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Investigation in Vocation High School for Attitude and Motivation Students in Learning Physics Subject

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ABSTRACT

Purpose of the study: This study investigates the relationship between students' attitudes and their motivation to study physics in vocational high schools. Recognizing that physics is often perceived as a difficult subject, this research seeks to understand how affective factors influence student engagement and achievement, particularly in vocational education settings where applied sciences are critical.

Methodology: The study employs a quantitative descriptive design with a correlational approach, using validated questionnaires distributed to vocational students. To enrich the quantitative findings, semi-structured interviews were conducted to explore students' perceptions more deeply based on specific indicators of attitude and motivation. Data were analyzed using both descriptive and inferential statistics, particularly Pearson correlation analysis.

Main Findings: The results revealed that both students' attitudes towards physics and their motivation to learn were generally in the "fairly good" category. A positive and significant correlation between the two variables was found, with a moderate Pearson correlation coefficient of 0.622, indicating that students with a more positive attitude tend to have higher motivation levels. This emphasizes the vital role of affective domains in supporting physics learning outcomes.

Novelty/Originality of this study: This study introduces a novel integrated analytical framework that merges quantitative correlation data with qualitative insights, providing a deeper understanding of the synergy between attitudes and motivation. Unlike previous research that often examined these factors independently, this study emphasizes their interrelated impact on vocational physics education, offering new directions for designing affective-based learning interventions aimed at improving student cognitive, affective, and psychomotor performance in technical fields.

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1. INTRODUCTION

Education is an activity that has the purpose of preparing students to be people who have a positive contribution to society [1]-[3]. Education is a conscious and planned effort to create an atmosphere of learning and learning process so that students actively develop their potential to have spiritual strength, self-control, personality, intelligence, noble character and the skills needed by themselves and the community [4]-[7]. In Indonesia, vocational education is represented in the Vocational High School (SMK) which is a work-oriented

school and one of the objectives is to provide students with ready-to-work provision as a skilled mid-level workforce in accordance with the requirements demanded by the world of work. According to Sethakul (2019), vocational education is part of the education system that prepares a person to be better able to work in one occupational group or one occupation, especially in the field of electricity more specifically in physics subjects. Therefore, good attitudes and perceptions of students are needed in physics [8].

Today's era, one most important subject that takes effect on human life and technology is physics. Physics have an important role to explain the phenomena in this life [9], [10]. Physics is also the basis of science that requires special attention because increasing information and communication, health, environment, coordination, and security is increasingly developing with the support of physical knowledge and concepts [11], [12]. In Indonesia, students start learning physics as a general subject from elementary school level. In Vocation High school level, discussion of physics material more deeply and specifically. Especially for students who are deep in science or in a science major, physics is one of the subjects that must be studied.

Generally, students embrace physics as a scary subject. According to Guido (2013), Physics is considered as the most problematic area within the realm of science, and it traditionally attracts fewer students than other sciences like chemistry and biology [13]. Physics is Hardest to understand for high school students and students. Difficulties in understanding physics are viewed in terms of complex material and use many formulas. So, in learning physics requires a mature and continuous concept [14]-[16]. Besides that, studying physics is not only about mastering facts and concepts, but also studying physical events that include processes, products and explaining how natural phenomena/phenomena are measured in observation and research. Difficulties in understanding physics make students' interest in physics less. Lack of interest in learning physics will affect student attitudes in learning.

Attitude is the part of an individual itself that influenced the skill in any performance and as a learning outcome maintaining internal stability that can influence selection in one's actions [17]-[19]. Attitude is influenced by personal opinions and is formed from experience and education. Mbajiorgu and Reid (2006) state that attitudes tend to be stable over time after they are formed and can influence or be influenced by achievement and cognition [20]. The attitude is related to the handling and management of emotions that occur during the learning process and plays an important role in directing human behavior. Attitude aspects include feelings of interest, appreciation, obedience to moral values, and emotions. In the learning process, that attitude serves as a force that will move people to learn. Therefore, attitude is an aspect of learning that must be assessed.

Attitude toward the physics subject is most likely a student's favored towards the physics subject. Alimen (2009) says that A person's favorable outlook or attitude about a particular object or situation can have an impact on his liking or disliking it [21]. Attitudes towards physics not just merely about student's personal interest in physics, but also another aspects such as their view of the coherence of physics knowledge, the relevance of the physics they learn in class to the real world, and the connection between mathematical equations and physics concepts [22]. Students' attitudes toward physics are feelings towards physics, willingness to learn, and awareness of the benefits of physics. This attitude really determines interest and interest in physics subjects. The greater his interest in physics, the easier it will be in studying physics.

Many factors could contribute to student's attitude towards studying physics [23]-[26]. Attitude is also an abstract thing because it deals with emotions and the scope is also very broad. Therefore, measuring attitudes towards physics subjects cannot be done accurately. By determining indicators related to attitudes, measurements can be made more specifically and easily. In the previous study, Darmawangsa (2018) made an attitude instrument towards physics subjects based on 7 indicators. The indicators are the development of the TOSRA test instrument. The indicators of attitude toward physics are the social implication of physics, the normality of science, attitudes toward physics investigation, scientific attitude's adoption, the enjoyment in studying physics, interest increasing learning time to studying physics, and career interest in physics.

There are four of the seven indicators of attitude toward physics subjects that were of concern in this study. These indicators are attitudes towards investigation in physics, adoption of scientific attitudes, interest in increasing the time to study physics, and interest in a career in physics. Attitude toward physics investigation is needed when students have to solve the problem and searching for the truth of something in a scientific way, using methods step by step in every process. The investigation also refers to the incorporation of those processes with knowledge and scientific reasoning and critical thinking [27]-[29]. Scientific attitude is one of the important aspects of science [30], [31]. Scientific attitude's adoption is more like how the way students thinking. The scientific attitude of mind is an interest in such a question [32]. Science world is full of discovering how things work as a casual system. So, scientific attitude will contribute to make the task more creative and hook the curiosity. In studying physics, interest in increasing learning time to study showed how student enjoyment and interest in deep learning of physics. Student's interest in physic will affect their career choice in the future. These indicators likely affected in the large area of the physics learning process.

In physics learning, another factor that can affect the student's achievement is motivation. Motivation could be that it is an internal state that arouses, directs and sustains students' behavior [33], [34]. Motivation is defined as the level of effort and intensity directed at goals related to learning or performance. Motivation is like

a machine that moves students and determines the fast or slow learning of students. Students who naturally motivated to learn, they are the ones who succeed [35]. Motivation is the key ingredient not only in outstanding achievement but also in extraordinary achievement [36], [37].

There are many indicators to measure motivation, such as interest to participating in physics to studying physics, has a tendency to make an effort to Succeed, not easily hopeless in learning physics when facing an obstacle (problem), not feeling worried to face future physics tests. Students interest to participating in the learning process showed their will to understand what they learn. The goal achievement theory means motivation refers to qualitative goals or goal orientations that involve students in learning activities [38]. The tendency to make an effort to succeed showed about student's action and their seriousness in studying. Students' tendency to never give up when facing an obstacle, searching another way to understand in learning, and their confidence that they have abilities also part of the motivation effect. The sources of motivation can be both generated from the past events or antecedent conditions and the future goals of each individual, considered to be an important factor in determining students' academic success [39]

Attitude and motivation here showed there is a relation in student's success in their academic. Both have an effect on the learning process. But what is the relationship between the two, namely between this attitude and motivation is still unclear. So, the aims in this study were to determine the correlation between motivation and attitudes of students towards physics learning in vocation high school. with the following research questions

1. How to describe the attitude towards physics investigation?
2. How to describe students Scientific attitude's adoption
3. How to describe student's interest in increasing learning time to studying physics?
4. How to describe their students career interest in physics?
5. How to describe students' motivation to be interested in participating in physics learning?
6. How to describe the motivation of students who have a tendency to make an effort to Succeed?
7. How to describe the motivation of students who not easily hopeless in learning physics when facing an obstacle (problem)?
8. How to describe the motivation of students who won't feel worried to face future physics tests?

What is the relationship between students' motivation and attitudes towards physics subjects?

2. RESEARCH METHOD

This study uses a mixed methods approach. Martens (2010) "Mixed methods can refer to the use of quantitative and qualitative data in answering research questions as well as being part of a larger research program designed as a complement to provide information related to different methodological approaches [40]. The type used is sequencial explanatory. Explanatory is a research where initial data collection is quantitative, and then qualitative data are followed, which means that quantitative data is strengthened by the qualitative data that will be obtained [41]. In this study, the researcher used cluster sampling technique. Cluster sampling is a form of sampling in which clusters rather than single-unit elements are randomly selected [42]. The sample in this research were vocation high school students 3, vocation high school IX Lurah, Taruna vocation high school in Kota Jambi which numbered 782 students, consist of male students and female students in the different class from the grade 10, grade 11 and grade 12.

The instruments used in this study were questionnaires and interviews which were intended to reinforce the results of quantitative data. The questionnaire is a list of questions given to other people who are willing to become respondents [43]. While interviewing is a technique of collecting data directly from the resource person by asking questions related to the research [44]. The study used two questionnaire instruments which are the attitude questionnaire adopted from the Darmawangsa (2018) [45] and motivational questionnaire adopted from Sudibyo (2015) [46]. In this study, we did not test the validity and reliability of the instruments used, but adopted them, Attitude questionnaire has 34 valid statements and Cronbach alpha reliability value is 0.9. Motivation questionnaire has 11 valid statements and Cronbach alpha reliability value is 0.86. Attitude and motivation using Likert scale 5 (five), for positive statements; 1 (very not goof), 2 (not good), 3 (enough), 4 (good), 5 (very good) and the reverse for negative statements. In this study, researcher searching the instrument that fits to measure the variables. After getting a valid instrument, the researcher determines the sample using cluster sampling. Then, two questionnaires were distributed to schools that had been sampled. After distributing the questionnaire, researchers also conducted interviews with 30 students randomly and analyzed interviews using miles & huberman, namely the reduction of data, display data, and conclusions [47]. Questions in interviews are made based on indicators of the attitude and motivation variables.

Below is a category of the character of caring for the attitude towards physics in table 1 and motivation in physics learning in table 2.

Table 1. Category for Students Attitude

Category	Interval			
	Attitude toward Physics Investigation	Scientific attitude's adoption	Interest increasing learning time to studying physics	Career Interest in Physics.
Very Not Good	9.0 – 16.2	7.0 – 12.6	8.0 – 14.4	10.0 – 18.0
Not Good	16.3 – 23.4	12.7 – 18.2	14.5 – 20.8	18.1 – 26.0
Enough	23.5 – 30.6	18.3 – 23.8	20.9 – 27.2	26.1 – 34.0
Good	30.7 – 37.8	23.9 – 29.4	27.3 – 33.6	34.1 – 42.0
Very Good	37.9 – 45.0	29.5 – 35.0	33.7 – 40.0	42.1 – 50.0

Table 2. Category for motivation physics learning

Category	Interval			
	The Tendency to Make an Effort to Succeed.	Tendency to Easily Hopeless in Learning Physics When Facing an Obstacle.	The Concern to Face the Future Physics Tests.	Interest to participating in Learning Physics.
Very Not Good	2.0 – 3.6	1.0 – 1.8	2.0 – 3.6	6.0 – 10.8
Not Good	3.7 – 5.2	1.9 – 2.6	3.7 – 5.2	10.9 – 15.6
Enough	5.3 – 6.8	2.7 – 3.4	5.3 – 6.8	15.7 – 20.4
Good	6.9 – 8.4	3.5 – 4.2	6.9 – 8.4	20.5 – 25.2
Very Good	8.5 – 10.0	4.3 – 5.0	8.5 – 10.0	25.3 – 30.0

To analysis descriptive and inferential statistics data, the researcher using the SPSS 23 program to process. Descriptive is the kind of statistic to a presentation of large amounts of data, in this case in the form of summary frequencies, for example, mode, mean, median, minimum, maximum and standard deviation [44]. Inferential Statistical using probabilities and information about samples to draw a conclusion about the population which the sample is presumably was drawn [48]. For interviews analyzed using miles & huberman, namely the reduction of data, display data, and conclusions [47].

3. RESULTS AND DICUSSION

The Indicator of Attitude toward Physics Investigation

The result of the analysis descriptive about the attitude of students in vocation high school toward physics based on the indicator of "attitude toward physics investigation" can be seen on the table 3.

Table 3. The results of attitude questionnaire indicator attitude toward physics investigation

Category			Mean	Min	Max	%
Range	Attitude	Total				
9.0 – 16.2	Not very good	2				0.3
16.3 – 2..4	Not good	29				3.7
23.5 – 30.6	Enough	346	34.0	10	43	44.2
30.7 – 37.8	Good	362				46.3
37.9 – 45.0	Very good	43				5.5
TOTAL		782				100

Based on the table, students in vocation high school with a good attitude in this indicator are relatively high at 46.3%. In the second place, students have enough good attitude with a presentation about 44.2%. However, there are still some students have a bad attitude with percent total about 4%. This result shows that the average of student attitude in the indicator of attitude toward physics investigation has dominant in the good category.

Based on the description's result in the indicator of attitude toward physics investigation, researchers found that students attitude toward physics subject in vocation high school are relatively good. This is mean that average students have good attitude related to physics investigation. For example, experiment, searching the truth of the theory or problem resolving by scientific methods. When the researchers ask the student about their

opinion toward the experiment and their reason, almost student said they love it because it's interesting and not boring. Here is one of the resulting interview with the student.

"How do you feel when you experiment? Why?"

"I like it. It's not boring as learning about theory. By doing experiments, I also know the application of the laws of physics. And, I feel like… I understand better with experiment".

"If you are having trouble finding answers or certain things during your experiment, would you rather find your own answers or ask a friend?"

"I would rather find out for myself by reading the books or internet source. But of course, sometimes when we found out the answer in the book maybe and still hard to understand, I will just ask the teacher or friend to know better".

The interview result showed that investigation in physics make students confident with their ability and more understand better than just learning theory. Students' self-confidence in their ability to study the natural and mathematical sciences strongly determines their involvement in investigative activities [52]. The experiment makes students more active in learning so that they will not boring and rather feel enjoy in learning. It will change their behavior in their knowledge and creativity [53]. When students find the problem in the way, they try to find out the answer by them self and ask the other to understand more.

Scientific Attitude's Adoption

The result of the analysis descriptive about the attitude of students in senior high school toward physics based on the indicator of scientific attitude's adoption can be seen in the table 4.

Table 4. The results of attitude questionnaire indicator scientific attitude's adoption.

Category			Mean	Min	Max	%
Range	Attitude	Total				
7.0 – 12.6	Not very good	0				0
12.7 – 18.2	Not good	11				1.4
18.3 – 23.8	Enough	192	26.0	14	32	24.6
23.9 – 29.4	Good	474				60.6
29.5 – 35.0	Very good	105				13.4
TOTAL		782				100

The table shows that students attitude toward physics about the indicator of scientific attitude adoptions with the good category are very high at 60.6%. And for students attitude with the bad category in the low presentation about 1.4%. This result shows that the average of students in vocation high school has a good attitude toward physics based on scientific attitude's adoption.

On the indicator of scientific attitudes' adoption showed, vocation high school students attitude are good on average. It means, students already know and behave like a scientist. The way students thinking were more scientific. In the interview session, researchers ask they manage about others opinion and about new things. Average students answer that they don't mind with a different opinion. They accepted the different thingy to know the best answer. They also like to learn new thing and welcome new information. Here is one of the resulting interview with a student.

"Do you like hearing different opinions from you? Why?"

"I like to hear it. So, I can see the difference between thinking of mine and others. And if mine is wrong, I will know my mistake. Also, even I don't agree with another opinion, it is not too bad to be my reference".

"do you like to find out something new and what is the reason?"

"yes I do. Find something new will be more interesting, right? It is fun and makes my curiosity increased. I get new information and learn a new thing".

The interview above showed that students in high school more open-minded. Students hear another opinion as their reference to re-think. The student also looks at 'what's new' as an interesting thing. They enjoy their curiosity and the journey to learn/to get new information. 3 main components of scientific attitudes are beliefs, feelings, and actions [54]. From students' answers, the adoption of scientific attitudes is evident from the belief in their opinions, having positive feelings for new things, and enjoying their actions to satisfy curiosity.

Interest increasing learning time to studying physics

The result of the analysis descriptive about the attitude of students in vocation high school toward physics based on the indicator of "interest increasing learning time to studying physics" can be seen in the table 5.

Table 5. The results of attitude questionnaire indicator Interest increasing learning time to studying physics.

Category			Mean	Min	Max	%
Range	Attitude	Total				
8.0 – 14.4	Not very good	16				2.0
14.5 – 20.8	Not good	80				10.2
20.9 – 27.2	Enough	481	24.0	12	38	61.5
27.3 – 33.6	Good	179				22.9
33.7 – 40.0	Very good	26				3.3
TOTAL		782				100

The data shows that student's attitude toward physics has good enough with the percent about 61.5%. And, some students still have a bad attitude with a total percent of 12.2%. This result shows that dominant attitude toward physics in indicator of interest increasing learning time to studying physics.

Students attitude based on the indicator of Interest increasing learning time to studying physics, the result showed that students attitude are good enough. Most of the students are not too interested in adding hours to studying physics. Students prefer to learn when they need it. Here is one of the resulting interview with a student.

"When you come home from school, do you like to review the physics material at home?"
"Just occasionally. I don't really like physics. It is a difficult subject. I will get bored if I learning it every day. So, when I feel the material needs to be a review, then I do".
"Is there any material that you do not understand in school? How you manage it?"
"yes there is, if I do not understand the material in school then I will go to the library and ask the teacher or friends during break time or when there is an empty hour".

Based on the interview, the student will be studying hard when they have something to achieve. Students who consider physics difficult because he is not interested in adding time to study physics [10]. If they do not have a purpose to study, they will be in bored. Interest in spending time in physics is a form of their seriousness to study physics. To be serious in learning physics need a motive or purpose from a student's internal. Students with the purpose of personal mastery want to improve their competencies and care about mastering the material [35].

Career interest in physics

The result of the analysis descriptive about the attitude of students in vocation high school toward physics based on the indicator of "career interest in physics" to studying physics can be seen in the table 6.

Table 6. The results of attitude questionnaire indicator Career Interest in Physics

Category			Mean	Min	Max	%
Range	Attitude	Total				
10.0 – 18.0	Not very good	6				0.8
18.1 – 26.0	Not good	89				11.4
26.1 – 34.0	Enough	467	31.0	14	48	59.7
34.1 – 42.0	Good	193				24.7
42.1 – 50.0	Very good	27				3.5
TOTAL		782				100

This result shows that students attitude toward physics is not that bad. Even though dominant students attitude in good enough category with the percent about 59.7%, Students attitude with good category also in the second place about 24.7%. However, Students attitude in bad category still high with percentage total 12.2%.

The result in the description of career interest in physics, vocation high school students showed good enough attitude. They like to have a career in physics in the future. Not really into physics, but more in its application and the advance. They like it because it is challenging and sounds fun. Here is one of the resulting interview with a student.

"Are you interested in a career in physics?"
"yes. I'd like to have a career in physics. But it's not to be like a teacher or pure a physics scientist. I like to be an engineer. The basic is physics thou".

By the answer, it showed that student not really interest in deep physics. But they like to have a career basically the advance of physical science. This result affected by their interest in physics. Welch (2010) says, Having a positive attitude and interest in physics can create an interest in the future career in the field of physics will increase [55].

Interest to Participating in Learning Physics

The result of the analysis descriptive about student's motivation to learning physics in vocation high school based on the indicator of interest to participating in physics to studying physics can be seen in the table 7.

Table 7. The results of motivation questionnaire indicator Interest to participating in Learning Physics.

Category			Mean	Min	Max	%
Range	Attitude	Total				
6.0 – 10.8	Not very good	0				0
10.9 – 15.6	Not good	201				1.4
15.7 – 20.4	Enough	527	17.0	12	23	24.6
20.5 – 25.2	Good	54				60.6
25.3 – 30.0	Very good	0				13.4
TOTAL		782				100

Based on the table, Students have good motivation with number presentation 44.5%. It means that students have a tendency to make an effort to succeed. But, some students have lack motivation also high enough about 21.7%. But for commonly, students' motivation to learning physics are relatively good.

The result on the indicator of interest in participating in physics to studying physics, it showed students' motivation is good enough. This mean, their motivation is not bad, but still, lack. They not really into physics, but they do what the teacher said. Here is one of the resulting interview with a student.

"Are you passionate and active in taking physics lessons in class?"

"Not Really. I attended the lesson well. If I really understand, I will be more active. If I don't know something, I will ask. Depend on the situation".

"Do you hasten the task of physics more than any other task?"

"No I don't. I did a physics task when the teacher would ask for it. But if the task is urgent, I will do it first. Sometimes if I really understand the material, I will immediately do it".

The interview says that student's passionate still lacking. Their interest depends on their understanding toward material of physics they learn. They studying properly, but not really interest in the learning process. The difficulty of learning physics is mostly felt by high school students [57]. Learning can improve when students become more aware of what they learn about. When they understand more about it, the student can use the insight gained to help them learn more effectively in the future [58, 59].

Tendency to Not Easily Hopeless in Learning Physics When Facing an Obstacle (Problem)

The result of the analysis descriptive about student's motivation to learning physics in vocation high school based on the indicator of Tendency to Not Easily Hopeless in Learning Physics When Facing an Obstacle (Problem) can be seen in the table 8.

Table 8. The results of motivation questionnaire indicator Tendency to Easily Hopeless in Learning Physics When Facing an Obstacle.

Category			Mean	Min	Max	%
Range	Attitude	Total				
1.0-1.8	Not very good	64				8.2
1.9-2.6	Not good	109				13.9
2.7-3.4	Enough	338	3.1	1.4	4.5	43.2
3.5-4.2	Good	170				21.7
4.3-5.0	Very good	101				12.9
TOTAL		782				100

The data on the table showed that students have good enough in motivation with percent about 43.2%. This result means commonly when students facing an obstacle or problem in learning physics, they will not easily in the hopeless stage. However, some students also have less motivation when they find a problem in learning. That's why some students have lack motivation with total percentage 22.1%.

Based on the indicator based on the difficulty of students to give up studying physics when facing obstacles, the motivation of high school students tends to be good enough. This means that students have enough a 'will to solve' when they faced the obstacle. But it's not strong enough. Here is one of the resulting interview with a student.

"If you find a problem or obstacle in working on the problem, what will you do?"

"I will ask for help from a friend who understands and looks back on whether my method is wrong or not".

The result in the interview says the student has a will to solve the problem. But if they still do not get it, the student will just ask other people who understand and match the way with others do. In fact, by solving problems, a student needs to think and make decisions using appropriate strategies [61]. Average students have a will to solve the problem. But when the obstacle is hard, most of them will end up in asking others to find the way. They did not try their best to find the new methods and their independence is lacking.

The Concern to Face the Future Physics Tests.

The result of the analysis descriptive about student's motivation to learning physics in vocation high school based on the indicator of the concern to face the future physics tests can be seen on the table 9.

Table 9. The results of motivation questionnaire indicator The Concern to Face the Future Physics Tests.

Category			Mean	Min	Max	%
Range	Attitude	Total				
2.0 – 3.6	Not very good	0				0
3.7 – 5.2	Not good	124				15.9
5.3 – 6.8	Enough	279	7.0	2	7	35.7
6.9 – 8.4	Good	346				44.2
8.5 – 10.0	Very good	33				4.2
TOTAL		782				100

The result on the table showed about 44.2% of students have a good motivation in commonly. When they will face the physics test, they won't be worried but ready to pass it. Also, some student has worried about the test with a percentage of about 15.9% in total.

Based on students' concerns in dealing with physics tests, their motivation in learning physics is good. This result means the students do not feel worried about the physics test. Here is one of the resulting interview with a student.

"Are you worried when you face a physics test in the future? Why?"

"I've studied well. So I'm not too worried if it's just a test of the material I've learned. I believe I can answer well if I have learned the material".

The interview above showed students' belief and confidence are good. Students who underestimate their performance can lose motivation study, because of a lack of confidence [62]. Students' belief and confidence come from the students' ability. Students believe in their abilities because they have learned well.

The Tendency to Make an Effort to Succeed

The result of the analysis descriptive about student's motivation to learning physics in vocation high school based on the indicator of the tendency to make an effort to succeed can be seen in the table 10.

Table 10. The results of motivation questionnaire indicator The Tendency to Make an Effort to Succeed.

Category			Mean	Min	Max	%
Range	Attitude	Total				
2.0 – 3.6	Not very good	0				0
3.7 – 5.2	Not good	170				21.7
5.3 – 6.8	Enough	223	7.0	3	9	28.5
6.9 – 8.4	Good	348				44.5
8.5 – 10.0	Very good	41				5.2
TOTAL		782				100

Based on the table, Students have good motivation with number presentation 44.5%. It means that students have a tendency to make an effort to succeed. But, some students have lack motivation also high enough about 21.7%. But for commonly, students' motivation to learning physics are relatively good.

Based on an indicator of the tendency to make an effort to succeed, students' motivation is good. They showed their effort to solving the problem or doing their task in learning. Students trying some methods to make what they want to be success. Here is one of the resulting interview with a student.

"Are you trying to understand physics lessons well? How?"

"Yes I'm. I try to understand better. So, if I don't know how to solve a problem, I will ask a friend to find out the way I can solve it myself".

From the interview, the student has a tendency to make an effort to succeed. Motivation is something that drives a person to complete a tedious task [60]. When students have a tendency to try to succeed, they will think more about ways to strive for higher success rates. That way, student creativity will also be high. Motivation is part of the metacognitive skills that students need to develop in order to learn well [61].

The relationship between attitude and motivation in learning physics

The correlation between attitude and motivation in learning physics subject can be seen on the table 11.

Table 11. Correlation between Attitude and Motivation toward Learning Physics Subject.

		Attitude	Motivation
Attitude	Pearson Correlation	1	0.622**
	Sig. (2-tailed)		0.000
	N	782	782
Motivation	Pearson Correlation	0.622**	1
	Sig. (2-tailed)	0.000	-
	N	782	782

Based on table 11, significant value is 0.00 < 0.05. The value showed that significant data is lower than the alpha value (0.05). It is mean that there is a correlation between attitude toward physics subject with motivation in learning physics subject. The degree of correlation can be seen on the Pearson correlation value. The Pearson correlation value in this research is 0,422. Based on the guidance of correlation degree, this value in the high range (0.62 – 0.8). So, in this research, the degree of correlation is in the middle correlation.

In learning the physics subject, students' attitude and motivation need special attention. Both have an impact on the learning process and affected achievement. Leaving a positive attitude towards physics or more simply, make students liking physics and that is one of the goals or "hidden curriculum" of physics teachers [47]. Motivation is a crucial factor affecting students' learning in school and important for learning because students cannot learn unless they are motivated [21], [26], [34]. Before analysis, the correlation between attitude and motivation of vocation school students in Jambi City, The researcher ensures that the results of students' questionnaire attitudes and motivations are normal and linear data. Data from the questionnaire in this study indicate that normal data is normally distributed. Both questionnaire data are also linear. So that the next correlation test is used Pearson product moment correlation test.

The relationship between attitude and motivation toward physics subject is positive, based on the result. It showed, that students' attitude affected their motivation in learning physics subject in a positive way. When students have a positive attitude toward physics subject, their motivation increase too, in a positive way. Soomro et al, (2011) says, "Both attitudes (positive and negative) affect learning in physics subject, if students attitude negatively towards certain subjects students learning or future career difficult and other side student positive attitudes towards the certain subject that students learning extremely correlate with their achievement" [62].

On the result showed that the correlation Pearson is 0.622. This number is in the high category, which is related to the power of their relationship. High category means that the correlation between attitude and motivation is strong. Both have a relationship and affect each other, but the effect is strong. When a student's attitude toward physics subject is good, so their motivation in learning physics subject is good. In this study, students' attitude towards physics subject is good enough, so their motivation in learning physics is good.

4. CONCLUSION

This study qualitatively concludes that there is a positive correlation between students' attitudes and their learning motivation. Although the strength of this relationship is not particularly high, it still exerts a meaningful influence on students' academic achievement. The research findings, particularly in the context of vocational high schools in Jambi Province, reveal that students generally display a reasonably positive attitude toward learning and possess a good level of motivation. This illustrates that affective factors such as attitudes and motivation are interconnected and play a vital role in supporting students' overall learning experiences and outcomes. Understanding these affective aspects is essential, especially in science learning, where sustained engagement, perseverance, and active participation are required. A positive attitude can nurture greater enthusiasm for scientific inquiry, while strong motivation can drive students to explore, experiment, and overcome challenges encountered during learning processes. Therefore, fostering both attitudes and motivation should become a central strategy in educational improvement efforts.

The implications of these findings for educational practice are significant. Schools should focus on creating learning environments that not only deliver content but also cultivate students' positive emotional engagement. Collaborative learning methods between teachers and students should be prioritized, integrating strategies that actively involve students, recognize their efforts, and build their sense of agency. For instance, adopting project-based learning, problem-solving activities, and inquiry-based science experiments can make learning more relevant, engaging, and motivating. Furthermore, schools should provide structured opportunities for students to experience success, thereby reinforcing positive attitudes and internal motivation. Rewarding both effort and achievement, fostering student autonomy, and promoting peer collaboration can contribute to a more

supportive and empowering learning atmosphere. Teachers play a critical role in this process. By serving as facilitators and motivators, teachers should adopt an empathetic, student-centered approach that acknowledges the emotional and motivational needs of students. Continuous professional development focused on affective teaching strategies can help teachers build classroom cultures that support positive attitudes and intrinsic motivation, particularly in science learning where abstract and complex concepts can otherwise lead to student disengagement. Additionally, schools should integrate regular assessments of students' attitudes and motivation levels into their monitoring systems. This can help identify students who need additional support and inform the development of targeted interventions to enhance affective engagement.

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