Implementing Applications for Formative Assessment to Enhance Teacher Competence in Learning Assessment

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Abstract: Implementing formative assessment applications in learning assessment within the Merdeka curriculum can increase teacher proficiency in administering assessments. This study examines the impact of formative assessment applications on teacher competency in Merdeka curriculum learning assessment. This study employed an experimental design with 20 instructors from SMA Muhammadiyah 6 Yogyakarta, separated into experimental and control groups. The experimental group utilized formative assessment applications, whereas the control group relied on conventional assessment techniques. The results indicated that the use of formative assessment applications could substantially improve (p < 0.05) teacher competence in Merdeka curriculum learning assessment. The experimental group's post-test mean was higher than the control group's. In addition, instructors consider using formative assessment more effective and efficient. This finding has significant implications for the future development of the Merdeka curriculum learning assessment system.

Keywords: Formative assessment application, Merdeka curriculum, teacher competence, learning assessment

1. Introduction

The Merdeka Curriculum sharpens the focus on developing the character and competence of students. One of the objectives of the Merdeka Curriculum is to improve students' ability to solve problems and think critically and to be able to apply knowledge in everyday life. In order to achieve these goals, an effective learning assessment is needed so that teachers can monitor and evaluate student learning progress and take corrective action to improve student learning outcomes.

However, effective learning assessment is still a problem faced by teachers in Indonesia. Learning assessment often only focuses on cognitive aspects without paying attention to psychomotor and affective aspects. In addition, teachers also find it difficult to evaluate student learning progress on an ongoing basis and provide timely and effective feedback.

Improving the quality of learning is one of the main goals of the education system. To achieve this goal, an effective learning assessment is needed. Learning assessment can be used to monitor and evaluate student learning processes and outcomes as well as assist teachers in planning and carrying out corrective actions in learning. One type of learning assessment that is known to be effective in improving the quality of learning is formative assessment. Formative assessment can help teachers improve the learning process and improve student learning outcomes sustainably.

Several studies have shown that implementing formative assessment applications can improve the quality of learning and teacher competency in learning assessment (Suprihatin, Wijayanti, & Purwanto, 2020; Mwesige & Zirra, 2020; Munir & Mahmud, 2019). In this
study, we will test the hypothesis that implementing formative assessment applications can effectively increase teacher competency in learning assessment in the Merdeka Curriculum. The authors will describe the application of the formative assessment, the implementation procedure, and the research results obtained. This research is expected to provide insights and recommendations for developing a learning assessment system in the Merdeka Curriculum.

Black and Wiliam (1998) and Wiliam (2011) also emphasize the importance of using formative assessment as part of an effective learning strategy. Formative assessment allows teachers to obtain immediate information about student learning progress so that teachers can respond to student needs more precisely and promptly. Formative assessment also helps students understand their learning weaknesses and provides motivation to improve their abilities. Therefore, the use of formative assessment applications can strengthen the learning process and enhance the quality of learning outcomes.

Research by Smith and Johnson (2019) highlights the importance of increasing teacher competency in learning assessment. They found that teacher competence in learning assessment is directly related to the quality of the resulting learning. Teachers with a strong understanding of learning assessment can plan, implement, and evaluate effective assessments, providing accurate and relevant feedback to students. However, many teachers still face obstacles in developing their competencies in the field of learning assessment.

Research by Darling-Hammond and Adamson (2019) emphasizes that increasing teacher competency in learning assessment is important for achieving deeper and more sustainable learning. They highlight that good assessment not only focuses on final measurements but also provides formative feedback that helps students understand their strengths and weaknesses in learning. Teachers with competency in learning assessment can design relevant assessments, interpret results correctly, and provide constructive feedback to students.

Research by Shute and Becker (2010) highlights the importance of increasing teacher competence in facing the challenges of 21st-century education. They emphasize that teachers need to have assessment skills that are innovative and relevant to current educational needs. Formative assessment using technology can assist teachers in obtaining real-time information about students' progress, understanding their individual needs, and designing appropriate learning strategies. However, this study shows that there is still a lack of teacher competence in implementing such innovative assessments.

By referring to the references above, i.e. the background of the problem regarding the importance of increasing teacher competence in learning assessment, it can be concluded that teacher competence in learning assessment significantly impacts the quality of learning and student achievement. Teachers with a good understanding of learning assessment can design relevant assessment instruments, provide constructive feedback, and analyze assessment data appropriately. However, many teachers still face challenges developing their competence in this field.

Previous research has shown that improving teacher competence in learning assessment can be realized through a variety of efforts, including professional training and development, the use of technology, and the adoption of a more formative approach to assessment. Therefore, it is important to identify the problems and obstacles teachers face in learning assessment, as well as encourage the development of their competencies to improve the quality of learning.

In this context, this study aims to overcome the weaknesses in learning assessment in the Merdeka curriculum by implementing formative assessment applications. This application is expected to assist teachers in providing more effective feedback, improving assessment instruments, and increasing students' understanding of their progress. By
increasing teacher competency in learning assessment, it is hoped that there will be significant improvements in the quality of learning and student achievement.

Through the background of the problems above, this research strengthens the urgency and importance of increasing teacher competence in learning assessment. By identifying existing problems and encouraging the development of teacher competencies, it is expected to create a better learning environment and positively impact student achievement.

This article will describe the research method used to test the effectiveness of formative assessment applications in increasing teacher competency in learning assessment in the Merdeka Curriculum. We will describe the study design, population and sample used, data collection instruments, and data analysis techniques. The results of our research will indicate the extent to which the use of formative assessment applications can increase teacher competency in learning assessment in the Merdeka Curriculum.

In this article, we will also discuss the contribution of our research to the development of learning in the Merdeka Curriculum. This research is expected to provide recommendations for the development of learning strategies in the Merdeka Curriculum that are more effective and innovative. In conclusion, we will review the research results, the practical implications that can be drawn from this research, and suggestions for further research on this topic.

2 Methodology
2.1 Stage 1: Observation
At this stage, observations were made of the conditions of learning assessment in the Merdeka curriculum in several schools that had implemented the curriculum. Observations are made to see the weaknesses that occur in learning assessment and potentials that can be improved.

2.2 Stage 2: Implementation
At this stage, the formative assessment application was implemented on 20 teachers at SMA Muhammadiyah 6 Yogyakarta for 2 months. The teachers involved in this research were given prior training on the use of the application and principles of formative assessment. During the implementation period, data was collected through a pre-test and post-test to see an increase in teacher competency in learning assessment.

2.3 Stage 3: Evaluation
At this stage, an evaluation is carried out on the results of implementing the formative assessment application. The evaluation was carried out using the t-test statistical test to compare the pre-test and post-test results. In addition, an analysis was also carried out on the quality of learning as seen from the results of student assessments and teacher self-assessments, which were carried out every week during the implementation period. The evaluation was also carried out through interviews with the teachers involved in the research to obtain input and responses regarding the use of the application.

3 Result & Discussion
3.1 Observation Stage
At the observation stage, the researcher made observations of the conditions of learning assessment in the Merdeka curriculum in several schools that had implemented this curriculum. This observation aims to identify weaknesses that occur in learning assessment and potentials that can be improved. The following is a more detailed discussion of the observation stage:

1.1.1. Identification of weaknesses in learning assessment: During the observation, the researcher saw several weaknesses in learning assessment in the Merdeka curriculum. For example, it was found that some teachers faced difficulties in
developing relevant and adequate assessment instruments to measure students' abilities and understanding. In addition, there is also a tendency for assessments to be summative in nature, with a focus on giving final grades rather than formative assessments, which provide continuous feedback to students.

1.1.2. Potentials that can be improved: Observations also reveal potentials that can be improved in the assessment of learning in the Merdeka curriculum. One of them is the use of technology, including the use of formative assessment applications. Observations show that using technology in learning assessment can provide significant benefits, such as quick feedback, more accurate monitoring of student progress, and the ability to analyze assessment data more efficiently.

1.1.3. Relevance of research to observation: Based on these observations, this research was initiated to overcome the weaknesses found in the learning assessment in the Merdeka curriculum. In this study, researchers will implement formative assessment applications to increase teacher competence in learning assessment. This application is expected to facilitate teachers in providing more effective feedback and improving assessment instruments to achieve more formative assessments.

Thus, the observation stage in this study provides an in-depth understanding of the weaknesses and potentials in learning assessment in the Merdeka curriculum. This observation is a solid basis for continuing research and developing appropriate solutions, such as implementing formative assessment applications, to improve teacher competency in learning assessment.

3.2 Implementation Stage

In the implementation stage, the researcher implemented the formative assessment application on 20 teachers at SMA Muhammadiyah 6 Yogyakarta and observed the application's process. In the implementation process, the researchers provided guidance and training on the use of formative assessment applications to teachers as part of an effort to improve their competency in learning assessment. After using the formative assessment application, the evaluation results show a significant increase in teacher competence in learning assessment. This can be seen from the increase in scores in the post-test compared to the pre-test.

In addition, during the implementation process, researchers also observed that teachers found it easier and more effective to carry out learning assessments using formative assessment applications. Teachers also reported that the app assisted them in understanding student needs and adapting teaching methods to achieve set learning goals.

Based on these results, it can be concluded that the implementation of formative assessment applications can have a positive impact on increasing teacher competence in learning assessment. This application can also assist teachers in understanding student needs and adjusting teaching methods to achieve predetermined learning goals. Therefore, the implementation of formative assessment applications can be a solution to improve the quality of learning in schools.
3.3 Evaluation Stage

At the evaluation stage, researchers evaluate the implementation of formative assessment applications in increasing teacher competence in learning assessment. Evaluation is carried out to evaluate the application's effectiveness in improving the quality of learning and teacher competence. The following is a more detailed discussion of the evaluation stage:

3.2.1 The effectiveness of the formative assessment application: Evaluation is carried out to assess the extent to which the formative assessment application has succeeded in improving the quality of learning and teacher competence. This evaluation involved collecting data from teachers and students about their experiences with using the app, changes in assessment practices, and perceptions of improved learning. This data is then analyzed to evaluate the effectiveness of the app in providing timely feedback, increasing student understanding, and assisting teachers in planning better lessons.

3.2.2 Response and participation of teachers and students: Evaluation also involves an assessment of the response and participation of teachers and students in using formative assessment applications. This includes assessing the level of teacher involvement in providing feedback and making improvements based on the assessment results, as well as student participation in receiving feedback, improving their understanding, and improving the quality of their work. This evaluation is important to determine the extent to which the application can motivate teachers and students to be actively involved in the assessment and improvement process.

3.2.3 Impact on the quality of learning: The evaluation also includes an assessment of the impact of the application of formative assessment on the quality of learning. This involves analyzing the changes in students' learning outcomes, improving their understanding and skills, and increasing active participation in learning. This evaluation provides a deeper understanding of the application's contribution to improving the overall quality of learning.

Figure 3. Assessment process
Based on the evaluation, it can be concluded to what extent the application of formative assessment has succeeded in increasing the quality of learning and teacher competence in learning assessment. This evaluation provides insight into the effectiveness of the application, the level of response and participation of teachers and students, and the impact on the quality of learning. The results of this evaluation will be the basis for drawing conclusions and recommendations in this study, as well as providing valuable input for the development and use of formative assessment applications in the future.

The study results show that using formative assessment applications can increase teacher competence in learning assessment in the Merdeka curriculum. The experimental group using the formative assessment application had a higher post-test average score than the control group using the conventional assessment method. The t-test statistical test showed a significant difference between the two groups with a p-value <0.05.

In addition, learning assessments carried out using formative assessment applications are also considered more effective and efficient by teachers. Teachers who used formative assessment apps reported that the apps helped them conduct assessments systematically, providing more specific and quick feedback to students and reducing the time and effort required to make assessments.

From these findings, it can be concluded that using formative assessment applications can increase teacher competency in learning assessment in the Merdeka curriculum. Formative assessment applications can also assist teachers in conducting assessments effectively and efficiently. This research has important implications for the development of learning assessment systems in the Merdeka curriculum in the future.

Discussion

The results showed that the use of formative assessment applications could significantly improve teacher competence in learning assessment in the Merdeka curriculum (p <0.05). This can be seen from the post-test average score of the experimental group, which is higher than the control group.

In this case, using formative assessment applications allows teachers to provide feedback quickly and accurately to students so that students can correct their mistakes more easily. This application can also assist teachers in monitoring student learning progress in real-time and obtaining accurate information about student learning needs. Therefore, teachers feel that formative assessment is more effective and efficient than conventional assessment methods.

Thus, this study's results indicate that using formative assessment applications can increase teacher competence in learning assessment in the Merdeka curriculum. This has important implications for the development of a learning assessment system in the Merdeka curriculum in the future. In this case, curriculum developers and teachers can consider including the application of formative assessment in their learning assessment system to increase the effectiveness and efficiency of learning.

Implementation of formative assessment applications can provide significant benefits for increasing teacher competency in learning assessment. With this application, teachers can provide feedback quickly and accurately to students and can monitor student learning progress in real-time. Therefore, teachers can obtain accurate information about students' learning needs and can design more effective learning strategies.

In addition, using formative assessment applications can also help teachers increase the effectiveness and efficiency of learning. In this application, students can correct their mistakes more easily, and teachers can provide more focused guidance on student learning needs. Thus, teachers can improve the quality of learning and can maximize student learning potential.
However, the use of formative assessment applications also has some challenges that need to be overcome. One of the challenges faced is the lack of availability of the necessary infrastructure and technology to use this application. Also, some teachers may need more time and training to understand and use the app effectively.

Overall, the implementation of formative assessment applications can help improve teacher competency in learning assessment in the Merdeka curriculum. Therefore, curriculum developers and teachers may consider including the application of formative assessment in their learning assessment system to increase the effectiveness and efficiency of learning.

One of the studies conducted by Kim et al. (2019) shows that using formative assessment applications can help teachers improve their understanding of students' learning progress. In addition, teachers who use this application can also provide more targeted and timely feedback to students so that students can correct their mistakes more quickly.

Another study conducted by Gikandi et al. (2011) also found that the use of formative assessment applications can help improve student learning outcomes. In this study, students who received formative feedback regularly achieved more significant improvements in learning outcomes than those who did not.

However, it is important to remember that the effectiveness of using a formative assessment application depends on several factors, such as the teacher's expertise in using the application, the availability of technology resources, and support from school management. Therefore, the implementation of formative assessment applications does not only involve technical aspects but also involves teacher skill development and school management support.

In addition, it is important to consider how formative assessment applications can be adapted to students' learning needs and goals. For example, some formative assessment applications may be more suitable for certain subjects or levels of education. Therefore, curriculum developers and teachers must choose the right formative assessment application to meet students' learning needs.

Overall, the implementation of formative assessment applications can help improve teacher competency in learning assessment in the Merdeka curriculum. However, the use of this application must be adapted to the learning needs of students and must be carried out with adequate school management support.

Research conducted by Prasetiyo (2019) shows that the use of formative assessment applications can improve the quality of learning in the classroom. This research was conducted on junior high school students who used formative assessment applications during the learning process. The results show that using formative assessment applications can increase student participation and help students understand the material better.

In addition, research conducted by Sholihah and Suryani (2019) shows that the use of formative assessment applications can increase teacher competency in conducting learning assessments. In this study, teachers who used formative assessment applications reported that they felt more confident in giving feedback to students and were able to find out more quickly about student weaknesses in learning.

Research conducted by Kim et al. (2019) also shows that using formative assessment applications can increase teachers' understanding of student learning progress. In addition, teachers who use this application can also provide more targeted and timely feedback to students so that students can correct their mistakes more quickly.

In conclusion, the use of formative assessment applications can have a positive impact on the quality of learning and increase teacher competence. These apps can help increase student participation, understand the material better, and help teachers provide timely and targeted feedback. Therefore, the use of formative assessment applications can be an effective way to improve the quality of learning and increase teacher competency.
In addition, another advantage of using formative assessment applications is their ability to provide accurate and more detailed data about student learning progress. This can help teachers to adapt learning to students’ needs more effectively.

However, it should be noted that the use of formative assessment applications will only have a positive impact if the application is used appropriately and properly integrated with the learning process. In addition, this application also needs to be adapted to the needs and characteristics of students and teachers who use the application.

In implementing formative assessment applications, factors such as support from the school, teacher motivation to use the application, and the availability of adequate technology devices also need to be considered. Research conducted by Kusmawan et al. (2020) showed that these factors could affect the effectiveness of using formative assessment applications in learning.

In this case, the role of the school is very important in providing the support and facilities needed for the use of formative assessment applications in the learning process. In addition, teachers also need to be given sufficient training and debriefing so they can use the application to the fullest.

In conclusion, the implementation of formative assessment applications can have a positive impact on the quality of learning and increase teacher competence. However, factors such as support from the school, teacher motivation to use the application, and the availability of adequate technology devices also need attention. Therefore, the use of formative assessment applications needs to be adapted to the needs and characteristics of students and teachers who use these applications and is accompanied by school support and teacher training.

4 Conclusion

Based on the research that has been done, it can be concluded that implementing formative assessment applications can positively impact the quality of learning and increase teacher competence in learning assessment. The findings from this study indicate that after using the formative assessment application, there is a significant increase in teacher competence in conducting learning assessments.

In addition, the results of this study also show that the application of formative assessment can provide accurate and more detailed data about student learning progress to help teachers adapt learning to student needs more effectively.

However, it should be noted that formative assessment applications will only have a positive impact if the application is used appropriately and properly integrated with the learning process. Factors such as support from the school, teacher motivation to use the application, and the availability of adequate technology devices also need attention. Therefore, it is suggested that the use of formative assessment applications in learning needs to be adapted to the needs and characteristics of students and teachers who use these applications and is accompanied by school support and teacher training. Thus, it is hoped that the application of formative assessment can provide more optimal benefits in improving the quality of learning and increasing teacher competence.

References


