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The Skills of High School Mathematic Teachers in Utilizing the *Merdeka Belajar* Plafform

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Abstract

Post-pandemic education recovery begins with breakthroughs according to changing times and technology. Educators are required to be more creative and innovative and carry out learning appropriate to the characteristics of students. This research was to determine the skills of mathematics teachers in utilizing the *Merdeka Mengajar* platform and how the quality of mathematics learning. The researchers used mixed method research, which combined quantitative and qualitative methods. The population in this research consisted of 135 people, with a total of 27 schools (16 private schools and 11 public schools). This research used the cluster random sampling technique with a sample of 36 teachers from 12 schools (6 private and 6 public schools). The research results showed that the mathematics teacher's skills in utilizing the *Merdeka Mengajar* platform were in the "not good" category. The quality of learning did not increase, and more students obtained learning outcomes under the *KKTP* (Criteria for Completeness of Learning Objectives).

Keywords

learning quality, Mathematics, *merdeka mengajar* platform

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Introduction

The pandemic period has provided many valuable experiences for all sectors, including the education sector. Before the pandemic, learning was carried out face-to-face in schools, and the utilization of information technology was not optimal. Since learning from home was implemented, teachers have used various ways to carry out learning (Collantes et al., 2022; Velasco et al., 2022; Yulianti, & Mukminin, 2021). One of the examples is using information technology. Technology-illiterate teachers experience problems when learning online, so it cannot run as expected. The existence of this learning-from-home policy has not been matched by the ability of teachers to utilize information technology in learning, resulting in a learning loss.

Education is a valuable future investment, so it needs special attention (Welsh et al. 2003). The government has committed that education for future generations must begin and be prepared well (Marsound, 2020). For this reason, the process of preparing future generations must be accompanied by the preparation of professional teachers through a quality and accountable teacher education system (Suryadi, 2019). The teacher is the spearhead in the world of education and a role model for students (Kismeina et al., 2021).

Over time, the pandemic changed its status to endemic. School activities are back to normal with strict health protocols. Several policies in education were published in the *Merdeka Belajar* program. It aims to make the education unit can apply learning that is pro-student (Daniatun et al., 2022). One of the programs launched by the government in the implementation of *Merdeka Mengajar* is the *Merdeka Mengajar* Platform.

It was to determine the skills of mathematics teachers in utilizing the *Merdeka Mengajar* platform and how the quality of mathematics learning. The government's goal to develop the *Merdeka Mengajar* platform is to make teachers can learn independently without having to go through special training or workshops. Teachers' creativity becomes paramount when learning independently through the *Merdeka Mengajar* platform. The awareness and commitment of teachers to genuine and consistent independent learning greatly influence the success of teachers in utilizing the *Merdeka Mengajar* platform. Likewise, the support of school principals through the provision of learning infrastructure to provide space and time for teachers to learn as broadly as possible is in line with the concept of teachers being lifelong learners. This research was to determine the skills of mathematics teachers in utilizing the *Merdeka Mengajar* platform and how the quality of mathematics learning.

Literature Review

The *Merdeka Mengajar* platform is one of the government's efforts to overcome learning loss. This platform will become a teacher's friend in teaching, helping teachers innovate to create learning according to the challenges of the times. The *Merdeka Mengajar* Platform is a platform for teachers that will develop into a platform that is not only ministry material and content but belongs to teachers, from teachers to teachers. In addition, *Merdeka Mengajar* encourages teachers to create and share learning methods (Dharma et al., 2020) to become a reference for teachers to develop teaching practices. This platform has three

functions, which are helping teachers to teach, learn, and work in which there is also an assessment toolkit to measure student learning outcomes. The data can be used to analyze the students' competence in each class.

The *Merdeka Mengajar* platform provides equal opportunities for teachers to continue learning and developing their competencies whenever and wherever they are. The learning feature on the *Merdeka Mengajar* platform provides independent training facilities with opportunities for teachers and education staff to obtain quality training materials by accessing them independently. Another feature of learning is the inspiration video. This feature provides an opportunity for teachers and education staff to get a variety of inspirational videos to develop themselves with unlimited access, which in the end is to develop the quality of their competence in implementing the Merdeka curriculum (Widana, 2020).

The *Merdeka Mengajar* platform encourages teachers to continue working and provides a platform for sharing good practices. Another feature is 'work' which provides "proof of my work", which is a practical best of the results of the implementation of learning, especially related to the best practice of learning in the independent curriculum. Teachers and education staff can build portfolios of their work, so they can share inspiration and collaborate so that teachers can move forward together. In this feature, teachers can motivate each other to give appreciation for the real work that has been created by teachers from various regions. In addition, the *Merdeka Mengajar* platform can inspire teachers to continuously improve their performance quality to provide the best service to students.

The *Merdeka Mengajar* platform developed is expected to be able to become a teacher partner in implementing the Merdeka curriculum with a spirit of collaboration and sharing. The contents by the Ministry of Education and Culture provide a better understanding of the implementation and learning in education units that have participated in the Merdeka curriculum implementation. The features presented on the *Merdeka Mengajar* platform should be utilized optimally by teachers to increase their professionalism in carrying out the learning process. The learning quality can be improved through independent learning conducted by teachers through the *Merdeka Mengajar* platform.

This *Merdeka Mengajar* platform will help teachers implement innovative mathematics learning in the classroom to achieve student-centered learning expectations. Mathematics is a science or knowledge about learning or logical thinking that is needed by humans to live which underlie modern technology development (Siregar, 2017). Mathematics has a crucial role in various disciplines and advances human thinking (Putri et al., 2019). Mathematics is a learning material that must be understood and a conceptual tool for constructing and reconstructing the material, honing, and training the thinking skills needed to solve problems in life (Nurhasanah et al., 2022). Learning mathematics can improve students' ability to think logically, analytically, systematically, critically, and creatively (Rosnawati, 2021). These competencies are needed so that learners can acquire, manage, and utilize information to survive in conditions that are always changing, full of uncertainty, and competitive (Loviasari et al., 2022).

Mathematics subject provides students with ways of thinking, reasoning, and logic through definite mental activities that form a continuous flow of thinking, so it creates a flow of understanding of mathematics learning material in the form of facts, concepts,

principles, operations, relations, problems, and definite mathematical solutions which are formal-universal (Sumandya et al., 2021). This mental process can strengthen the disposition of students to feel the meaning and benefits of mathematics and learn mathematics as well as moral values in learning Mathematics, including freedom, skill, judgment, accuracy, systematism, rationality, patience, independence, discipline, perseverance, and toughness, self-confidence, open-mindedness, and creativity (Sumandya et al., 2020). Thus, its relevance to the profile of Pancasila students, the mathematics subject is to develop students' independence, critical reasoning abilities, and creativity (Sumandya & Widana, 2022). The learning material for Mathematics subjects at every level of education is packaged through the study of numbers, Algebra, measurement, Geometry, data analysis and opportunity, and Calculus (Sumandya, 2019).

In this research, the measured aspect was the Merdeka Mengajar platform utilization. It is done under the new learning paradigm, where students have returned to school by utilizing technology and adapting to the characteristics of each school. This research used the TPACK concept as a theoretical framework with three aspects, consisting of technology, pedagogy, and content, and how the three sources are applied according to the context. TPACK (Technological Pedagogical Content Knowledge) is teacher knowledge about how to facilitate student learning of particular content through pedagogical and technological approaches (Innaha Ruri, 2018). Several variables affect TPACK, namely Technological Knowledge (TK); Pedagogical Knowledge (PK); Content Knowledge (CK); Technological Content Knowledge (TCK); Pedagogical Content Knowledge (PCK); and Technological Pedagogical Knowledge (TPK) (Anugrahana, 2020).

Several relevant studies that have been carried out previously include research conducted by Innaha Ruri (2018), which aims to determine the TPACK (Technological Pedagogical and Content Knowledge) capabilities of Science Teachers at Inclusion Schools of SMP Negeri 23 Surakarta in the 2017/2018 Academic Year. The results showed the TPACK ability of science teachers at the inclusion school of SMP Negeri 23 Surakarta was 41.7%, which categorized the poor category. In addition, Kismeina et al. (2021) also conducted research on the skills of Mathematics teachers throughout Kuningan Regency in utilizing online learning platforms during the pandemic. Researchers used the cluster random sampling technique with a sample of 25 teachers from 10 schools (5 public and 5 private schools). The research results showed that teachers' skills in the context of ICT were in the "poor" category. The quality of learning tends to decrease, and character values decrease. The results of this research are the reason for conducting further research on the use of the *Merdeka Mengajar* platform developed for mathematics learning.

Based on the relevant research results above, the novelty of this research compared to previous research lies in the Technological Pedagogical Content Knowledge (TPACK), which focuses on Technological operations on the *Merdeka Mengajar* platform. This focus is to prepare teachers more regarding the use of technology in learning in line with the development of the industrial revolution 4.0. Teachers should be able to present information technology-based learning through the learning media provision. This research was conducted at the high school level to measure the skills of mathematics teachers in utilizing the *Merdeka Belajar* platform in new paradigm learning.

Methodology

This research used a mixed method, which is an approach that combined quantitative and qualitative methods. Data collection was obtained from numerical information (through instruments) and text information (through interviews) so that the database or results represented both quantitative and qualitative information (Emzir, 2013). The quantitative research phase was to obtain an overview of the skills of mathematics teachers throughout Badung Regency in utilizing the *Merdeka Mengajar* platform. The research was conducted in February-August 2022.

This research focused on the skills of mathematics teachers in the context of ICT so that they only used variables with a technological approach. The three variables used include Technological Knowledge (TK), Technological Content Knowledge (TCK), and Technological Pedagogical Knowledge (TPK). These three variables will be used as operational variables to measure the teacher's ability level in utilizing the *Merdeka Mengajar* platform in learning which is used as a research instrument. With this TPACK, teachers are expected to be able to make good use of technology so that learning can run better. In addition, it can be used as a teacher's assistant media in facilitating students' understanding of learning content, specifically abstract mathematical content by considering pedagogical aspects.

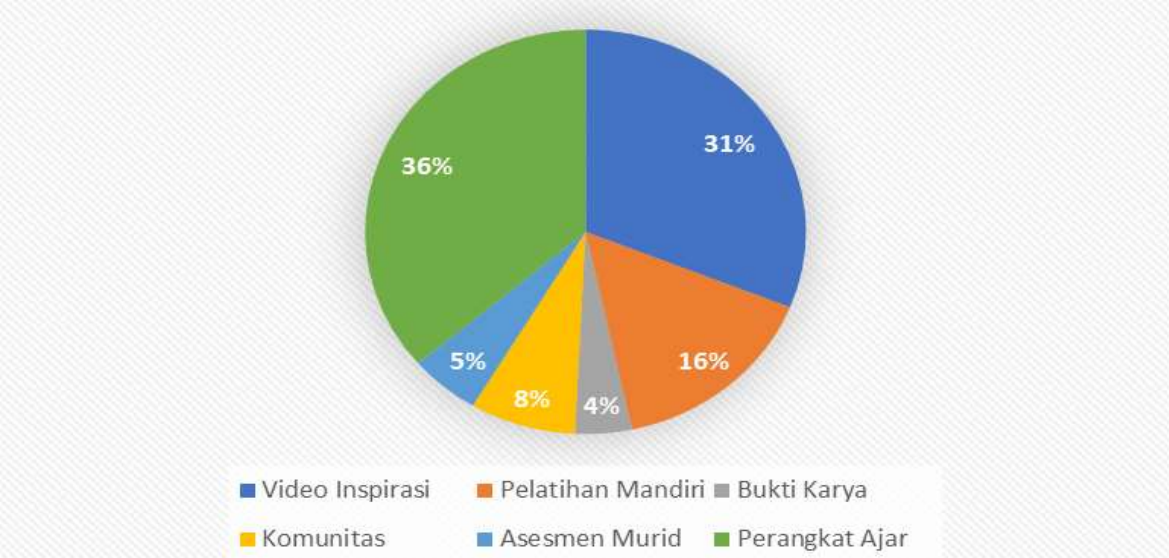
The population in this research was high school mathematics teachers in Badung Regency, consisting of 27 schools with 16 private schools and 11 public schools with 135 mathematics teachers. Meanwhile, the sampling technique used in this research was the cluster random sampling technique because it consisted of private and public schools. The sample used was 36 teachers from 12 schools (6 private and 6 public schools).

This research used questionnaires, interviews, and documentation as the instruments. The data analysis technique used was descriptive quantitative. Before being used, the instrument was tested for feasibility by testing validity and reliability. The validity test used the product moment correlation formula with rough numbers. The instrument validity showed that from the 35 questionnaire items, there were 9 invalid items and 26 valid items. The reliability test used Cronbach's Alpha formula with a result of 0.843 so that > 0.60, the instrument was declared reliable. Before the teacher, student, and interview questionnaire instruments were used, expert judgment tests were also carried out by several experts in their fields.

Findings and Discussion

The research results showed the percentage of the mathematics teacher questionnaire to measure the skills of teachers in Badung Regency Bali in utilizing the *Merdeka Mengajar* platform based on the features contained in the application. The most frequently used feature is the teaching device, which was 36%. The second was inspirational videos in 31%. The third was independent training in 16%. The community was 8%, Student Assessment was 5%, and last, proof of work was 4%. Data on the use of the *Merdeka Mengajar* platform by high school mathematics teachers in Badung Regency are in the following diagram.

Figure 1. *PMM feature percentage*



Note: *Video inspirasi* (Inspirational videos), *pelatihan mandiri* (independent training), *bukti karya* (performance), *komunitas* (community), *asesmen murid* (student assessment), *perangkat ajar* (teaching media)

Various available features can help mathematics teachers to create differentiated and fun learning for students. However, the existing features have some advantages and disadvantages. Based on the results obtained, the advantages of the *Merdeka Mengajar* platform were (1) The *Merdeka Mengajar* platform can be accessed via Android devices and web browsers, (2) inspirational videos can inspire mathematics teachers in developing student-centered learning, (3) independent training can be done anywhere and anytime. Additionally, it also contains benchmarks for the teacher's understanding of the material being studied, (4) proof of work provides a place to share documentation that describes performance, competence, and achievements while serving as a teacher or principal, as well as being a forum for sharing good practices in learning, (5) student assessments can assist teachers in conducting literacy and numeracy diagnostic assessments, so that they can find out which learning model is applied under the student achievement and development stages, (6) teaching kits contain teaching materials, teaching modules, project modules and textbooks that help teachers find references easily, and (7) community, beneficial for building relationships and collaboration spaces to create student-centered innovative learning.

However, each platform has disadvantages. Based on questionnaire data distributed openly to respondents. The disadvantages of the *Merdeka Mengajar* platform were: (1) not all teachers know how to access the *Merdeka Mengajar* platform, (2) not all teachers know how to apply the diagnostic assessments in the *Merdeka Mengajar* platform, (3) the available inspirational videos are general, not related to real problems that occur in every educational unit, (4) teachers sometimes feel bored when completing independent training, (5) the teacher has not maximized the use of proof of my work as a forum for expressing creativity,

achievements as a teacher, (6) teachers have not been able to take advantage of community features to build collaboration spaces in developing innovative learning, and (7) the available teaching tools are not diverse and still follow the previous teaching tools, so teachers feel confused as to what kind of teaching tools are good to develop.

Besides the advantages and disadvantages described above, the *Merdeka Mengajar* platform also has several obstacles when used by teachers, for instance: (1) not all teachers have adequate equipment, so it cannot be accessed, (2) there are still teachers who are technology illiterate, so they are not used to doing digital literacy, (3) there are still students who do not have adequate equipment so that the diagnostic assessment has not run optimally, (4) students have never been trained to work on a diagnostic assessment using the *Merdeka Mengajar* platform application, (5) lack of internet network, so they cannot carry out online diagnostic assessments.

Based on teacher and student questionnaires about the *Merdeka Mengajar* platform used by mathematics teachers in Badung Regency. Mostly, they can use it, but it has not been optimally used to support learning. From the results of interviews with teachers and students, the *Merdeka Mengajar* platform has not had a significant effect on student learning outcomes. The *Merdeka Mengajar* platform was only socialized in February 2022, so it had not been fully utilized by mathematics teachers in high schools in Badung Regency. The learning style used by teachers still follows the old style. In addition, it is because there are still limited inspirational videos that make teachers have not found many references. Teachers are still confused about developing appropriate teaching tools for the students' characteristics because valid examples have not been found in the *Merdeka Mengajar* platform.

Based on the results of these interviews, the quality of learning has not increased as expected. The learning outcomes obtained by students after online learning have not experienced a significant increase. There are still many students who get a score below the KKTP that has been determined by the teacher. Students are still carried away by the pandemic atmosphere, where students' interest and motivation are still low to take lessons. In addition, the learning model applied by mathematics teachers is less challenging, for example, the teacher explains a topic of study, but the answers to that topic already exist in books or on the internet. Teachers have not been able to practice the theory in the *Merdeka Mengajar* platform fully. From the research results, the conclusion is that the skills of mathematics teachers in Badung Regency in utilizing the *Merdeka Mengajar* platform are in the "Not Good" category.

Conclusion

The research results show that the skills of mathematics teachers in Badung Regency in utilizing the *Merdeka Mengajar* platform are in the “Poor” category with a TCR index of 67.82. It starts with teaching tools, inspirational videos, independent training, community, student assessment, and proof of work. The existence of the *Merdeka Mengajar* platform has not had a significant impact on improving the learning process and student learning outcomes because of several obstacles. They are not all teachers know how to access the *Merdeka Mengajar* platform, not all teachers can apply diagnostic assessments, and the available inspirational videos not being miscellaneous and helpful in learning mathematics,

there is a feeling of boredom when completing independent training, proof of my work has not been utilized optimally, the learning community features have not been utilized optimally, and the available teaching tools have not varied. However, the research results also found positive things related to teaching skills in using the *Merdeka Mengajar* platform, for instance, the *Merdeka Mengajar* platform can be used anywhere and anytime, and there are innovative learning inspirations and learning community that is used by teachers to share an interesting story about learning. Based on the research results about the skills of mathematics teachers in Badung Regency in the utilization of the *Merdeka Mengajar* platform, it is hoped that further research can be developed.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest.

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