**The PMRI-Based Context of Karate for Elementary School Students during the COVID-19 Pandemic Period**

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Received: Revised: Accepted:

**Abstract**

**The COVID-19 Pandemic has brought many obstaces for education in Indonesia. The learning process in moved from school to learning at home. The negative effect of this learning is that many student find it difficult to learn because the only learn through online platfom without any face-to-face interaction with the teacher. Mathematics lessons that were previously difficult for students are increasingly difficult especially for elememtary students. To increase students' interest in learning mathematics during the COVID-19 pandemic, it is necessary to design new innovations such as the use of the context of karate in mathematics learning . This study aims to improve students’ learning outcomes of third grade elementary schools by developing learning materials using the context of karate based on Indonesian Realistic Mathematics Education with the topic arithmetic operations. This research is a development research using plomp model. Three stages are used in the development of the plomp model: 1) Initial research stage; 2) Prototype stage; 3) Assessment stage. In the initial stages, researchers conducted the data collection and gathered information through observation. In the second stage, the researcher designed the product and evaluated their validity through the expert team. In third stage, the researcher made a revision based on evaluation from the expert team and redo the validation assessment until the expert team states the product is valid for use in learning. The lesson plan, teaching materials and learning video modules are considered valid with the percentage in the range of 78% -100%.**

**Keywords:***Covid-19***,** *Development, Karate, Context, Plomp, PMRI.*

INTRODUCTION

Covid-19 is a new type of disease caused by a novel virus called coronavirus (Yuliana. 2020). A large number of schools, universities, institutions, are closed due to the health crisis that occurs in the world (Purwanto, A. 2020). The learning process at school is replaced by online learning, in which students learn at home through online platform without any face-to-face interaction with the teacher. Such learning is not effective enough because there are many obstacles faced by students in the learning process especially with no direct explanation from the teacher (Puwanto, A. 2020). Mathematics learning requires appropriate methods, so students can understand it easily during the Covid-19 pandemic

Mathematics is very important to learn from the elementary school (Melva. Z, 2019). Mathematics learning is a teaching and learning process designed by the teachers to develop students 'critical thinking and to improve their ability in new knowledge (Susanto, 2013). Students' abilities and creativity should be developed, so they will have the ability to obtain, manage, and use information in the era that is always changing, uncertain and competitive (A. Kenedy, 2019). Therefore, mathematics needs to be taught from elementary school in order to improve students' ability to connect mathematics with the context of everyday life.

Innovation in the learning process during Covid-19 pandemic is needed to increase students’ motivation, especially elementary school students (Dina, 2020). The use of appropriate teaching materials is one good way to develop students’ abilities and creativity in learning. Without using teaching materials, the learning process is less effective (Wulida, 2018). Based on the observation conducted on the third grade students at SDN 22 Koto Tangah Kab. Agam, it was found that 80% of students were more motivated to learn by using new things that attracted their attention compared to the learning process that the teachers normally used. This problem can be used as a reference to make teaching engaging and interesting learning materials. The teaching materials are the resources used by teachers in the learning process in the classroom (Wahyudi, 2016).

The use of karate context is one context that can increase students’ motivation in learning mathematics especially during the Covid-19 pandemic period. Previously, there have been several studies using karate in PISA theory using the PMRI approach to improve students’ learning outcomes in grade X at the high school level (H.Nizar, et al. 2018). Then, the research on mathematics learning used the context of athletic sports in PISA theory and PMRI approach for high school students (I. Pratiwi, 2018). Another research on PMRI approach used lottery coupons as a learning context to improve the learning outcome of junior high school student (W. Yanty, 2016). In this present study, the researcher conducted a study on mathematics learning with the opic arithmetic operations for the third grade students using the context of karate during the COVID-19 pandemic period.

*Pendidikan Matematika Realistik Indonesia* (Indonesian Realistic Mathematics Education) is a learning approach related to the real context of daily life that students have experienced (D. Fitra, 2018). PMRI can make students think more critically because the learning is directly related to the environment around them, and the eachers only plays a role to provide the materials that will be used in the learning process (F. Septiana, 2018). PMRI is applicable to be used in the learning process using the context of karate because it is based on things around students’ environment.

Based on the analysis of several previous studies, the researcher was informed that there is no study using the context of karate for the topic of arithmetic operations. Thus, this study made an attempt to develop valid teaching materials for elementary school students during the Covid-19 pandemic period. By using the context of PMRI-based karate, this study aims to develop mathematics teaching materials for elementary school using the context of karate with the topic of arithmetic operation the Covid-19 pandemic period.

**METHOD**

This research uses development research with plomp model consisting of three stages; 1) the initial research stage, 2) the prototype stage, 3) the assessment stage (Plomp. 2013). In the initial stage, the researcher first analyzed the curriculum and then matched the mathematics materials of the arithmetic operations with the sports context. After that, the data were collected and the initial design of the product or module as the teaching material was started. At this stage, related information was also collected through observation by giving online observation sheets to teachers and students.

The second stage was the formulation of the lesson plan including determining what types of learning activities would be carried out during learning using the sports context. Then, the learning module was designed by collecting sveral materials that would be made into teaching materials, taking picture for the module, and designing worksheets and questions. The next step in this third step was designing the learning video, taking video, and editing it into a complete and interesting learning video. The final step in the second stage was the assessment of the feasibility of the product designed the expert team. The assessment was done through online validation sheets.

In the third stage, after the product was validated by the expert team, the researcher was informed about its drawbacks and the necessary improvements to the learning materials developed. After the revision or improvement of the product based on the results of validation, the researcher returned the expert team to revalidate the revised product. This step was repeated until the product was declared valid by the expert.

**RESEARCH RESUTL**

This research started with the current Covid-19 pandemic situation. Previously, researchers had collected information and designed the learning materials for the topic arithmetic operations for the third grade students. From the results of observation and interview with the teachers, the researcher was informed that the learning materials were less creative and less effective before the Covid-19 pandemic. It led to students’ lack of motivation in learning, then it would affect the learning process and outcome (Yullys, 2019). Therefore, it was necessary to develop the learning materials on arithmetic operations for the third grade students.

After the learning material was designed, the researcher created a validation sheet and answer key for the developed learning material. This validation sheet was used to evaluate the developed learning material. Through the results of the evaluator’s validation, the researcher could find out what should improved from the product that had been developed.

The validation used in this study consisted of validation of lesson plans, validation of learning materials, and validation of learning videos. The result of this validation was valid because all components contained in the learning model were well developed. The validator team wereYullys Helsa (YH) material expert, Yunisrul (Y) design expert, Amelia Esanita (AE) lesson plan expert, and Yessy (Y) learning video expert. The validation assessment for the lesson plan is presented in Table 1.

**Table1**. Score for Lesson Plan Validation from all Expert Team

|  |  |  |
| --- | --- | --- |
| Expert Team | Score (%) | Category |
| YH | 83,3 | Valid |
| Y | 94 | Valid |
| AE | 91,9 | Valid |
| Y | 95.8 | Valid |
| Average Score | 91,25 | Valid |

The validation assessment for the learning material is presented in Table 2.

**Table 2**. Score for Learning Material Validation from all Expert Team

|  |  |  |
| --- | --- | --- |
| Expert Team | Score (%) | Category |
| YH | 91,4 | Valid |
| Y | 92 | Valid |
| AE | 93,3 | Valid |
| Y | 94,5 | Valid |
| Average Score | 92,8 | Valid |

The validation assessment for the learning video is presented in Table 3.

**Table 3**. Score for Learning Video Validation from all Expert Team

|  |  |  |
| --- | --- | --- |
| Expert Team | Score (%) | Category |
| YH | 94.7 | Valid |
| Y | 93.9 | Valid |
| AE | 93 | Valid |
| Y | 95 | Valid |
| Average Score | 94,2 | Valid |

Based on the results of the validation in Table 1, the average score is 91.25%, 92.8% in tbale 2, and 94.2% in table 3. This score is in the range of 78% - 100% meaning that the validation result is in valid category. Hence, it can be concluded that the developed learning material is valid for use in the learning process.

**DISCUSSION**

The developed learning materials, lesson plans, worksheets, and learning videos are valid, so they can be used for third grade elementary school students especially during the Covid-19 pandemic period. The topic of arithmetic operation was chosen because the learning materials for this topic were less creative. During the observation, the teacher only focused on the textbook without giving any explanation to students.

With the development of learning materials using the karate context, it can increase students’ motivation to participate in the learning process (M. Minanti, 2019). Karate is not just a means of elf defense or sports but also as a tool for implementing mathematics learning.



**Figure1**. Cover of the Learning Module



**Figure 2.** Screnshoot of the Learning Video



**Figure 3**. Rules of Point Calculation in Karate Match

Figure 3 illustrates the relationship between karate and mathematical operations in which the karate point uses arithmetic operation. There is almos no research using the context of sports, especially karate in the development of learningmaterials. As for learning by using sports context, several research just developed the materials for high school and middle school students. For this reason, this research was developed for elementary school students.

According to PMRI theory, the learning process is conducted based on things directly related to students’ daily activities s (D. Fitra, 2017), so karate can be used as a learning context because children directly learn by using karate.

**CONCLUSION**

Based on the findings of this study, it can be concluded that new innovations in mathematics learning during the Covid-19 pandemic are necessary. The use of sports contexts is among the latest innovations in the development the learning materials for mathematics. Karate can be connected to mathematics learning with the topic of arithmetic operations in this case related to the rule of karate point calculation This point is what connects the two contexts. Therefore, PMRI is very compatible in the context of karate in the development of learning materials.

After the validation test by the expert team as well as several revisions, the developed learning material is valid for use in learning mathematics. Despite this Covid-19 condition, the researcher faced few obstacles in theisstudy, but the researchers managed to test the validity of the developed product, and it was considered valid by the expert team.

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