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Implementation of Mathematics Learning through OFPISA Model in Vocational High School of Banten Province

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ABSTRACT. This study aimed to analyze the implementation of the OFPISA learning model in the mathematics learning of vocational high school students. The method used in this study is a combination method. Two schools were used as research samples with a focus on learning the OFPISA model. The research data use triangulation techniques, namely by observation, interviews, and documentation. The test is used to analyze whether or not there is an increase in students' mathematics learning outcomes after implementing OFPISA learning. The results showed that the OFPISA model in mathematics learning for Vocational High School students could empirically improve students' creative thinking skills, increase students' enthusiasm and motivation to learn so that their learning outcomes also increased drastically, were able to find goals, facts, problems, ideas, solutions, and student admissions.

Keywords: *Mathematics Learning, OFPISA Model, Vocational High School*

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INTRODUCTION

The learning process needs to be planned so that it goes well and achieves the expected results according to the learning objectives that have been set. Planning is concerned with thinking about what to do. A lesson plan predicts the actions that will be taken when carrying out learning. Planning content is organizing and determining learning elements such as objectives, subject matter, methods, tools, resources, and assessment through the curriculum. According to Prihantoro (2015) curriculum is a set of plans and arrangements regarding the objectives, content, and teaching materials and methods used to guide the implementation of learning to achieve specific educational goals. Therefore, creative teachers are needed so that the curriculum goals are achieved. Creative teachers are hard-working, disobedient, knowledgeable, intuitive, confident, flexible, and energetic (Bramwell *et al.*, 2011). Therefore, a creative teacher will see the goals to be achieved and the student's abilities, and then he chooses strategies and methods that are effective and efficient.

In general, mathematics learning in schools aims to shape one's thinking patterns so that they can think critically, creatively, logically, and systematically (Lingefjärd, 2012; Kurniati *et al.*, 2015; Surya & Syahputra, 2017; Imswatama & Lukman, 2018; Rohaeti *et al.*, 2019; Rachmiati *et al.*, 2020; Nuangchalerm *et al.*, 2021). In addition, learning mathematics aims to continue education to a higher level. It is because mathematics is the foundation for mastering other sciences. Mathematical ability is critical to the economic success of a society (Lipnevich *et al.*, 2011). In

addition, mathematics is a core subject in secondary schools; therefore, mathematics learning is established to produce competent people who can apply mathematical knowledge in everyday life effectively and responsibly in solving problems and making decisions (Zakaria *et al.,* 2012). However, based on the results of the study, it was revealed that some of the weaknesses of learning mathematics were that students were unable to connect mathematical concepts in school with their daily experiences (Rahayu & Kusuma, 2019), and teachers were still active and did not provide opportunities for students to build ideas -the idea (Ismail, 2018).

Based on the 2017/2018 national and local vocational high school mathematics exam scores, the results are still far from expectations. It can be seen in Table 1 below.

Table 1. Average National Examination Score
Vocational High School Academic Year 2017/2018

Subjects	National Examination Average Score	
	Province	National
Indonesian	56.00	63.80
English	45.20	40.59
Mathematics	44.49	33.73

Source: Educational Assessment Ministry of Education and Culture

It can be seen from Table 1 above that the average value of the national exam both locally and nationally is still below the average value of Indonesian and English subjects. Therefore, this problem must be found a solution in order to boost the average score, which is still low, especially in mathematics subjects in Vocational High Schools.

The results of another study conducted by Setiawan *et al.* (2017) that the ability to think creatively allows discoveries in science and technology. Creative thinking ability is a person's ability and ability to show variations in possible answers (Siswono, 2016). In other words, creative thinking is original and reflective thinking and produces something (Susanto, 2011; Juhji & Mansur, 2020). When students' creative thinking skills are not stimulated, students are not accustomed to solving problems with various innovative answers. For this reason, students' creativity needs to be honed and developed. The more alternative answers found, the more creative a person can be in terms of thinking, or vice versa. One is that creative thinking ability can be honed and improved through education.

In connection with the above problems, efforts to improve the quality of mathematics learning in Vocational High Schools are an urgent need to be carried out. The application of creative thinking mathematics learning, namely Objective finding, Fact-finding, Problem finding, Idea finding, Solution finding, and Acceptance finding (OFPISA) in Vocational High Schools is an effort to increase students' creativity can boost scores that are still low. Therefore, this study aims to explore the application of OFPISA learning in Vocational High Schools in Banten Province.

METHOD

The research method uses mix methods. This research was conducted at a State Vocational High School in Banten Province. The time used is one year from the preparation of the research proposal until a report is produced. The research subjects were at the State Vocational High School 1 Kragilan and the State Vocational High School 1 Ciruas, Serang Regency, Banten Province. The data collected in the study were then tested qualitatively by using triangulation techniques, namely by observation, interviews, and documentation. The test is given at the end of the OFPISA learning implementation, which is measured quantitatively with a small sample to determine whether or not there is an increase in the mathematics learning outcomes of Vocational High School students.

RESULT AND DISCUSSION

Result

The results of this study began with the orientation period, the first meeting, the second meeting, and the third meeting. The OFPISA model implementation was carried out from the first meeting to the third meeting. The implementation of the OFPISA model in Vocational High Schools is carried out through the following six syntaxes:

Syntax 1: Objective finding. Students are divided into groups. Students discuss the problems given by the teacher then brainstorm some goals or objectives that they can use for their creative work. Throughout this process, students are expected to make a consensus about the goals to be achieved by the group. Syntax 2: Fact-finding; Students brainstorm all the facts that may be related to the goal. The teacher lists each perspective generated by the students. The teacher gives time for students to reflect on what attributes they think are most relevant to the goals and solutions to problems. Syntax 3: Problem finding; One of the most critical aspects of creativity is redefining the subject matter so that students can be closer to the situation to enable them to find more straightforward solutions. One technique that can be used is to brainstorm various possible ways to clarify a problem further.

Syntax 4: Idea discovery; In this step, students' ideas are listed to see possible solutions to the problem situation. It is a critical brainstorming step. Every thought of the students should be respected even though their ideas have no relevance and solution to their problem. Once their ideas are gathered, please take a few moments to sort out their potential and non-potential solutions. The quick and precise sorting of their ideas can generate ideas that can be considered for further explanation. Syntax 5: Solution finding; At this stage, the most extraordinary potential ideas are evaluated together. One way is to brainstorm the criteria and then determine what the solution will be. This criterion is evaluated until it produces a final assessment of the appropriate idea to solve the problem situation. Syntax 6: Acceptance Finding; At this stage, students begin to consider fundamental issues with a way of thinking that has already started to change. Students are expected to have new ways to solve problems but also to achieve success.

Discussion

Orientation Period. In this orientation activity, the researcher observed the school to determine how the teacher at the school carried out the daily learning. Researchers observed the learning process carried out by teachers at Vocational High Schools that were still conventional, namely the lecture method. This conventional method is suspected to be the cause of students' difficulties in understanding the subject matter taught by their teacher so that the average final test result obtained by students is low. The conventional method, which is characterized by lectures, only focuses on reference books to be monotonous (Widiawati & Sofyan, 2013; Nugralia *et al.*, 2019; Mutmainah *et al.*, 2019; Muafikoh *et al.*, 2019). Tayibu and Faizah (2021) state that conventional methods cause students to be less active in the learning process, which can ultimately affect their learning outcomes. In addition, Karlina & Rasam (2020) also stated that teachers who use monotonous learning methods cause students to get bored quickly, less enthusiastic about the material taught by the teacher, even if they think the subjects seem challenging to understand. Therefore, teachers are required to always be creative in the classroom by creating a pleasant learning atmosphere to absorb lessons well.

First Meeting Analysis. By the initial plan that the researcher with partner teachers had planned that at the beginning of learning, the teacher had to do apperception, namely opening learning first by encouraging students to express their initial knowledge about the concepts to be discussed, then followed by questions and answers (Ilyas, 2018; Rahmi *et al.*, 2018; Tusaroh & Juhji, 2020; Ahdhianto, 2020; Maulani *et al.*, 2020; Juhji et al., 2021). Students are allowed to communicate, illustrate their understanding of the concepts studied. However, this aspect is not

carried out by the teacher. According to the researcher's study, there are several reasons why this was not done, including firstly, because this has been the teacher's habit for a long time. After all, during orientation, researchers found something similar. Second, in the first cycle, the teacher was still nervous or embarrassed by the researcher's presence in the class, so because of these feelings, the partner teacher forgot to change his old habits according to the initial plan that had been prepared. It is possible because the process of changing one's habits is determined mainly by self-discipline and persistence (Jazimah, 2014). Based on observations at this first meeting, the stages of the OFPISA learning model for students are not yet clear because this is the first time this model has been tried on them. While the teacher's performance compared to the orientation stage, there has been an improvement in providing interactive questions and answers with students. The average post-test results obtained by students also increased compared to the orientation period.

Second Meeting Analysis. At this second meeting, there has been an improvement from the first meeting. At this second meeting, some students showed a good attitude, such as they began to dare to express their opinions and ideas. The courage to express opinions is essential for students (Shofiyah & Yonata, 2013; Hayati *et al.,* 2016). To encourage and motivate students, the teacher has provided direction and encouragement to them so that they are actively involved in the teacher's learning process in the classroom. Motivation is important because it is empirically proven to affect student learning outcomes and achievement (Baez-Estradas & Alonso-Tapia, 2017; Rafiola *et al*., 2020; Al Haq, 2020). Students have started to take the learning process seriously. This seriousness is the cause of increasing their learning outcomes. According to Aviana and Hidayah (2015) that learning concentration affects the understanding of the subject matter. In addition, learning concentration also has a practical effect on student learning outcomes (Mayasari, 2017; Navia & Yulia, 2017; Astuti *et al*., 2018). Therefore, teachers are required to continuously develop the learning motivation of their students so that their learning outcomes increase. In addition, the average post-test results obtained by students also increased compared to the first meeting.

Third Meeting Analysis. Based on the observations at the third meeting, many improvements have been made by both teachers and students. It is no longer visible the nature of teacher-centred learning; teachers have functioned as facilitators in learning by providing opportunities and services to express their opinions. At this meeting, the teacher had opened the lesson by asking questions and revealing the students' prior knowledge and conveying the learning objectives. It can increase the enthusiasm of students at the beginning of learning. The average results of the post-test obtained by students have increased compared to the second meeting. This increase proves that the OFPISA learning model can increase students' enthusiasm and motivation to learn so that by increasing their motivation, their learning outcomes also increase. In addition, the OFPISA learning model is also able to improve students' creative thinking skills. It is in line with the results of research by Malisa *et al.* (2018). In addition, the implementation of the OFPISA learning model is empirically proven that students can find goals, facts, problems, ideas, solutions, and acceptance (Mulyanah *et al*., 2019).

Learning is a process of changing behaviour in a person, both in terms of knowledge and mentality. Learning outcomes are students' abilities after receiving their learning experience. Learning outcomes are abilities obtained after learning activities so that they can change a person's behaviour. Based on the explanation, it can be concluded that learning outcomes are abilities possessed by students after carrying out the learning process and from their learning experiences so that there is a change in a person's behaviour both in terms of cognitive, affective, and psychomotor aspects. Several factors affect student learning outcomes. The main factor comes from within the students themselves. Each student is believed to have different abilities and talents; on that basis, students' learning outcomes will be different. In addition, environmental factors significantly affect student learning outcomes because no matter how

excellent student learning outcomes are when in a non-conducive environment, it will affect their learning outcomes. The next factor that will affect student learning outcomes is the facilities and infrastructure that support learning itself; less than optimal learning implementation planning and not supported by appropriate learning media affects student learning outcomes. Thus, in designing learning, teachers are very appropriate to prepare to learn well, namely by choosing appropriate and innovative strategies or learning models.

CONCLUSION

The application of the OFPISA model in vocational high school students' mathematics learning can empirically improve students' creative thinking skills, increase students' enthusiasm and motivation to learn so that their learning outcomes also increase drastically, are able to find goals, facts, problems, ideas, solutions, and student acceptance. Thus, these findings suggest that teachers apply the OFPISA model in the students' mathematics learning process in their schools because this model helps them solve mathematics learning problems in vocational high schools.

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