



Students' self-confident in STEAM

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ABSTRACT

Purpose of the study: know the teacher's response about student self-confidence in STEAM.

Methodology: This research uses a micro-ethnographic type case study approach. Case study research is intended to study intensively about STEAM-based physics learning and whether it has a relationship with self-confident.

Main Findings: Students will have good self-confidence if a teacher provides good facilities, support, and facilities.

Applications of this study: Very useful for teachers in implementing STEAM-based learning to improve self-confidence.

Novelty/Originality of this study: This study describes the STEM-based physics learning experience by growing self-confidence.

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1. INTRODUCTION

Education is a conscious effort aimed at improving the quality of human resources can be realized one of them through mathematics education that is taught to students in school benches. self-confidence is convincing in the ability and self-assessment in carrying out tasks and choose an effective approach [1]. This includes confidence in one's abilities. To build confidence, there are many ways and processes that must be done. The process must be carried out in daily life and take place regularly. Confidence will bring good in responding to challenges in the 21st century.

Expected 21st Century skills are collaborative, creative, and innovative skills to solve existing problems [2]. Learning with the STEAM approach (Science, Technology, Engineering, Art, and Mathematics) is one of the new methods for preparing 21st-century students. Learning in the 21st Century. The application of the STEAM approach is still not widely applied [3]. The application of the STEAM approach to learning can develop 21st-century skills such as critical thinking and problem-solving, creative and innovative, communication and collaboration, information literacy, media literacy, technology literacy, flexibility and adaptability, self-initiative and direction, social interaction and cross-culture, productivity and accountability, leadership and responsibility [4].

STEAM is an integrated learning approach that encourages students to think more broadly about real-world problems. STEAM also supports meaningful learning experiences and problem-solving and believes that science, technology, engineering, art, and mathematics are interrelated. In STEAM, science and technology can be interpreted through art and engineering, including the mathematical component. Components in STEAM;

1. Problem-solving through innovation and design

2. The link between assessment, learning plans, and learning standards
3. The combination of more than one subject in STEAM and its use in art
4. A collaborative learning environment and process-based learning
5. Focus on things that happen in life

In the STEAM education model, art is not only considered as a separate subject, but as an access point to all other subjects, and also as an innovation. The following are some of the advantages of incorporating art in science and technique as in the STEAM model [5].

1. Helps remove inhibitors of ideas (because there are no wrong words in art)
2. Focus on processes that help lead to innovation
3. Teach the power of observation, people and the environment in learning
4. Helps to hone visual intelligence - spatial and mathematical concepts such as geometry.

The foundation of STEAM actually lies in inquiry learning, critical thinking, and process-based. Process-based here means the process of asking questions, arousing curiosity, and being able to find solutions to a problem. The essence of STEAM learning is to make students more creative in finding solutions to problems [6].

Thus, how STEAM is implemented to improve students' self-confidence. in this study will be explained about the learning of STEAM in the realm of physics.

2. RESEARCH METHOD

This study uses a micro-ethnographic type case study approach [7]. Case study research is intended to study intensively about STEAM-based physics learning and whether it has a relationship with self-confidence. The research subject can be a science teacher who has experience teaching physics based on STEAM, then additional interview data from students [8,9].

The instrument used was an open interview and the research procedure was described in figure 1.

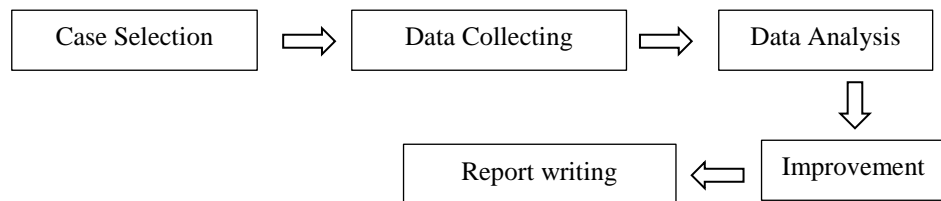


Figure 1. Research Procedure

3. RESULTS AND ANALYSIS

The results and analysis of the researchers' data are explained in five stages. The novelty of this study is an in-depth description based on the experience of professional physics teachers in teaching STEAM.

3.1 Case selection: student confidence

Self-confidence or self-confidence is interpreted as a belief in self that is owned by each individual in his life, and how the individual sees himself as a whole with reference to the concept of self. Self-confidence is an attitude or feeling of confidence in one's own abilities so that the person concerned is not too anxious in his actions, can feel free to do things he likes and is responsible for his actions warm and polite in interacting with others, can accept and respect for others, have the drive to excel and get to know their strengths and weaknesses. Confidence in the ability of the self to unite and move motivation and all the resources needed, and bring it up in actions that are appropriate to what must be completed, or according to the demands of the task.

Belief in this ability will affect the level of achievement or performance. People who do not have full confidence will only achieve less than what they should have been able to accomplish. Thus, even though there are people who have a complete understanding and full ability in what they are doing, if they lack confidence, they will rarely succeed in their duties because of their ability to mobilize motivation and all the resources they have (intelligence, mobilizing colleagues to help) be not optimal [10]. Despite knowing what

to do, this kind of person is usually easy to hesitate or "not dare", or "look around the environment" to be able to fully apply their abilities to a particular situation.

Self-confidence will strengthen the motivation to achieve success, because the higher the confidence in one's own abilities, the stronger the spirit to complete the work. His willingness to achieve what is the target of the task will also be stronger. This means he also has a strong commitment to work well so that the completion of his work goes perfectly. Compared to other people, usually, this kind of person will also finish his work faster and more easily accept different views from his point of view [11]. People who are always suspicious or cannot accept opinions that differ from their opinions are usually worried that their opinions will be worse than those of others. People who have more confidence are more likely to stand out, compared to those who worry too much, who have low self-esteem syndrome. People who have confidence are always sure of themselves because they believe that their abilities will support themselves and their development. So, he believes that what he does will always succeed.

There are two sources of confidence, namely internal and external. Internal sources, meaning that confidence comes from itself. He believes that he has a good understanding base for certain fields for example. This kind of internal source can be greatly influenced by outside encouragement [12]. People who do not have strong self-confidence will be easily influenced by external reactions (coming from outside themselves) to what they are doing [13]. People who lack confidence usually will be sensitive to talk about themselves or their achievements and this kind of thing will certainly affect the implementation of his work. If someone gives a slightly negative reaction to himself, he will be greatly affected [14].

External sources are the environment, for example, other people's attitudes, praise, criticism, and the like. As already stated, people who do not have strong self-confidence will be easily influenced by their environmental reactions to everything they do. Paying too much attention to this kind of reaction will hamper the implementation of the solution of what he is doing. Finally, his energy is not directed at what is being done but instead is divided between completing his task and thinking about what the environment reacts to it. People who are confident will also respect others. Because he believes that other people also have abilities like himself. He also does not easily blame others. Because he believes that everyone has positive values that can be developed, this person is also easy to build relationships and always believes that other people will be invited to develop themselves.

Psychologically, there is always a positive relationship between self-confidence, self-acceptance, self-actualization/self-realization, self-analysis, self-awareness, and self-concept. This means that people who have strong self-confidence, will easily accept themselves as they are (with all the advantages and disadvantages), will easily achieve good achievements (self-actualization/self-realization) [15,16]. He is also easy to do an analysis of himself (because he has accepted himself as is), so he has a strong self-awareness: know exactly the weaknesses that must be reduced and strengths that can be developed. He also is not easily influenced by negative things, because his self-concept is strong. Not angry when criticized (because he knows his weaknesses), and not easily overcome by excessive pride (so that eventually becomes arrogant or arrogant) when praised.

Psychological index, where the physical and emotional status will affect one's ability. High emotions, such as anxiety about mathematics, will change one's confidence in their abilities. Someone in a state of stress, depression, or tension can be an indicator of the likelihood of failure [17,18].

From these influences, confidence plays a role in the level of achievement to be obtained. Self-confidence touches almost all aspects of human life, whether thinking productively, pessimistically or optimistically, how they motivate themselves, vulnerability to stress and depression, and chosen decisions. Thus weighing and remembering self-confidence is very important, the researchers focus their research on the self-confidence of STEAM.

3.2 Data collection: self-confidence in STEAM

This section researchers describe based on interviews conducted by researchers with teachers who are experienced in teaching. From the teacher's statement as follows;

"I am more inclined to use STEAM in teaching because it has complex aspects to develop students' abilities"

The teacher gives a statement that the use of STEAM to develop students' abilities to be more complex. STEAM-based learning not only teaches physics but the linkages of several scientific sciences in

everyday applications [19]. In addition aspects of values and character will be seen in every study. So STEAM is a very good part to develop.

Furthermore, the teacher said, that to increase students' confidence in facing future challenges, it is highly recommended for a STEAM-based approach. This is consistent with the teacher's statement as follows;

"Once I heard a student say" I will do it ". This statement of the students was very enthusiastic about the learning process that took place at the time when discussing irrigation machines "

The sentence above gives an indirect description that students have the confidence to take the role of a volunteer in learning. This ability does not come just like that, it has the process and role of a teacher. In other discussions, there are some things that must be considered for teachers. In STEAM, science and technology can be interpreted through art and engineering, including the mathematical component [20]. That is, the teacher must have good process skills in learning. Teachers need to present learning that can provide meaningful and enjoyable learning experiences for students. The learning process must be student-centered and stimulate students to solve problems. The teacher's role in learning is not only as a learning resource but also as a facilitator.

3.3 Data analysis: why STEAM increases student confidence

STEAM is an abbreviation for Science, Technology, Engineering, Arts and Mathematics, is one of the educational approaches that uses five basic sciences namely knowledge, technology, engineering, arts and mathematics [21,22]. Comprehensively, the end result expected from the application of the STEAM method is students who take serious risks, engage in experiential learning, persist in problem solving, embrace collaboration, and work through the creative process [23].

Based on information from the teacher, STEAM does not increase self-confidence directly, but the learning process using STEAM requires students to be confident. The learning process that requires students to do activities, choose choices, analyze will foster the courage to make decisions. Habits in learning like this will encourage students to be confident.

3.4 Improvements: data supported from student interviews

Students tend to be confident to do activities. This tendency is because students are used to facing situations where students must choose, present, and display learning outcomes in front of the class. This statement is in accordance with student responses;

"I'm confident because I'm ordinary, and things will be easy if I'm confident"

STEAM requires students to analyze a case with the approach of science, technology, generation, art, and math. First, students find it difficult when at the beginning of learning, because they have to deal with problems that exist in life. However, after walking for several months, students feel happy. This is in accordance with the following statement;

"At first I didn't like STEAM, a lot of problems solving, now I will do anything (smile)"

From the above statement, students become more confident by learning STEAM-based physics. This gives a positive influence to be a lesson for other teachers. From some of the students' statements, the researcher draws the main points to make the essence. Students who have confidence in learning STEAM-based physics are as follows;

1. Always be calm in doing everything.
Have confidence in his abilities so that he is optimistic in seeing and doing things.
2. Has sufficient potential and ability.
Namely to have encouragement and try to want to achieve something while still having wise considerations according to common sense.
3. Able to neutralize tensions that arise in various situations.
A confident child sees a problem or something according to the truth that it should, not according to personal truth or according to himself.
4. Able to improve themselves and communicate in various situations

5. That is a condition that can stand alone and does not depend on others in carrying out their duties or other things.
6. Have a mental and physical condition that is good enough to support his appearance.
Confidence in the ability of self that is the positive attitude of the child about himself that the child truly understands what he is doing.
7. Have enough intelligence.
Namely the desire to change for the better or in other words towards progress.
8. Having expertise or other skills that support his life.
That is the positive attitude of children who always have a good view of dealing with everything about themselves, their hopes, and their abilities.
9. Having the ability to socialize.
Namely the ability to pour thoughts into others without feeling hampered by place, atmosphere, and age range.

3.5 Report writing: taking the gist of information and finding solutions

In this section, after analyzing the results of in-depth interviews with the teacher and some student statements, researchers know the essence of this study. So researchers provide suggestions for increasing self-confidence, as follows;

1. Understand what needs to be done or get used to complete tasks well. As in STEAM learning, students must solve and view problems from five aspects of science, namely; science, technology, engineering, art, and mathematics.
2. Look for examples from others and observe how they work. As in some learning that has taken place or with existing environmental phenomena, students must be careful of all the existing conditions. This accuracy will educate students to be more confident in doing activities in general.
3. Looking for support or support from others or the environment. In this section, the role of a teacher is very important in increasing self-confidence in STEAM.

Having a flexible attitude, resilient, not easily discouraged. Student ability has a measure that must be considered, and failure is the limit where students can do and still have to try again. The teacher's role is to guide students to keep trying.

4. CONCLUSION

After obtaining data analyzing and considering from various literature, the researcher can conclude this research as follows; Student confidence can be improved by STEAM-based learning, with the correct control of a teacher. Student confidence is very important to control because student success can be influenced by self-confidence. The implication of this research is that teachers must be able to prepare all situations to guide, control, facilitate, and foster confidence in physics. STEAM learning can be an option to increase student confidence.

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