THE RELATIONSHIP BETWEEN AUDITORY LEARNING STYLES AND PEER INTERACTIONS WITH MATHEMATICS LEARNING INTEREST SMAS STUDENTS HOPE STEM ATTACKS

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Abstract

To improve student learning achievement, a solution is needed that can increase enthusiasm and foster student interest in learning while in class to participate in teaching and learning activities and can influence students in obtaining satisfactory results. One solution that can be done to overcome the problems that have been identified is to use external factors, namely peer interaction and internal factors which include factors that exist in students, namely students' auditory learning styles. This study aims to analyze and determine the relationship between auditory learning style and peer interaction with the learning interests of Harapan Batang Serangan Private High School students. This research belongs to the type of quantitative research, the method used is descriptive correlational type. The research sample was 183 students of class X and XI of Batang Serangan Private High School. Research data was collected using a research scale that was declared valid and reliable. The data analysis technique uses two predictor regression analysis. The results showed that: (1) there is a significant relationship between auditory learning style and learning interest, with a probability value of $0.03 < 0.05$; (2) there is no significant relationship between peer interaction and learning interest, with a probability value of $0.06 < 0.05$; (3) there is a significant relationship between auditory learning style and peer interaction with interest in learning mathematics at Harapan Batang Serangan Private High School, with a probability value of $0.04 < 0.05$.

Keywords: *Auditory Learning Style, Peer Interaction, Interest in Learning Mathematics*

1.INTRODUCTION

Education is a program. A program that involves a number of components working together to achieve the programmed goals. As a program, education is a conscious and intentional activity that is directed to achieve a goal. Knowing whether the program organizers can achieve their objectives effectively and efficiently, it is necessary to evaluate. Evaluation is carried out on the components and work processes so that if there is a failure in achieving the goal, the components and processes that are the source of failure can be traced (Purwanto, 2011). Although it is recognized that education is a major long-term investment that must be organized, prepared and provided with facilities and infrastructure in the sense of substantial material capital. But currently Indonesia is still struggling with a classic problem, namely the quality of educators. The quality of education here also includes the quality of learning and one of which can be seen from the achievement of student learning. SMA is a secondary education level that prioritizes the preparation of students to continue higher education with specialization (Depdiknas, 2004). The embodiment of this specialization is in the form of holding majors starting in class X namely, majors in MIPA, Social Sciences, and Language and Culture. High school education level starts from Class X to class XII with students who are generally 16-18 years old. High school graduates are prepared to continue their education to the next level. However, not all high school graduates are in line with the existing authority. There are still many high school graduates who do not go on

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Eka Puji Safitri, Hasanuddin, Suaidah Lubis

to college or choose to work, even for women who have graduated from high school and immediately marry.

Harapan Batang Serangan Private High School is one of the formal education institutions in Indonesia located in Langkat district, North Sumatra Province, which provides general education at the secondary education level as a continuation of junior high school, MTS or other equivalent forms. Harapan Private High School is under the auspices of the Ministry of Education and Culture, which has a MIPA and Social Sciences expertise program. Harapan Private High School students are required to take specialization or expertise programs starting from class X. One of the common subjects at the high school level is Mathematics. All students need Mathematics to meet practical needs, and solve problems in everyday life, for example being able to calculate content and weight. As Indonesian citizens who are entitled to education as stipulated in the 1945 Constitution, must have minimum general knowledge. The minimum knowledge includes Mathematics. Every learning process activity carried out in formal education, the goal is that the learning carried out obtains maximum results. This is not simply obtained easily because to obtain maximum learning results cannot be separated from several factors. One factor is the learning activity of the students themselves, in this case the auditory learning style used by each student. Learning styles are key to developing performance at work, at school and in interpersonal situations. Learning styles can be easily described as people understand and remember information (Ghufron and Risnawita, 2014). Sukadi (2008), auditory learning style is a learning style by listening.

Activating students in learning activities is one way to animate and train students' memory so that it can work and develop optimally. In addition, the way to activate students in learning is to provide a variety of meaningful learning experiences for students' daily lives by providing problem solving challenges, giving assignments or homework, familiarizing students to be aware of the importance of learning which is a necessity of their life. Teachers need to provide learning that can require active students because each student has a different type of learning style. Therefore, each student needs different tutoring services so that students can develop according to their level of ability. Someone in general will find it difficult to process information in a way that is uncomfortable for them because everyone has their own learning needs. Therefore, everyone's learning needs are different as is everyone's learning style. It can be said that the learning styles possessed by students have a tendency of different learning styles in absorbing information. Learning style is a combination of how a person can absorb, organize, and process information. Each student in following the learning process has its own learning style. Sometimes there are students who take part in the learning process only by listening, and there are also students who take part in the learning by monotonously noting what the educator teaches. This is done so that the material or material being studied can be processed and absorbed properly, so this can have an impact on the better the learning outcomes of these students. Then the learning process cannot be separated from one of the learning objectives, the learning objective is so that the learning outcomes of students can be better and maximized.

According to Ghufron and Risnawita (2014), in general it is assumed that learning styles refer to personalities, beliefs, choices, and behaviors that are used by individuals to assist in their learning in conditioned situations. Optimizing the learning style possessed by students can be done several things according to the type of learning style, including:

1) Visual Student; display interesting pictures and concept maps during learning, encourage students to read at a glance and then after getting a general idea of the material to be studied, then enter the details or details

2) Auditory Students; repeat material that is considered important by using rhythmic intonation of voice, using media in the form of biology learning videos that have sound effects

3) Kinesthetic Student; designing a learning model that makes students more active such as project-based learning, demonstration methods and practicum.

705

International Journal of Social Science, Educational, Economics, Agriculture Research, and Technology (IJSET)
E-ISSN: 2827-766X | WWW.IJSET.ORG

Peer interaction has the potential to cause changes to other individuals in the peer group. The emergence of changes experienced by other individuals can have positive and negative impacts. The positive impact is in the form of a treatment that contains goodness and benefits, provides interesting information, supports to become a good person, and is valuable. While the negative impact is in the form of treatment that is inversely proportional to the positive impact which of course will have a bad effect on each individual, such as brawls, fights, smoking and so on. Peers can also provide support for joint activities and assistance. Peers greatly affect each individual. The time that a teenager has is mostly spent outside the home with teachers and peers. Many adolescents cannot filter well the impact of peer interactions on their peers. So that peer interaction can plunge a teenager into negative things, such as loss of interest and enthusiasm for learning so that he is late for school, skipping classes. So that peer interaction has a big effect on student learning interest. This negative impact keeps teenagers away from the ideals that should be achieved and can also reduce interest in learning. Not only that, as a result of this the individual can grow into a deviant personality

Based on the results of the researchers' initial observations at Harapan Batang Serangan Private High School, by directly interviewing the Mathematics teacher and directly observing the learning process. When interviewing the Mathematics subject teacher, the teacher said that the most important problem was that the results obtained by students in Mathematics were still low when compared to the results of student achievement in other subjects, so remedials were often carried out to improve student achievement. Then the relationship with students' learning interest in mathematics is still low and there is no learning style that has an impact will make students become bored in learning, marked during the teaching and learning process in class there are many students when learning Mathematics are less enthusiastic about Mathematics, and during learning in class students are often sleepy, then when the teacher asks questions, it seems that students are not interested in answering. In addition, the interaction between students is also not good, students tend to prefer solving their own problems rather than asking for help from friends. The teacher's role is very important to guide students to always interact with friends, because usually students are more comfortable expressing their problems to their peers than the teacher. Students tend to prefer solving their own problems rather than asking for help from friends. The teacher's role is very important to guide students to always interact with friends, because usually students are more comfortable expressing their problems to their peers than the teacher. Students tend to prefer solving their own problems rather than asking for help from friends. The teacher's role is very important to guide students to always interact with friends, because usually students are more comfortable expressing their problems to their peers than the teacher.

Interest is a psychological factor that is present in everyone, so that everyone can have an interest in certain things/activities. If someone is interested in something then interest will appear. From this understanding it can be understood that the occurrence of interest is due to encouragement from feelings of pleasure and attention to something. The factors that influence interest are: internal factors are something that makes students interested, which comes from within themselves. These internal factors include: concentration of attention, curiosity, motivation, and needs; External factors are something that makes students interested that come from outside themselves, such as: encouragement from parents, encouragement from teachers, availability of infrastructure and facilities or facilities, and environmental conditions (Syahputra, 2017). In the learning process, interest is an initial mobilization for students in learning that can be used to achieve the desired goals. This illustrates that someone who has an interest in learning within himself then he will achieve his desires or goals, but if a student does not have an interest in learning then the student will not be able to achieve his desires or goals. Student interest in learning is needed in learning, so that students have an interest in the material being taught. In addition to interest, students also need encouragement or movement to achieve their goals or ideals.

Many factors can affect the learning process or the desire to learn in individuals. These factors can come from within the individual or outside the individual. Interest in learning and auditory learning style factors come from within the individual, namely those that are innate and

International Journal of Social Science, Educational, Economics, Agriculture Research, and Technology (IJSET)
E-ISSN: 2827-766X | WWW.IJSET.ORG

706

THE RELATIONSHIP BETWEEN AUDITORY LEARNING STYLES AND PEER INTERACTIONS WITH MATHEMATICS LEARNING INTEREST SMAS STUDENTS HOPE STEM ATTACKS

Eka Puji Safitri, Hasanuddin, Suaidah Lubis

those that come from outside the individual, namely the social environment such as peer interaction. These factors greatly affect one's interest in learning because the more factors supporting learning activities, the greater the interest in learning. And vice versa, the more inhibiting factors in learning activities, the smaller the interest in learning, so that changes in behavior that occur are very small. To improve student learning achievement, solutions are needed that can increase enthusiasm and foster student interest in learning while in class to participate in teaching and learning activities and can influence students in obtaining satisfactory results. One solution that can be done to overcome the problems that have been identified is to use external factors, namely peer interaction and internal factors which include factors that exist in students, namely students' auditory learning styles. Based on this, the purpose of this study was to determine the relationship between auditory learning style, peer interaction with interest in learning mathematics for SMAS Harapan Batang Serangan students.

2. RESEARCH METHODS

This type of research uses a survey approach, the identification of research variables consists of The dependent variable is Interest in Learning Mathematics (Y) while the independent variables are Auditory Learning Style (X1) and Peer Interaction (X2). Operational definitions of research variables, research subjects, data collection methods, validity and reliability of measuring instruments, and data analysis methods. The population is the total number consisting of objects or subjects that have certain characteristics and qualities determined by the researcher to study and then draw conclusions (Sugiyono, 2017). In this study, a sample of 183 students was taken based on a random sampling technique from a total population of 243 students. The data collection method is obtained through a scale instrument. According to Azwar (2015) a psychological scale is a measurement tool that measures aspects or attributes of psychological samples through behavioral indicators translated into question items or statements. The data needed in this study were obtained through three kinds of scale instruments, namely Interest in Learning Mathematics, Auditory Learning Styles and Peer Interaction.

3. RESULTS AND DISCUSSION

The data in this study are auditory learning style scale data (X1), peer interaction scale data (X2) and learning interest scale data (Y). With a predetermined sample size of 183 students. Furthermore, the data obtained were analyzed using the help of the SPSS program to answer the research formulations and hypotheses previously proposed.

a. Research Data Trend Level

The trend level of research data is grouped into five categories, namely: Very High (ST), High (TG), Moderate (SD), Low (RH), and Very Low (SR). The trend level of research data for each research variable is determined based on the highest ideal score and the lowest score on each research scale used. The class interval or range of scores for each category is calculated using the range of scores as follows:

$$\text{Interval Kelas} = \frac{\text{Skor Ideal Tertinggi} - \text{Skor Ideal Terendah}}{\text{Jumlah Kategori}}$$

b. Level of Tendency Auditory Learning Style Data

The number of items on the auditory learning style scale is 11 items which are valid and reliable with four answer choices, so that the ideal highest score is 11 x 4 = 44 and the ideal lowest score is 11 x 1 = 11. The class interval or range of scores for each category on the scale auditory learning styles as follows:

707

International Journal of Social Science, Educational, Economics, Agriculture Research, and Technology (IJSET)
E-ISSN: 2827-766X | WWW.IJSET.ORG

Interval Kelas $= \dfrac{44-11}{5} = 6{,}6$ is fulfilled to be 7

Based on these results, the criteria for the level of tendency of the auditory learning style scale are determined as follows:
- Score 43 – 50 : Very High (ST)
- Score 35 – 42 : Height (TG)
- Score 27 – 34 : Moderate (SD)
- Score 19 – 26 : Low (RH)
- Score 11 – 18 : VeryLow (SR)

Furthermore, based on the results of data analysis on the auditory learning style scale of the 183 students who became the research sample, the criteria for the level of tendency of the student auditory learning style scale are briefly summarized in table 1

Table 1. Distribution of the Trend Level of Auditory Learning Style Data

No.	Score interval	Amount	Percentage	Category
1	43 – 50	177	96.0%	Very High (ST)
2	35 – 42	6	4.0%	Height (TG)
Total		183	100%	

Based on the data in table 1 above, it can be explained that of the 183 students who were used as the research sample, 177 students (96%) had a very high auditory learning style and as many as 6 students (4%) had a high auditory learning style. Thus, based on the research data, it shows that the majority of students who are the research sample have a very high level of auditory learning style tendency.

a. Level of Tendency Peer Interaction Data

The number of items on the peer interaction scale used as a data collection tool is 21 valid and reliable items with four possible answers, so that the ideal highest score for the peer interaction scale is 21 x 4 = 84 and the ideal lowest score is 21 x 1 = 21. The class interval or range of scores for each category on the peer interaction scale is as follows:

Interval Kelas $= \dfrac{84-21}{5} = 12.6$ is completed to 13

Based on these results, the criteria for the level of tendency of the peer interaction scale are determined as follows:
- Score 77 – 90 : Very High (ST)
- Score 63 – 76 : Height (TG)
- Score 49 – 62 : Moderate (SD)
- Score 35 – 48 : Low (RH)
- Score 21 – 34 : Very Low (SR)

Furthermore, based on the results of data analysis of the peer interaction scale of the 183 students who became the research sample, the criteria for the level of tendency of the student peer interaction scale are briefly summarized in table 2

Table 2 Distribution of Tendency Level Peer Interaction Data

No.	Score interval	Amount	Percentage	Category
1	77–90	51	27.0%	Very High (ST)
2	63–76	92	50.0%	Height (TG)
3	49–62	40	23.0%	Moderate (SD)
Total		183	100%	

International Journal of Social Science, Educational, Economics, Agriculture Research, and Technology (IJSET)
E-ISSN: 2827-766X | WWW.IJSET.ORG

708

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Eka Puji Safitri, Hasanuddin, Suaidah Lubis

Based on table 2 above, it can be explained that of the 183 students who were used as the research sample, 51 students (27%) had very high peer interaction, 92 students (50%) had high peer interaction and 40 students (23 %) whose peer interaction is moderate. Thus, based on research data, it shows that the level of peer interaction tends to be in the high category.

c. Level of Tendency Data Interest in Learning

The number of items on the learning interest scale used as a data collection tool is 21 valid and reliable items with four possible answers, so the ideal highest score for the learning interest scale is 21 x 4 = 84 and the ideal lowest score is 21 x 1 = 21. Class interval or the range of scores for each category on the learning interest scale as follows:

$$\text{Interval Kelas} \quad = \frac{84-21}{5} = 12.6 \text{ is completed to } 13$$

Based on these results, the criteria for the level of interest in learning interest scale are determined as follows:

-Score 77 – 90   : Very High (ST)
-Score 63 – 76   : Height (TG)
-Score 49 – 62   : Moderate (SD)
-Score 35 – 48   :Low (RH)
-Score 21 – 34   : Very Low (SR)

Furthermore, based on the results of data analysis on the learning interest scale of the 183 students who became the research sample, the criteria for the level of tendency of the student learning interest scale are briefly summarized in table 3

Table 3. Distribution of Learning Interest Data Tendency Levels

No.	Score interval	Amount	Percentage	Category
1	77–90	73	39.0%	Very High (ST)
2	63–76	85	46.0%	Height (TG)
3	49–62	25	15.0%	Moderate (SD)
Total		183	100%	

Based on table 3 above, it can be explained that of the 183 students who were used as the research sample, 73 students (39%) had a very high interest in learning, 85 students (46%) had a high interest in learning and 25 students (15%) whose interest in learning is moderate. Thus, based on the research data, it shows that the level of interest in learning tends to be in the high category.

Based on the test results, the following results were obtained:

Table 1. Calculation of the Determination Coefficient Test (R2)

Summary models

Model	R	R Square	Adjusted R Square	std. Error of the Estimate
1	.242a	059	045	10.87471

a. Predictors: (Constant), Auditory Learning Style, Peers

709

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E-ISSN: 2827-766X | WWW.IJSET.ORG

Table 2. Calculation of the F-Test

ANOVAa

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1029042	2	514,521	4,351	.015b
	residual	16556.315	140	118,259		
	Total	17585.357	142			

a. Dependent Variable: Learning Interest

b. Predictors: (Constant), Auditory Learning Style, Peers

Table 3. Calculation of the t-test

Coefficients

Model	Unstandardized Coefficients B	std. Error	Standardized Coefficients Betas	Q	Sig.
1 (Constant)	42,581	7,291		5,840	.000
Friends of the same age	.176	094	.154	1870	.064
Auditory Learning Style	.314	.145	.179	2.175	.031

a. Dependent Variable: Learning Interest

From the results of calculating the regression statistics, it is known that the regression line equation is:

$$Y = 42.581 + 0.176 X1 + 0.314 X2$$

1. Effect of Auditory Learning Style (X1) on Learning Interest (Y)

   In this study, data on students' interest in learning were collected using a scale of interest in learning in the form of a Likert scale of 21 statement items that were declared valid (decent) and reliable (reliable). The results of data collection on the scale of interest in learning can be explained that of the 183 students who were used as the research sample, there were 73 students (39%) whose interest in learning was in a very high category, as many as 85 students (46%) whose interest in learning was classified as high and 25 students (15%) who interest in learning is moderate.

   Peer interaction data was collected using a peer interaction scale in the form of a Likert scale with 21 statement items that have been declared valid (proper) and reliable (reliable). The results of data collection on the scale of peer interaction can be explained that of the 183 students who were used as the research sample, 51 students (27%) had very high peer interaction, 92 students (50%) had high peer interaction and 40 students (23 %) whose peer interaction is moderate.

   Furthermore, based on the results of the hypothesis from the results of statistical analysis it was found that there was no significant effect of peer interaction on learning interest. This is shown by the t coefficient of 1,870 with $p > 0.05$, namely $0.06 > 0.05$, thus

International Journal of Social Science, Educational, Economics, Agriculture Research, and Technology (IJSET)
E-ISSN: 2827-766X | WWW.IJSET.ORG

710

THE RELATIONSHIP BETWEEN AUDITORY LEARNING STYLES AND PEER INTERACTIONS WITH MATHEMATICS LEARNING INTEREST SMAS STUDENTS HOPE STEM ATTACKS

Eka Puji Safitri, Hasanuddin, Suaidah Lubis

it can be concluded that students' interest in learning is not influenced by their interactions with peers.

According to Bobbi Deporter & Mike Hernacki a person's learning style is a combination of how he absorbs and then organizes and manages information. Auditory learning style is a learning style that relies on hearing to be able to understand and remember. The characteristics of the auditory learning style really place hearing as the main tool for absorbing information and knowledge.

2. The Effect of Peer Interaction (X2) on Learning Interest (Y)

From the results of statistical analysis it was found that there was no significant effect of peer interaction on learning interest. This is shown by the t coefficient of 1,870 with $p > 0.05$, namely $0.06 > 0.05$, thus it can be concluded that students' interest in learning is not influenced by their interactions with peers.

Peer interaction will greatly affect student learning interest. Through peers usually children can exchange information about subject matter. In fact, children will be more comfortable when discussing with their peers rather than asking the teacher, due to the same age factor and interacting more frequently in daily life within the school environment and outside the school environment. So that it will make it easier for students to capture and understand the material being studied, in the end it will foster student learning interest and will have an impact on student learning achievement which will be good.

In fact, the results of research in the field of Harapan Batang Serangan Private High School students did not show a significant relationship between peers and learning interest. Researchers observed the reason for the absence of a significant relationship between peer interaction and interest in learning because students played more with their peers than paying attention to the teacher explaining learning material so that students' interest in learning became low.

3. Relationship Between Auditory Learning Style (X1) and Peer Interaction (X2) with Learning Interest (Y)

From the results of statistical analysis it was found that there was a significant relationship between auditory and peer learning styles and learning interest. This is indicated by the coefficient F reg = 4.351 with $p < 0.05$, namely $0.01 < 0.05$, and the correlation coefficient R = 0.242 with $p < 0.05$, namely $0.04 < 0.05$ and $R^2 = 0.059$; thus it can be concluded that the auditory learning style and peer interaction simultaneously influence student learning interest, the contribution of both in generating interest in learning is 5.9%.

Peer interaction is a group of children with more or less the same age level and has an influence on child development and is able to provide information about the world outside the family. One of the most important functions of peer interaction is to provide a source of information and comparison about the world outside the family.

From the observations of the researchers, the peer interaction in the Harapan Batang Serangan Private High School environment was classified as very good, this was evidenced by the frequent interaction of students with other students, both on the topic of talking about learning and in playing. In the process of learning mathematics teachers often form small groups to discuss and answer questions given by the teacher, this makes students really listen to the teacher's explanation so that students' auditory learning styles will play a very important role during learning which in conclusion will generate interest in learning those students.

Students' interest in learning will grow because of influences from outside the individual student's self, one of which is from peers. Peer interaction is very necessary in fostering student interest in learning, usually children will be more comfortable discussing with their peers than with the teacher. In the learning process students usually often feel bored and bored, this impact will result in non-optimal learning interest. One solution

711

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students must have a learning style. Learning styles and peer interaction are needed in the learning process to arouse student learning interest. If students have a good interest in learning, it will have an impact on their learning achievement, which will also be good.

4. CONCLUSION

Based on the research findings, analysis and hypothesis testing, several conclusions can be drawn as follows:

1. Auditory learning style is related to the learning interest of Harapan Batang Serangan Private High School students, while peer interaction is not related to the learning interest of Harapan Batang Serangan Private High School students.

2. There is a significant relationship between auditory learning styles and peer interaction with the learning interests of Harapan Batang Serangan Private High School students.

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712