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Teachers' and Prospective Teachers' Responses to Mentoring in the Creation of RME Learning Tools for Early Childhood Education Students

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Abstract

This study aims to provide assistance related to the development of realistic mathematics education (RME) learning tools and find out the response of teachers and prospective teachers to the results of assistance in developing RME learning tools provided using the context in the surrounding environment. Environmental context can be used for the learning process to understand more real concepts or learning materials. This type of research is descriptive qualitative. This model for implementing activities is a mentoring model to increase teacher professionalism in preparing teaching and learning activities, especially in preparing learning tools, where a basic understanding of theory and its application is required. The data collection techniques used were explanation, question and answer, and evaluation. The number of participants involved was 110 people consisting of teachers from Musi Rawas district and prospective teachers of Sriwijaya University. The result of this service was the successful implementation of RME learning tool development assistance activities for one month using synchronous and asynchronous processes using the Zoom, Google Form and Google Classroom platforms. As well as good responses from teachers and prospective teachers from the results of making RME learning tools using the context in the surrounding environment. With this assistance activity in making learning tools, it can be a solution for teachers and prospective teachers in making learning tools that comply with RME rules and theories.

Keywords: *Context, Early childhood education students, learning tools*

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Introduction

Teachers are one of the most important pillars in the world of education that is closely related to the learning process. Teacher involvement in the learning process can shape students' character, prepare them to face the future, and help them develop their potential (Lukman et al., 2021; Sari, 2021; Yuliyanto & Indartono, 2020). To realize teacher involvement in achieving student success, teachers have an obligation to provide appropriate, sufficient and varied learning resources according to students' needs so that learning objectives can be met (Hakim, 2017). Learning resources that need to be prepared by teachers should be in the form of learning tools.

Learning tools are instruments that a teacher must have in each of their learning. This is stated in Law of the Republic of Indonesia Number 20 of (2003) Article 39 which states that one of the tasks of an educator is to plan learning well. With the learning tools, learning becomes more directed and the goals are achieved as expected (Efriani et al., 2020b). At least the teacher follows the rules in making tools that have been adjusted to the policy.

Ideally, the preparation of learning tools must be well and carefully planned by the teacher before the learning begins (Efriani et al., 2020a). If this is done, then the learning material delivered by the teacher will be received by students according to the expected learning objectives. Without appropriate learning tools, the learning implemented will experience obstacles (Crossley & McNamara, 2016; Qashou, 2022). However, teachers seem to be developing less creativity in

planing, preparing, and developing innovative learning tools that can foster a fun learning atmosphere and be able to develop all the potential of their students (Zuriah et al., 2016). Teachers generally do not understand the principle of preparing lesson plans and only use Lesson Plans (RPP) that have been developed by the Ministry of National Education or the MGMP mathematics (Khotimah, 2017; Mardiah & dkk, 2013). Teachers should not only provide finished knowledge, but also students should actively build knowledge in their own minds (Misdalina et al., 2009). This is because learning tools function to direct the learning process so that it matches the characteristics of the learning design used.

The developed learning tools can be adapted to the appropriate approach according to the characteristics of the students. One suitable approach is the Indonesian Realistic Mathematics Education Approach (RME) because RME is a fun mathematics learning approach and utilizes the environment as a learning resource (Misdalina et al., 2009). Various research results (Apriani, 2018; Bustang et al., 2013; Feriana & Putri, 2016; Khotimah, 2017; Marion et al., 2015; Zulkardi & Putri, 2010) show that the realistic mathematics learning approach is quite effective for improving students' conceptual understanding. Similar things were expressed by Sembiring & Hoogland that learning tools that are in accordance with the characteristics of RME are an important component in the success of realistic mathematics learning, especially supporting students and teachers in problem-solving oriented mathematics learning activities (Nuryami et al., 2021; Putri et al., 2023; Syafriafdi et al., 2019).

The problem encountered in the field is that there is no assistance yet on making mathematics learning tools for PAUD children, so teachers have not been able to make RME-based mathematics learning tools. Based on these problems, it is necessary to provide assistance in making RME-based learning tools. Previous mentoring activities were still related to mentoring in making HOTS-based learning tools, Lesson Study, ICT, and the OST Method (Hendrastuti & Franita, 2021; Khotimah, 2017; Muhali. et al., 2021; Nuris & Suparti., 2018). Meanwhile, for mentoring in making teaching materials with a realistic mathematics approach, it has been done by (Zuriah et al., 2016). However, the mentoring was carried out with fresh graduate alumni subjects and CPNS graduates, and the principles and characteristics of RME were not clearly illustrated.

Therefore, through this research aims to equip teachers with knowledge and skills in preparing learning tools according to their needs and characteristics. Every teacher in an educational unit is obliged to develop complete, systematic learning tools so that learning can take place in an interactive, inspiring, fun, challenging manner, motivating students to participate actively (Reichert-Schlax et al., 2023; Young, 2017). The Indonesian government through the Ministry of Education and Culture still wants to provide educational services for children even though pandemic conditions are currently taking place. Therefore, it is important to provide assistance for both teachers and prospective teachers in making RME learning tools to meet the learning needs of PAUD children.

Method

This research was carried out in a hybrid manner, namely the presentation of material by the speaker was done offline at FKIP Postgraduate Sriwijaya University, while online for the participants. The online activities used the zoom meeting, google form, and google classroom platform. The use of zoom meeting when participants listened to the material presentation by the speaker, then continued with the use of google form when evaluating participants in understanding the material presented by the speaker, and continued with google classroom when assisting participants related to making RME learning tools.

The subjects of this mentoring activity were teachers in Musi Rawas Regency, and there were also several students, both undergraduate and postgraduate Mathematics Education, prospective teacher's of Sriwijaya University. This training was packaged interactively so that there was a two-way interaction for speakers and participants to provide various ideas, suggestions and

experiences. The time for carrying out this activity was one month, coinciding with the presentation by the speaker on September 28, 2021

In this research, to produce RME learning tools for PAUD children in the context of the students' surrounding environment, several methods were carried out, namely explanation, question and answer, and evaluation. In the lecture implementation, the speaker conveyed the form of RME learning tools for PAUD children using the balloon context. The form of tools used to understand the concept of measurement mathematics. Furthermore, questions and answers were asked directly or through the zoom chat after the material presentation from the speaker. Then the exercise aims to provide experience for participants to prepare RME learning tools. Although participants are used to making learning tools, the learning tools made have not necessarily used RME. As the end of this service activity, an evaluation was given in the form of questions related to the material that had been given. This was used to see the participants' understanding in participating in the service activities.

Results and Discussion

Result

This research was carried out by assisting teachers and prospective teachers in making RME learning tools using the context that exists in the surrounding environment of students to understand mathematical concepts and learning problems. In the speaker's presentation, what was discussed was making RME learning tools using the balloon context related to measurement material. This service was carried out with several activities:

Explanation

The delivery of material was carried out to provide an overview of the rules in creating learning tools, especially in early childhood education (PAUD), the principles and characteristics of the Indonesian Realistic Mathematics Education (RME) approach, and providing an example of a RME 'iceberg' using the balloon context for the measurement subject. By providing an overview of RME learning tools for early childhood students, participants can understand more realistic contexts in the students' environment so that mathematics learning can be easily understood and comprehended better.

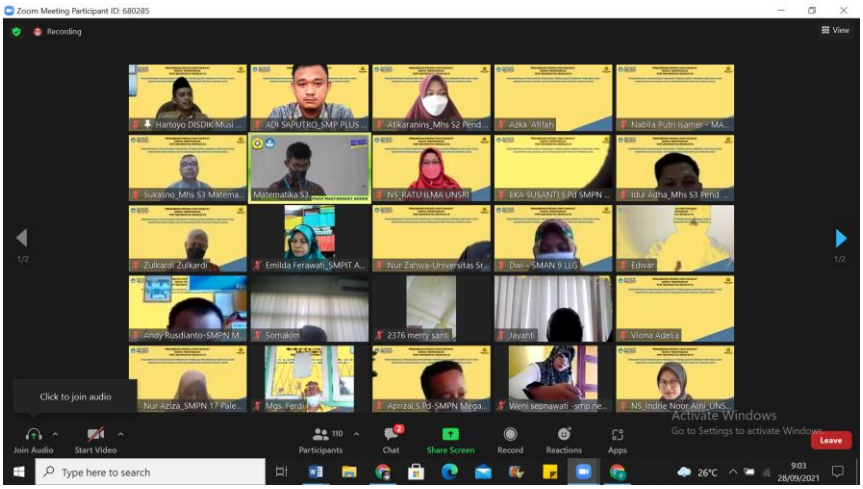

Figure 1. Explanation

Figure 1 above shows the participants in a research with secondary school teachers in Musi Rawas Regency. This activity utilized the Zoom meeting application due to the ongoing COVID-19 pandemic, with a total of 110 participants. They appeared to be very enthusiastic in participating in

the research organized by the Faculty of Teacher Training and Education (FKIP) at Sriwijaya University. The material presented by the resource person can be seen in the following Figure 2:

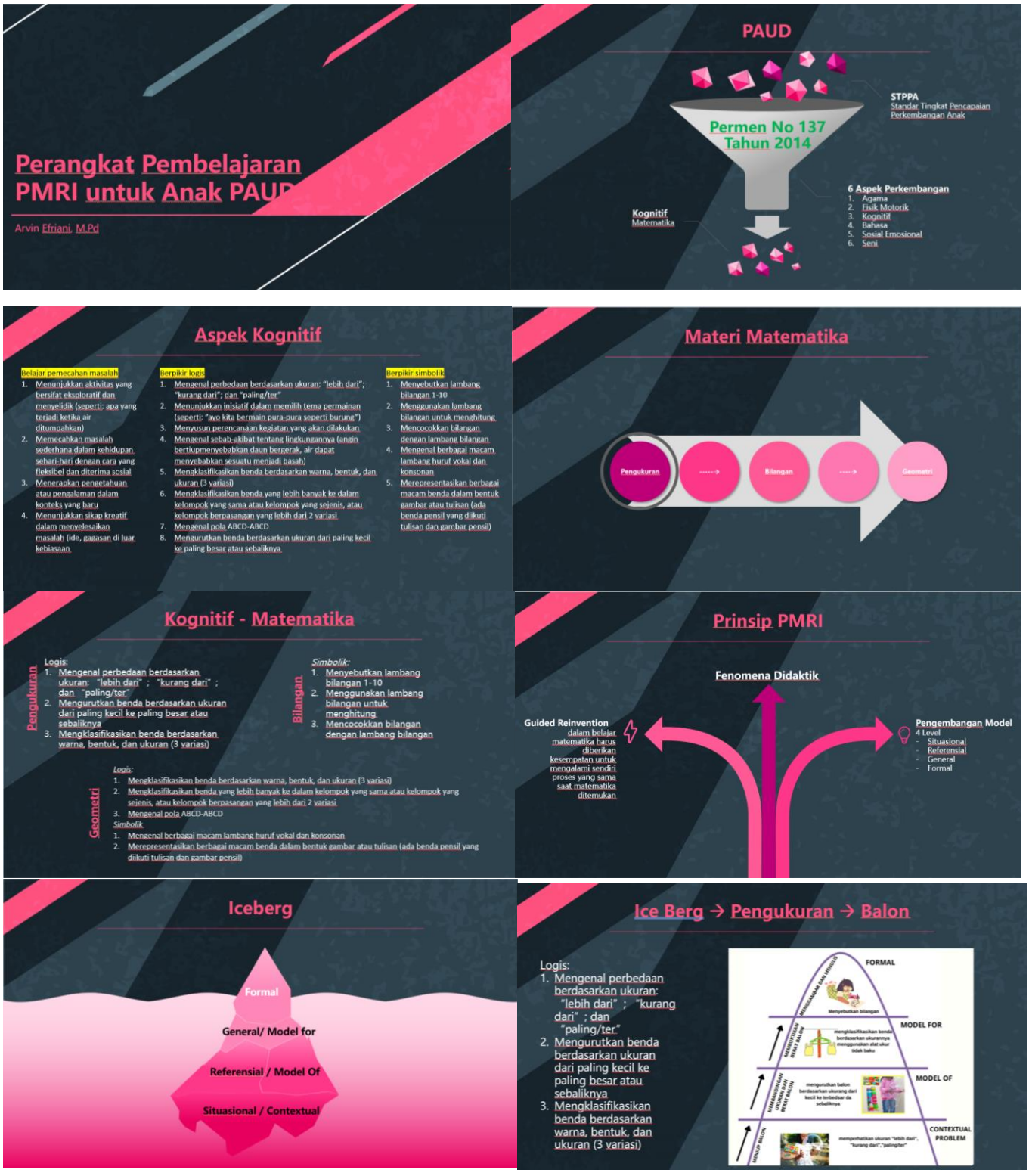

Figure 2. Material Explanation

Figure 2 shows the material explanation from the resource person in the research activity with teachers in Musi Rawas Regency. From the explanation above, it can be seen that the balloon context contributes to enhancing mathematics learning for students. This is also related to the mathematics subject of measurement.

Question and Answer Session

After the material presentation as shown in Figure 2 by the resource person, it was followed by a question and answer session. There were two inquirers regarding the presentation of RME learning tools for early childhood education (PAUD) students. The first inquirer was Mr. Adi Saputro, who asked about the application of RME. One of the challenges he mentioned was that it requires a longer time for students with weaker abilities, while sometimes students with higher abilities become impatient waiting for their peers. He asked how teachers could address this situation. The second inquirer was Mr. Sukasno, who raised a point about early childhood students primarily learning socialization and character development at PAUD, not yet formal thinking in accordance with their cognitive development stage. For children, the main focus should be on learning through play. The speaker responded to both questions, as shown in Figure 3.

Figure 3. Material and Respond from speaker

Evaluation

The activity continued with participants answering evaluation questions related to the material. They were given 5 questions regarding the rules for creating learning tools, especially for early childhood education (PAUD), the principles and characteristics of the Indonesian Realistic Mathematics Education (RME) approach, and determining the RME model related to the examples provided.

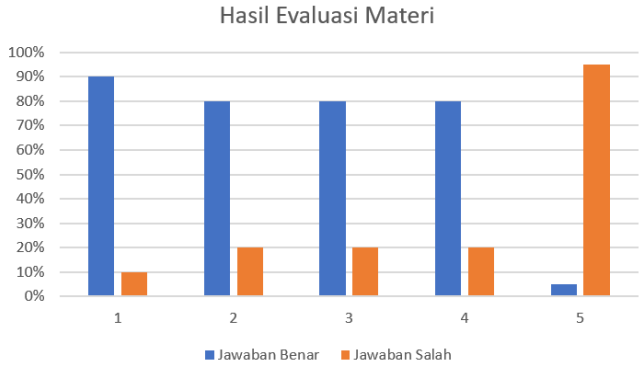

Figure 4. Material evaluation result

As shown in Figure 4, for questions 1 to 4, the research participants did not experience any difficulties and understood what had been presented by the resource person. However, it was different for question number 5 regarding the level model from the given example, where only 5% of the participants were able to answer correctly.

Discussion

This research lasted for a month. The implementation of the research, which included material presentation, question and answer sessions, evaluation, and the creation of RME learning tools by participants, went smoothly. During the material presentation, the resource person conveyed material related to the rules for learning tools as outlined in the Child Development Achievement Level Unit in Ministerial Regulation No. 137 of 2014, which includes 6 aspects of learning development, one of which is the cognitive aspect related to mathematics. Learning in the cognitive aspect is divided into 3 parts: problem-solving learning, logical learning, and symbolic learning. Meanwhile, from the perspective of the mathematical subjects taught, it starts from measurement, numbers, and geometry. These subjects are then grouped according to the division of cognitive aspects, where measurement is related to logic, numbers are related to symbolism, and geometry is related to logic and symbolism.

To deliver the taught material in learning, the Indonesian Realistic Mathematics Education (RME) approach can be used. In RME, the principles and characteristics must be considered. The principles of RME are guided reinvention, which means that in learning mathematics, students must be given the opportunity to experience the same process as when mathematics was discovered; then, the didactic phenomenon; and model development. In model development, there are 4 levels: situational, referential, general, and formal.

The model development according to the RME principle is adjusted to the context used. In the given example, the context used was balloons for the measurement subject. For the first situational (contextual) model, the activity involved blowing up balloons, with the aim of observing the sizes "more than," "less than," and "most/ter." For the referential (model of) model, the activity involved comparing the size and weight of balloons, with the aim of arranging the balloons based on size from smallest to largest and vice versa. For the general (model for) model, the activity involved proving the weight of balloons, with the aim of classifying objects based on their size using non-standard measurement tools. For the formal model, the activity involved drawing and writing, with the aim of having students state numbers.

In working on the evaluation questions given after the material presentation, it turned out that out of the 5 questions, only 1 question did not achieve mastery. Upon further examination, participants had difficulty with the question related to the connection between the question and the model according to the RME principle. This was because there were scientific names that were still considered unfamiliar to the research participants. As a result, participants provided varied answers as shown in Figure 5.

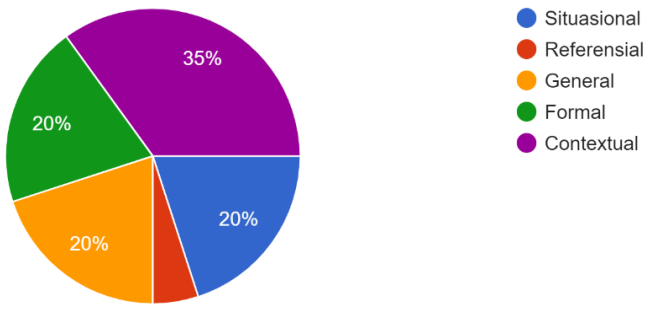

Figure 5. Answers to question number 5 of participants

In research, Muhali (2021) stated that participants were not yet familiar with the learning provided, so ongoing training was needed. Apart from that, mentoring provides material for teacher evaluation of previous learning (Efriani, 2020). Then, after the service activities were carried out virtually using zoom. Assistance in making RME learning tools for PAUD children continues

using Google Classroom. The use of Google Classroom as a form of implementation of learning tools created while analyzing and evaluating the results of service participants. This activity is carried out with the aim that service participants can understand and develop RME learning tools in the context of the surrounding environment.

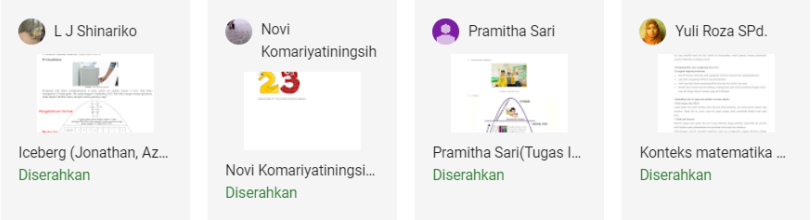

Figure 6. Google Classroom evaluation results

The results in Figure 3 above are a form of evaluation results from participants making RME learning tools for PAUD children using contexts in the surrounding environment. From the assistance in making RME learning tools, it has been carried out as it should, the participants have been able to make learning tools as they have been taught. This shows the importance of this mentoring activity to be carried out with different materials and discussions. This can help teachers prepare the tools needed for teaching and help improve the quality of education in Indonesia by utilizing the context in the environment around us as a starting point in learning.

Conclusion

Assistance in making RME learning devices for PAUD children provides a good understanding of the rules for making devices for PAUD children and RME theory. The results of the evaluation stage in the form of reflections from all mentoring participants showed a good response in improving teacher professionalism. Apart from that, teachers in planning learning do not only refer to existing material, but can develop the context of material related to the child's surrounding environment to improve future learning.

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