistics to describe or provide an overview of the object under study through sample or population data as it is, without analyzing and making conclusions that apply to the public

(Sugiyono, 2010). The descriptive analysis used is quantitative descriptive analysis, namely the analysis of teaching style scale data to determine the tendency of physics teacher teaching style.

Inferential Statistics is a statistical technique used to analyze sample data and the results are applied to the population. This statistic will be suitable for use if the sample is taken from a clear population, and the sampling technique from that population is done randomly (Sugiyono, 2010). The inferential statistics carried out in this study were the normality test, homogeneity test, and linearity test as a prerequisite test before the Pearson product moment test was carried out. Overall statistical analysis in this study was carried out by researchers using data processing applications in the form of Ms. Excel.

The data normality test was conducted to see whether the research data came from a normally distributed population or not. The normality test was carried out by researchers using the Kolmogorof Sminorf (K-S) test at a significance level of 5% with the test criteria being  $|F_t - F_s|$  the largest  $<$  Kolmogorof Sminorf table value, it can be stated that the instrument variable is normally distributed (Kasmadi, Sunariah, & Siti, 2013). In this study, normality tests were carried out for both variables, namely Teaching Style of Physics Teachers (X) and Physics Learning Outcomes (Y). After the data is declared normally distributed, then the homogeneity test is then carried out. The homogeneity test aims to show that two or more groups of sample data come from populations that have the same variance (homogeneous). The homogeneity test is also part of the statistical analytical prerequisites. The homogeneity test aims to carry out tests on the equality (homogeneity) of several samples. After being declared homogeneous, the last prerequisite test is carried out, namely the linearity test. The linearity test aims to determine whether two variables have a linear relationship or not. This test is one of the requirements of the correlation test or linear regression. The linearity criterion is if the price of Sig  $<$  0.05, it can be stated that the two variables are linear (Kasmadi et al., 2013).

When the three pre-requisite tests have been met, the hypothesis test of the research can be carried out. The hypothesis of this research is that there is a significant relationship between the assertive teaching style of physics teachers and the physics learning outcomes of Senior High School students in Kabupaten Soppeng. To prove the hypothesis of this study, the Pearson product moment correlation test was conducted. Hypothesis testing in this study uses manual calculations with the Product Moment correlation formula because this technique can determine whether or not there is a correlation between two variables. After knowing the correlation value, the next step is to provide an interpretation of the correlation coefficient or "r" Product Moment.

The degree of correlation between the independent variable and the dependent variable can be determined by testing the coefficient of determination. The coefficient of determination or also known as r squared ( $r^2$ ) is used to measure the extent to which the independent variable can explain or explain the dependent variable. If the value of the correlation coefficient is known, then the coefficient of determination can be obtained by squaring it. The value of the coefficient of determination is expressed in percent

▪ **RESULT AND DISSCUSSION**  
**Teaching Style of Physics Teacher**

The results of the descriptive analysis were obtained by scoring students' answers to each statement item. The score for each teaching style is calculated according to the previously separated items. The results of these scores will be compared to determine whether the physics teacher has an assertive, passive, or aggressive teaching style. The comparison results obtained were analyzed with descriptive statistics as follows. Based on the results of the classified research, it was found that from a total of 269 students who became the research sample, 230 of them stated that their physics teacher used an assertive teaching style so that it could be stated that the assertive teaching style was more dominant than other teaching styles. These results are obtained from the comparison of the percentages of each teaching style, namely the assertive teaching style of 85.50%, the passive teaching style of 6.32% and the aggressive teaching style of 8.18%.

After being expressed in percent, it is seen that the percentage value of assertive teaching style is more dominant than other teaching styles. The number of students who classify the teaching style of their physics teacher into an assertive teaching style for each school can be seen in the following table.

**Table 2** Phisycs teachers' assertive teaching style

School	Number of Students
SMA 1 Soppeng	58
SMA 2 Soppeng	56
SMA 3 Soppeng	28
SMA 4 Soppeng	5
SMA 5 Soppeng	31
SMA 6 Soppeng	17
SMA 7 Soppeng	31
SMA 8 Soppeng	4
<b>Total</b>	<b>230</b>

The results showed that of the three teaching styles studied, the dominant students classified their teachers in an assertive teaching style. However, some of the students also considered the teacher to be assertive or aggressive depending on how the students viewed the teacher's demeanor while delivering physics lessons. Teaching style is the combination of the type of teaching peculiar to each teacher (Kalyon, 2020). Teaching styles can also be defined as the ways the teacher takes towards teaching (Durmus & Güven, 2020). The existence of various classifications of teaching styles is in accordance with the statement of Muhammad Ali (2010) which states that there are so many teaching styles such as so many teachers, because each individual works in his own unique way in which the teacher's teaching style will develop over time. Where teaching should not be a process of delivering learning material, or providing as much stimulus as possible to students, but rather seen as a process of regulating the environment so that students learn according to their abilities and potential. Teachers who have an attractive teaching style and are liked by students will be able to bring students to obtain maximum learning achievement (Triumiana & Sumardi, 2016).



Some teachers choose a teaching style that is suitable to their personality, their thinking styles and they think it is the best. But not for themselves, teachers should also use teaching styles that appeal to students' different personalities, needs and teaching styles that arise from these differences. Because teaching styles are the leading factors that shape the teaching-learning process and have the most important part in achieving students' success. It is very important for teachers to use different teaching styles, taking into consideration the individual differences of students to provide high quality education (Apaydin & Cenberci, 2018).

The teaching style of the physics teacher is obtained from the students' opinions on the teacher's behavior and demeanor while teaching physics. Class XI students from SMA Negeri 1 Soppeng to SMA Negeri 8 Soppeng stated their physics teacher teaching style through instruments that had been prepared by the researchers. Based on the research results that have been described previously, that the results obtained are that the assertive teaching style is more dominant than the passive teaching style and the aggressive teaching style with a percentage of 85.50% so that it is stated that the teaching style of physics teachers in SMA Negeri in Kabupaten Soppeng tends to be a teaching style. Assertive in line with the research results, Sue Cowley (2011) states that the teaching style is within a boundary between passive, assertive and aggressive with the assertive teaching style being the most ideal approach for the most effective teacher management.

### **Physics Learning Outcomes**

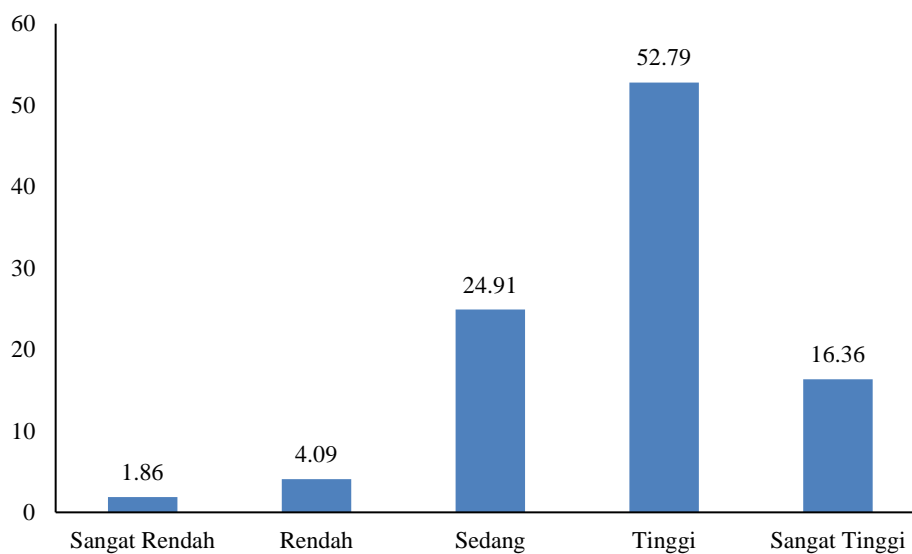
Research data related to students' physics learning outcomes were obtained by researchers using the documentation method through the archive of students' scores recap on the subject matter of Fluid Laws at KD 3.4 with a KKM (Minimum Completeness Criteria) score of 75. To obtain the archive, the researcher does not teach, but obtains a score from the evaluation that has been carried out by the physics teacher concerned so that the archive is owned by the physics teacher of class XI MIPA from every public high school in Kabupaten Soppeng. Learning outcomes data that can be seen in full in the attachment of physics learning outcomes.

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standard and 6 other students were declared complete at KD 3.4 for the material on fluid laws.

Based on these details, it is known that from a total of 269 students who became the research sample, there were only a total of 9 students who did not achieve the KKM score. From the results of descriptive statistical analysis obtained an average value of 86.41. Where based on the results of data processing, it is known that students' physics learning outcomes are divided into five intervals according to five level categories, where the highest frequency is 142 students at intervals of 85-92. The frequency has a percentage of 52.79% and is in the "High" category. The next category of physics learning outcomes is shown by a bar chart that looks like the following picture.

Research data results explain that from a total of 269 students who became the research sample, only 9 students did not achieve the KKM score. Based on descriptive statistical analysis obtained an average value of 86.41. Data on Physics Learning Outcomes of Class XI MIPA Students of Soppeng Regency SMA students were then calculated as a whole from SMA 1 Soppeng to SMA 8 Soppeng and presented in the form of frequency distribution tables, category tables, and bar charts of learning outcomes. Based on the results of the data processing listed in the table above, it can be seen that the physics learning outcomes of students are divided into five intervals according to the category level chemistry, where the highest frequency is 142 students at intervals of 85-92. The frequency has a percentage of 52.79% and is in the "High" category. The table for the category of physics learning outcomes is then shown by a bar chart that looks like the following picture.



**Figure 1.** Category of physics learning outcomes

The product of an effective teaching process carried out by a teacher to students in the form of increasing students' knowledge related to the material being taught in accordance with the definition of learning outcomes put forward by Nurjanah & Adman (2018), namely learning outcomes as something that students can do previously. cannot be done as a reflection of student competence. Data on student learning outcomes

obtained by researchers in the form of numbers from the assessment of each physics teacher on the evaluation of the abilities of their students. This is in line with the opinion of Sudjana (2009) which states that learning outcomes are a measure or level of success that can be achieved by a student based on the experience gained after an evaluation in the form of tests and is usually manifested by certain values or numbers and causes cognitive changes, affective and psychomotor.

Learning outcomes which is Variable Y in this research is Physics Learning Outcomes. Physics Learning Outcomes of Students in this study were obtained from the recap archive of physics teacher grades at KD 3.4 with the subject matter of Fluid Laws. Based on the results of research that has been processed with descriptive analysis, it is found that the physics learning outcomes of all students are at an average of 86. This is already above the KKM value of 75 so it can be stated that the majority of students' scores have exceeded the KKM threshold value. As for the category of Student Learning Outcomes as variable Y, it is at the level of the "High" category with a percentage of 52.79% in accordance with the results of descriptive analysis compiled to obtain a frequency distribution which is then developed into a table for the category of physics learning outcomes as shown in table 4 The preparation of learning outcomes categories is based on the opinion of Sudjana (2009) which states that student learning outcomes are classified on several criteria depending on the quality of their learning outcomes.

The Relationship of Physics Teacher Teaching Style with Physics Learning Outcomes. The main purpose of the implementation of this research is to determine the relationship between the teaching style of physics teachers as variable X and learning outcomes of physics as variable Y. To determine the relationship between these two variables, the Pearson Product Moment correlation test was conducted. However, before carrying out the correlation test, there are several conditions that must be met so that several tests are carried out before the correlation test, namely the normality test, homogeneity test and linearity test.

The results of the normality test on the X variable, namely the physics teacher teaching style score, obtained the normality test results  $|F_t - F_s|$  the largest  $<$  The value of Kolmogorof Sminorf's table on the approach of  $n = 200$  which is  $0.048275 < 0.096$  with  $= 0.05$  then it is stated that the physics teacher teaching style score is normally distributed. Similar to teaching style scores, the data on physics learning outcomes scores where the value of  $|F_t - F_s|$  the largest  $= 0.0755$  which is also smaller than the value of Kolmogorof Sminorf's table, it is stated that the student learning outcomes scores are normally distributed. Thus, it can be stated that the two variables in this study are normally distributed.

The homogeneity test was carried out using the F test at a significant level ( $\alpha$ ) of 0.05. The results of the homogeneity test obtained that the price of  $F_{count} = 1.14235$  while the price of  $F_{table} = 1.223$  which means  $F_{count} > F_{table}$  so that it can be stated that the physics teacher teaching style scores and physics learning outcomes came from a homogeneous population. The results of the linearity test in the ANOVA table with analysis using the Ms. Excel application obtained a significance value  $= 0.013$  which is smaller than 0.05 or  $0.013 < 0.05$  so it can be stated that the two variables are linear. Then all prerequisite tests are met, the next step is a correlation test to determine the correlation between two variables. In this analysis, the author uses the product moment

correlation formula, which is the analysis used to find the magnitude of the correlation between two variables, in this case the assertive teaching style of the physics teacher and student learning outcomes.

After the data was analyzed using the product moment correlation technique, the calculated  $r$  value was 0.276. The criteria for stating that there is a correlation between two variables is if  $r$  count is greater than  $r$  table at a significant level of 5%. The value of  $r$  table number of respondents between 200-299 with a significant level of 5% is 0.138. When compared with  $r$  arithmetic, it can be seen that  $r$  arithmetic  $>$   $r$  table so that it can be stated that there is a correlation or relationship between the two variables. This relationship is significant and positive. To show the extent to which the contribution of the independent variable can explain the dependent variable, an  $r$  squared inferential analysis (coefficient of determination) is carried out. The coefficient of determination in this study is used to determine the extent to which the teaching style of physics teachers can affect student learning outcomes in each school. The calculation of  $r$  squared in this study is assisted by the Ms. Excel data processing application.

Based on the analysis that has been done, it is known that the value of the coefficient of determination from each school is different and classified as varied and even has a much different difference between one another. The author assumes that this is also influenced by the number of samples studied from each school. The highest coefficient of determination is in SMA 8 Soppeng with a determination value of 52.62 or a correlation of 0.5264, this value is a fairly large value which indicates a strong correlation. Based on this value, it can be stated that the diversity of the independent variables 52.62% is able to explain the diversity of the dependent variable. The remaining 47.38% is influenced by other variables outside the research variables. Other variables that affect learning outcomes do not necessarily come from the teacher, no doubt these variables also come from the students and their learning environment. This is in accordance with the results of research which states that teachers teach on the one hand and students on the other. Both of them show a balanced activity only in different roles (Yulvinamaesari & Khaeruddin, 2013)

After going through the data analysis stage, the final conclusion which is also the purpose of the implementation of this research is to find out the relationship between the Assertive Teaching Style of Physics Teachers and the Learning Outcomes of Class XI MIPA Students at SMA Soppeng Regency where the final results show that there is a relationship between the two. Where the relationship is in accordance with Sukardi's statement which is also supported by the results of research conducted by Saleh et al. (2017) with his statement that the teaching style of teachers and student learning styles are two things that are interrelated, support each other and determine the level of success of the teaching and learning process. These results are in line with research in 2019 which concluded that the teaching style of lecturers has an effect on student academic achievement (Chetty et al., 2019). Learning styles have profound effects on material processing, exercises designing, teachers' instruction options and performance assessments (Zhou, 2011).

Assertive teaching style has a relationship with students' physics learning outcomes on fluid laws. Thus the results obtained from this study. Assertive teaching style is the most ideal teaching style used by a teacher, including physics teachers. Some of the characteristics of the assertive teaching style proposed by Sue Cowley (2011)

include the teacher being consistent about learning, being flexible and willing to re-explain the material and provide case examples related to the student environment. These characteristics are very suitable to be applied when teaching fluid laws material.

That is stated because the fluid laws are the initial material that will be the benchmark for the success of the next material, namely static and dynamic fluids, so a consistent attitude from a teacher is needed. In addition, fluid is a material that requires illustrations, demonstrations or practicum so that providing examples of fluids related to the student's environment is certainly able to increase students' understanding of the material being taught which of course can improve learning outcomes. This is in accordance with the study which states that Physics have important qualities for the students in the understanding of daily life and natural events in science. These qualities result from the spread of a wide range of subject areas of physics. For example; some topics like mechanics, optics, electricity and thermodynamics are directly related to daily life events and simplify the students' understandings (Çetin, 2016).

Based on the results of research conducted at eight public high schools in Soppeng Regency with a total sample of 269 students of class XI MIPA obtained data regarding the relationship between the assertive teaching style of physics teachers and physics learning outcomes. The correlation test was carried out after conducting prerequisite tests on the research data, namely normality test, homogeneity test and linearity test where the results showed that there was a relationship between the assertive teaching style of physics teachers and physics learning outcomes. Based on data analysis using inferential statistical analysis, namely product moment correlation analysis, the calculated  $r$  value of 0.276 is greater than the  $r$  table so that it can be stated that there is a significant correlation or relationship between the two variables studied. Thus, it is stated that the research hypothesis is accepted. While the results of the analysis of the coefficient of determination ( $r$  squared) show that the value of the coefficient of determination from each school is different and classified as varied and even has a much different difference between one another. The author assumes that this is also influenced by the number of samples studied from each school

Based on the results of the inferential analysis related to the relationship between the Assertive Teaching Style of Physics Teachers (X) and the Physics Learning Outcomes of Students (Y) there is a positive correlation. The better the teaching style of the physics teacher, the higher the physics learning outcomes obtained by the students. This result is different from the results of a previous study conducted by Erinc Karatas and Yalin in 2014 which concluded that there was no significant relationship between the teaching style of an educator and the academic achievement of his students. This difference may be due to the fact that the respondents of the research (Karataş & Yalin, 2021) are undergraduate and postgraduate students even though they use the same type of instrument, namely the questionnaire.

The instrument used in this research is a closed questionnaire that uses a Likert scale to state the results. This instrument is the right instrument to use, but it is possible that there are deficiencies in the data acquisition process carried out by the researcher. The results of the questionnaire obtained may be less accurate due to the respondents' answers which may be difficult to measure the level of trust/honesty. Another thing that is also likely to cause less accurate answers given by students is their reluctance to give opinions about their own teachers so that students tend to choose the appropriate option

on statements that are considered good (positive) where positive statements are characteristic of an assertive teaching style. This is what is likely to cause the assertive teaching style to become dominant. In addition, the lack of interest in literacy of students towards a fairly long questionnaire statement can also affect the assessment given by students. This is in accordance with the opinion of Putranta & Jumadi (2019) which states that the longer students' interest in literacy decreases.

The questionnaire that was distributed to students was in the form of a google form, which in addition to containing questionnaire statement items, also contained messages and students' impressions of the physics learning they felt. This is what underlies the researcher stating in the previous paragraph that there is a possibility that students are reluctant to give an assessment of their teacher. From the message form and impressions, the researcher found several sentences with almost the same intent, namely statements from students that they felt tense or afraid because of the monotonous nature of the teacher and lack of interaction with students or being easily angry. If understood further, these two things are characteristics of the passive and even aggressive teaching style proposed by Sue Cowley (2011), but looking back at the questionnaires filled out by students, their opinions remain dominant in the assertive teaching style, herein lies the weakness of this study.

When teachers fully understand these teaching styles, they can select effective strategies and create learning environment that are most likely to improve students' memory and retain more information (Payaprom & Payaprom, 2020). Competent teachers will be better able to create an effective, fun learning environment and will be better able to manage their classes so that students do not feel tense and learning outcomes can be more optimal. A teacher must be able to manage teaching and learning interactions, he must be able to understand the nature of learning, the factors that influence learning activities, how the learning process takes place and the characteristics of understanding, feelings, interests, values, and skills. Thus, he will be able to determine the style of class leadership that will be used. This will affect the style of interaction between teachers and students in teaching and learning activities. Teaching styles are important for achieving teaching objectives (Fernández & Espada, 2021).

The job of educating or teaching is a job that requires certain abilities. This ability can be seen in his ability to carry out his role as an educator or teacher, mentor and so on. Interesting and good learning is expected to achieve optimal learning objectives. The process of learning physics we made more attractive and thus contributing to the acquisition of competences defined by the school curriculum (Holubova, 2015). One way to make learning interesting is to use variations so that students do not get bored and students pay attention to what is conveyed by the teacher so that they understand and understand, thus educational goals can be instilled in students. Therefore, in line with the opinion of Thoifuri (2007), if a teacher has a good teaching style, the learning outcomes of students will also be better.

## ▪ **CONCLUSION**

Based on the results of research that has been carried out by researchers at public high schools in Kabupaten Soppeng, regarding the relationship between the assertive teaching style of physics teachers and physics learning outcomes, the authors conclude that the teaching style of high school physics teachers in Soppeng Regency tends to be

an assertive teaching style where the learning outcomes of physics students in class XI MIPA SMA Negeri has an average of 86 and is in the High category. Based on the analysis that has been done, it is also concluded that there is a significant relationship between assertive teaching style and student learning outcomes.

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