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Strengthening Differentiate Learning Using Ethnomathematics in the Implementation of the Independent Curriculum

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Abstract

This community service aims to strengthen teacher knowledge related to differentiation learning. The technology used in this activity results from research in the form of an ethnomathematics application that is used to facilitate teachers in conducting assessments of students to classify students according to learning styles and student characteristics. This community service method is carried out using 3 stages, namely preparation, implementation, and evaluation. The results of this community service activity are 1) the teacher understands techniques and strategies in classifying student characteristics, 2) the teacher is able to use information and communication technology-based learning tools using an android smart tree, 3) the teacher is able to create teaching modules by implementing good practices in differentiated learning.

Keywords: differentiated learning; independent curriculum; ethnomathematics applications; strengthening student character; Pancasila students

INTRODUCTION

The current role of technology can be applied to the educational sector (Heryanto et al., 2021). It becomes important for teachers to master various learning technology devices. Teachers will be helped by the use of learning technology, especially those based on Android smartphones with the use of ethnomathematics applications. Currently, the independent curriculum has been implemented in several schools that are ready to implement it in educational units. Education units must design a curriculum that is adapted to the characteristics of the school and the unique needs of the teaching unit according to the learning outcomes set. Their curriculum requires the teacher's role in implementing differentiated learning (Ultra Gusteti & Neviyarni, 2022).

Teachers can make curriculum adjustments according to student characteristics by focusing on strengthening numeracy and literacy (Jusuf & Sobari, 2022). Ki Hajar Dewantara is a philosophy and values in differentiated learning according to the role of the driving teacher, the vision of the driving teacher, and positive culture (Siagian et al., 2022). Adjustments to interests, learning preferences, student readiness to achieve increased learning outcomes are characteristics of differentiated learning (Pane et al., 2022). So it can be concluded that differentiated learning is learning that adjusts the material and learning outcomes according to the characteristics, initial abilities and learning styles of students. The learning that is applied is a variety of intra-curricular learning, namely prioritizing learning content in exploring and

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understanding concepts and strengthening competence (Syarifuddin & Nurmi, 2022). Content differentiation is related to what is understood and learned by students, process differentiation is related to obtaining information for student learning, and product differentiation is related to what students have learned and understood (Evendi et al., 2023). Student-centered education emphasizes more on aspects of the process of how students learn and the effects of the learning process on the development of the students themselves (Suwartiningsih, 2021). Learning style is an individual's way of absorbing and processing information easily according to their abilities (Alhafiz, 2022). Differentiated learning provides the needs needed by students (Muslimin. Muslimin et al., 2022). Based on this, it can be concluded that it is important for the teacher to understand the things that are important in differentiating learning activities.

Mathematics teachers currently need reinforcement and deeper knowledge related to differentiated learning. Starting from the initial student assessment technique, making pickle modules, determining learning outcomes according to student characteristics. The reality on the ground, based on discussions with partners, is that reinforcement is needed with regard to differentiated concepts and learning contexts so that mathematics teachers can provide the best for students in achieving predetermined learning outcomes.

METHOD

This community service has three stages: preparation, implementation, and evaluation (Mekar Ismayani et al., 2020). Details of the stages of community service activities are as follows:

- Preparation, includes activities by carrying out coordination activities related to the analysis of the problems that partners are facing. Next, discuss the needs and solutions offered to partners. After mutually agreeing on the problem to be solved and the solution technique, namely the mathematics teacher at the SMP Mathematics MGMP in Depok City requires reinforcement related to differentiated learning. After that, coordinate with the supervisors and coaches of the MGMP to determine the location of activities, time of implementation, permits for teachers who will take part, resource persons and a rundown of events to be carried out.
- Implementation, the implementation will be carried out on 18-19 August 2023 which is located at SMP Negeri 6 Depok. This activity is presented with the first material, namely the introduction of the concept of differentiated learning, identification of residual needs and different approaches and techniques of class mapping and class grouping. The second material is a differentiated learning strategy for mathematics, the third material is the use of ICT in differentiated learning activities with ethnomathematics applications. And the fourth material is good practice of using Geogebra and preparing lesson plans, group discussions in preparing differentiated learning plans. And the last is the presentation from each group related to the results of the differentiated mathematics learning plan.

Evaluation, the activities carried out in the evaluation are to reflect on the activities that have been carried out. The teacher compiles questions to be included in the ethnomathematics application and the teacher compiles a differentiated learning plan and evaluates the form of feedback on the activities that have been carried out, the resource persons and the material that has been presented.

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RESULTS

This community service activity was carried out on the basis of evaluation study material for the chairperson of the Middle School Mathematics MGMP in Depok City. There are several things that are part of the problem, namely that there are still teachers who do not understand related to the independent curriculum. Teachers still don't understand how to apply differentiated learning to the mathematics learning process in the classroom. To overcome these problems, the Abdimas implementing team together with the Head of the Middle School Mathematics MGMP in Depok agreed to collaborate in workshops on implementing ethnomathematics-based differentiated learning in the implementation of the independent curriculum.

After the activities have been agreed upon, the next step is for the implementation team and the head of the MGMP to coordinate with the supervisors and supervisors of the Mathematics MGMP in Depok City, represented by Mrs. Desi Idiawati, S.Pd., MM. To determine the number of Participants and anyone who represents the school in workshop activities and determine the time and location of the workshop activities to be carried out. After meeting, it was determined that the workshop activities would be held on 18-19 August 2023 at SMP Negeri 6 Depok. As for the material to be delivered, there are 4 main materials, namely 1) Introduction to the concept of differentiated learning, identification of student needs and a differentiation approach, class mapping techniques and student groupings. 2) Differentiated Learning Strategies for mathematics lessons. 3) Various good practices in Differentiated Learning. 4) The use of ICT in learning activities is differentiated from ethnomathematics applications. 5) Good practice in using Geogebra and preparing lesson plans and group discussions in preparing differentiated learning plans.

The activity was attended by 30 math teachers representing schools in Depok City, namely 25 public junior high school teachers and 5 private junior high school teachers. This activity was opened by representatives of the supervisors and supervisors of the Middle School Mathematics MGMP by giving remarks and directions related to the activities to be carried out. The activities were carried out for two days filled with various materials with competent speakers.

The activity begins with material related to the introduction of differentiated learning which contains examples of differentiated learning activities. Techniques and how the teacher classifies students based on learning styles and interests related to the teaching material that will be delivered by the teacher. Look at the initial assessment of students' ability to learn mathematics. In this activity, it can be seen that there are still teachers who find it difficult to distinguish which includes differentiated learning and which does not include differentiated learning. After the teacher understands what differentiated learning is, the teacher is then invited to see various examples of good practices in differentiated learning activities. The resource person gave an explanation related to the resource person's experience as a junior high school mathematics teacher to provide examples and apply good practices in mathematics learning activities in class. The third material relates to the strategy and the right way to apply differentiated learning to suit the initial interests and abilities of students so that the teacher can classify and provide learning treatment according to the needs, interests and talents possessed by students in studying mathematics.

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Enter the next material, namely the use of ICT in learning mathematics using ethnomathematics applications. This application is the result of research from the Chief Executive of Community Service which can be used as a learning medium for students who are used to conduct an initial assessment of abilities and learning styles that students usually do at school or at home when learning mathematics. Teachers are given the opportunity to fill in additional material and practice questions on ethnomathematics applications as part of developing ethnomathematics application content that can be used for mathematics learning activities. The next material is practice in using the GeoGebra application and preparing lesson plans/modules on one of the materials in the independent curriculum with a differentiated learning strategy.

Based on the material presented, it was seen that the teacher was very enthusiastic in participating in the workshop activities which lasted for two days. It has been seen from the beginning that the teacher still does not understand how to apply differentiated learning in learning plans with this activity and has begun to dare to make and discuss in designing teaching modules/differentiated learning activity plans.

Evaluation activities are carried out by reflecting on the activities carried out by the participants. Participants provide input in the form of filling out assessment questionnaires or feedback on the implementation of activities, resource persons and materials that have been submitted. Good practices are carried out in the form of simulations of workshop participants to be able to apply what has been presented so that it can be useful in classroom learning activities. Through differentiated learning leads students to become what is expected by educational ideals which of course adjusts to meeting the learning needs of students according to their psychological and sociological nature (Kurniawaty et al., 2022). The best learning for students at school will have a tremendous impact on developing student potential in this educational process (Aprima & Sari, 2022). On this basis, the importance of teachers in mastering differentiated learning as part of an effort to classify students according to learning styles and learning outcomes so that the success of teachers in carrying out learning activities for students achieves maximum student learning outcomes.

CONCLUSIONS AND RECOMMENDATIONS

The conclusions related to community service activities that have been carried out are: it is important for teachers to be able to master related concepts and contexts of applying differentiated learning, especially in mathematics. The importance of teacher efforts in mastering learning technology and its use in mathematics learning activities. Good practices need to be applied in every learning activity that the teacher does in class to provide motivation to learn in students.

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APPENDIX

Figure 1. Group photo with resource persons and workshop participants

Figure 2. Photos of good practice activities in making differentiated lesson plans

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