Teacher Experiences in the Hots-Based Learning Evaluation Process on Mathematics Material in Elementary Schools

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Abstract

The implementation of classroom learning has consequences for teachers, necessitating improvements in their role and competency. A competent teacher will find it easier to manage the classroom and evaluate students, both individually and as a whole. Teachers can use this information as a decision-making step in determining teaching and learning strategies. Therefore, teachers need to assess students' learning processes and outcomes. Therefore, this paper will examine learning evaluation related to student learning competency achievement, as well as innovations in improving learning evaluation in line with current developments. This study used a qualitative approach with a phenomenological method. Data collection was conducted using in-depth interviews with each participant. The research participants were 15 elementary school mathematics teachers from four districts in North Sumatra. Data analysis was conducted using ATLAS.ti 25.0.1. The results of this study indicate that elementary school teachers have understood the importance of using evaluation questions that stimulate students' higher-order thinking skills, such as the ability to analyze, evaluate, and create. However, in implementing this, teachers are faced with several obstacles, including an incomplete understanding of the HOTS concept, difficulties in developing questions that are appropriate to the cognitive developmental stage of elementary school students, and a lack of intensive training and mentoring.

Keywords: *Teacher; Learning Evaluation; HOTS; Mathematics; Elementary School.*

Abstrak

Penyelenggaraan pembelajaran di kelas mempunyai konsekuensi bagi seorang guru untuk meningkatkan peran dan kompetensinya, karena seorang guru yang berkompeten akan lebih mudah dalam mengelola kelas dan melakukan evaluasi terhadap siswanya baik secara individu maupun di kelas. Hal ini dapat dimanfaatkan guru sebagai langkah pengambilan keputusan dalam menentukan strategi belajar mengajar. Oleh karena itu, guru perlu melakukan penilaian terhadap proses dan hasil belajar siswa. Penelitian ini mengkaji tentang evaluasi pembelajaran terkait dengan pencapaian kompetensi belajar siswa, serta inovasi dalam meningkatkan evaluasi pembelajaran sesuai dengan perkembangan zaman. Penelitian ini menggunakan pendekatan kualitatif dengan metode fenomenologi. Pengumpulan data dilakukan dengan menggunakan wawancara mendalam kepada masing-masing partisipan. Partisipan peneliti adalah 15 orang guru Sekolah Dasar pada bidang Matematika yang berasal dari 4 Kabupaten di Sumatera Utara. Analisis data dilakukan dengan menggunakan bantuan perangkat lunak ATLAS.ti 25.0.1. Hasil penelitian ini menunjukkan bahwa guru

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Sekolah Dasar telah memahami pentingnya penggunaan soal evaluasi yang merangsang kemampuan berpikir tingkat tinggi siswa, seperti kemampuan menganalisis, mengevaluasi, dan menciptakan. Namun, dalam pelaksanaannya, guru dihadapkan pada sejumlah hambatan, antara lain pemahaman yang belum menyeluruh terhadap konsep HOTS, kesulitan dalam menyusun soal yang sesuai dengan tahap perkembangan kognitif siswa SD, serta minimnya pelatihan dan pendampingan secara intensif.

Kata Kunci: Guru; Evaluasi Pembelajaran; HOTS; Matematika; Sekolah Dasar.

INTRODUCTION

Learning evaluation is a key element in the education system, measuring the extent to which students have achieved the established learning objectives. Evaluation plays a role not only in assessing students' understanding of the material taught but also in providing feedback to improve the quality of learning itself (Sosial et al., 2020). In the 21st-century era of education, a more in-depth and holistic evaluation approach is needed that can comprehensively assess students' abilities. One approach currently widely implemented is evaluation based on Higher Order Thinking Skills (HOTS), namely higher-order thinking skills that include analysis, synthesis, and evaluation (Dewanti & Muna, 2023).

HOTS are cognitive skills that involve thinking processes beyond simply memorizing facts or information. These abilities include the ability to analyze, evaluate, and solve more complex problems (Dewanti et al., 2021). The application of HOTS in learning is expected to equip students with the skills necessary to face challenges in everyday life and the future world of work (Wardono, SB Waluya, Scolastika Marini, 2016). In the context of mathematics education at the elementary school level, HOTS becomes very relevant because mathematics materials often require analytical and problem-solving skills that focus not only on mechanical procedures, but also on understanding concepts and applying mathematical principles in various situations (Fitri & Na'imah, 2020).

Mathematics, as a subject that demands a deep understanding of concepts and the ability to apply them to real-world problem situations, is one area that can be optimized for developing HOTS (Ismaimuza, 2011). The evaluation process in mathematics learning, which previously focused on testing basic skills such as

calculating or memorizing formulas, has now shifted to measuring students' critical, analytical, and creative thinking skills in solving more complex and contextual mathematical problems (Zahroh & Na'imah, 2020).

Although implementing HOTS-based evaluation in elementary school mathematics learning has great potential, in practice, many teachers face various challenges (Noviasari et al., 2022). One of the main challenges is a lack of understanding and skills in designing evaluation instruments that can effectively measure HOTS (Hayaturraiyan & Harahap, 2022). Many teachers still use evaluation questions based on memorization and basic understanding, so the evaluations do not fully reflect students' higher-order thinking skills (Nahdiyah et al., 2023). In addition, teachers also often face limitations in terms of resources, training, and time to develop HOTS-based questions, which can ultimately affect the quality and effectiveness of learning evaluations (RimahDani et al., 2023).

Another contributing factor is the lack of clear educational policy support for the implementation of HOTS-based evaluation at the elementary school level, as well as limited understanding of the importance of HOTS among educators, parents, and other stakeholders (Munthe, 2015). Therefore, it is important to gain a deeper understanding of teachers' experiences implementing HOTS-based evaluation in elementary school mathematics. Focus on teachers' perspectives, which are often underrepresented in HOTS-related research. Subject-specific context: Mathematics, which poses distinct challenges in designing HOTS-oriented assessments due to its logical, analytical, and problem-solving nature. Elementary education focus, which adds novelty since HOTS is often considered more suitable for higher levels of education.Exploration of adaptive strategies, such as task modification, use of alternative media, and non-traditional assessment techniques, which have rarely been systematically documented at the elementary level.

This study aims to explore teachers' experiences implementing HOTS-based learning evaluation in elementary school mathematics. The study aims to offer practical insights and recommendations for developing effective, contextual HOTS-based assessment strategies in primary mathematics education. This

research will identify the challenges teachers face, the strategies they use to overcome these challenges, and their perceptions of the impact of HOTS use in learning evaluation. Therefore, this study is expected to provide clearer insights into the role of HOTS-based evaluation in improving the quality of mathematics learning in elementary schools and provide recommendations that can be used to overcome existing obstacles.

By gaining a better understanding of teachers' experiences in implementing HOTS-based evaluation, the results of this study are expected to significantly contribute to the development of educational policies, the enhancement of teacher competency, and the improvement of learning evaluation practices in elementary schools, particularly in mathematics. Therefore, HOTS-based evaluation is expected to be an effective tool in facilitating the development of students' higher-order thinking skills that are relevant to current needs.

RESEARCH METHODS

This study was conducted using a qualitative approach and adopted a phenomenological method to deeply understand the participants' experiences. A qualitative approach was chosen because the focus of this study was to gain an in-depth understanding of the phenomena occurring in a specific context (namely, the HOTS evaluation process in mathematics learning) (Syarifuddin & Harahap, 2021). Data collection was conducted through in-depth interviews conducted individually with each participant. The study subjects consisted of 15 elementary school mathematics teachers spread across four districts in North Sumatra.

The subjects in this study were elementary school mathematics teachers in several schools that had implemented HOTS-based evaluations (Harahap & Harahap, 2022). The selected teachers had experience designing and implementing HOTS-based learning evaluations in mathematics. The research subjects were selected using a purposive sampling technique, which selected subjects based on specific criteria relevant to the research objectives, such as length of teaching experience, understanding of HOTS, and involvement in developing HOTS-based evaluation materials (Dewanti & Muna, 2023).

The primary data source in this study was in-depth interviews with the mathematics teachers who were the research subjects. In addition, additional data was obtained through observations of the teachers' learning processes and analysis of relevant documents, such as HOTS-based exam questions or assignments that had been used in learning evaluations (Harahap & Wahyuni, 2021).

The instrument used in this research is an interview guide designed to explore teachers' experiences in implementing HOTS-based evaluations. This interview guide includes questions about challenges faced in designing HOTS-based evaluations, strategies used to overcome these challenges, and teachers' perceptions of the impact of HOTS on the development of students' thinking skills.

Data in this study will be collected using the following techniques:

a. **In-Depth Interviews:** Semi-structured interviews with mathematics teachers will be conducted to explore their experiences, challenges, and perceptions regarding the implementation of HOTS-based evaluations. These interviews will also be used to gain an understanding of the strategies teachers use in designing HOTS-based evaluations.
b. **Classroom Observations**: Researchers will observe mathematics learning activities involving HOTS-based evaluations to understand how the process is implemented in the classroom. These observations will also assist in obtaining data on interactions between teachers and students during the evaluation process.
c. **Documentation**: Documents used in learning evaluations, such as HOTS-based exam questions or assignments, will be analyzed to determine the extent to which they reflect higher-order thinking skills.

Data obtained from interviews, observations, and documentation will be analyzed using ATLAS.ti software version 25.0.1. ATLAS.ti will be used to code and organize qualitative data to facilitate the identification of key themes emerging from the data. The data analysis procedure using ATLAS.ti is as follows:

a. **Data Transcription and Checking:** All interviews and observations will be transcribed and checked to ensure data accuracy.
b. **Coding:** The researcher will code the data by labeling sections relevant to the research objectives. These codes will refer to themes related to the application of HOTS in mathematics learning evaluation.
c. **Categorization:** After the data is coded, researchers will group the data based on emerging categories, such as challenges faced, strategies used, perceptions of HOTS-based evaluation, and factors influencing HOTS implementation.
d. **Thematic Analysis**: The categorized data will be analyzed thematically to identify key patterns and relationships between themes, and to understand teachers' experiences in implementing HOTS-based evaluation (Fajri et al., 2021).

To ensure data validity, this study will use source triangulation techniques, namely by comparing data from interviews, observations, and documentation. In addition, the researcher will conduct member checking, which involves asking teachers involved in the study to verify the findings to ensure the accuracy of data interpretation (Munthe, 2015).

By using this method, the study is expected to provide an in-depth overview of teachers' experiences in the process of evaluating HOTS-based learning in elementary school mathematics, as well as the challenges and solutions they encounter in its implementation (Lukum, 2015).

RESULTS AND DISCUSSION

This study aims to reveal teachers' experiences in implementing HOTS-based learning evaluations in mathematics in elementary schools. Based on data obtained from in-depth interviews, classroom observations, and document analysis, various findings reflect the challenges, strategies, and teachers' perceptions regarding the implementation of HOTS-based evaluations in mathematics learning. The following are the results and discussion of this study.

1. Challenges Faced by Teachers

The teachers involved in this study revealed several key challenges they faced in implementing HOTS-based evaluations in mathematics learning in elementary schools. The first challenge that emerged was a lack of in-depth understanding of the HOTS concept. Although teachers recognized the importance of higher-order thinking skills in learning, many of them found it difficult to identify and design questions that effectively measured students' HOTS abilities. Several teachers admitted that they often focused on questions that assessed basic skills such as understanding formulas or mathematical operations, which were easier to create and more aligned with traditional assessments.

The second challenge is limited time and resources. Most teachers expressed feeling overwhelmed by the sheer amount of material they had to cover in a limited time. Therefore, they tended to prefer simpler and more time-efficient assessments, such as multiple-choice or short answer questions. They also mentioned that although they understood the importance of developing HOTS-based questions, limited training and adequate resources prevented them from implementing them optimally.

The third challenge was the lack of support from education policy. Teachers felt that existing policies did not fully support the implementation of HOTS-based evaluations in elementary schools. Many teachers lacked adequate training on the application of HOTS in learning evaluations. Furthermore, they felt that the HOTS questions designed sometimes did not align with national exam standards, which emphasize testing basic knowledge rather than higher-order thinking skills.

2. Strategies Used by Teachers

To address these challenges, teachers developed various strategies. One key strategy used was collaboration between teachers. Several teachers reported that they frequently discussed with their colleagues to share experiences and tips on designing HOTS-based assessment questions. This

collaboration also helped teachers design more complex questions that were appropriate to students' ability levels.

Furthermore, many teachers utilized digital media and resources as part of the evaluation process. They used online platforms to provide HOTS questions that could assess students' analytical and problem-solving skills. Some teachers also utilized videos or mathematical simulations to explore students' deeper understanding. This helped them reduce their reliance on questions that only tested memorization or basic knowledge.

Another strategy used was adapting questions to real-life contexts. Many teachers attempted to relate HOTS questions to real-world situations relevant to students' daily lives. For example, questions involving cost calculations, measurements, or project planning. By linking mathematics learning materials to real-life contexts, students are expected to think critically and creatively in solving problems.

3. Teacher Perceptions of HOTS-Based Evaluation

The teachers involved in this study had varying perceptions of HOTS-based evaluation. Most teachers acknowledged that implementing HOTS in evaluation can improve the quality of learning and help students develop higher-order thinking skills, which are essential in everyday life. They recognized that HOTS not only helps students understand mathematical concepts but also prepares them to face more complex challenges in the future.

However, some teachers also expressed feeling pressured by the demands of implementing HOTS-based evaluation. Some felt that despite their efforts to design HOTS questions, they still lacked confidence in the evaluation results due to their limited experience and training. Others felt that HOTS-based evaluation was too time-consuming and difficult to implement in every lesson, especially in the context of large classes and the extensive material to be covered.

4. Impact of HOTS-Based Evaluation on Learning

Despite various challenges, many teachers feel that the implementation of HOTS-based evaluation has a positive impact on

mathematics learning in elementary schools. HOTS-based evaluation helps students not only memorize formulas or procedures, but also understand concepts and apply them to more complex situations. Some teachers also report an increase in student active participation, as HOTS problems are often more engaging and challenging for students.

Furthermore, HOTS-based evaluation also helps teachers better understand students' cognitive development. By using HOTS problems, teachers can see the extent to which students are able to analyze, evaluate, and create solutions based on their understanding. This provides more in-depth information about students' thinking skills, which cannot be obtained solely from problems that test memorization.

5. Recommendations for Improving the Implementation of HOTS-Based Evaluation

Based on the findings of this study, several recommendations can help improve the implementation of HOTS-based evaluation in elementary schools:

a. Improved teacher training: Teachers need more in-depth and structured training on the application of HOTS in learning evaluation. This training could include HOTS question design techniques, the use of digital media and resources, and an understanding of how to assess higher-order thinking skills.
b. Support from educational policies: Educational policies that better support the implementation of HOTS in learning evaluation, such as providing awards or incentives for teachers who successfully implement HOTS-based evaluation, will significantly increase teacher motivation to continue developing these skills.
c. Collaboration between teachers: Collaboration between teachers can be strengthened to share best practices in designing and implementing HOTS-based evaluations and discuss the challenges they face in the process.

More effective and sustainable implementation of HOTS-based evaluations is expected to improve the quality of mathematics learning in elementary schools and help students develop the thinking skills necessary to face future life challenges. Risnita Risnita, Dedi Sastradika, Salman Al Farisi (UIN Sulthan Thaha Saifuddin Jambi) Teacher Skills in Preparing Evaluation Instruments: Case Study of Teacher's Understanding to Construct HOTS Instrument. Many teachers demonstrated insufficient understanding of the principles of Higher Order Thinking Skills (HOTS), particularly the distinctions between LOTS (Lower Order Thinking Skills) and HOTS within Bloom's Taxonomy.

CONCLUSION

Based on the results obtained through in-depth interviews, observations, and document analysis, it can be concluded that implementing HOTS-based evaluations in mathematics classes faces several major challenges, but also has a positive impact on the learning process. The challenges faced by teachers include a lack of in-depth understanding of HOTS concepts, limited time and resources, and a lack of adequate educational policy support. The implementation of HOTS-based evaluations can significantly improve the quality of mathematics learning in elementary schools and prepare students with the higher-order thinking skills essential to facing future challenges.

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