

Assessing Elementary Teachers' Competence in Designing HOTS-Based ANBK Items: A Case Study in Cluster I, Sungaipua District

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ABSTRACT

Teachers are expected to possess a range of professional competencies, one of which is the ability to design effective learning evaluations. This study investigates the ability of grade V teachers to develop Higher Order Thinking Skills (HOTS) questions aligned with the National Assessment (ANBK), the steps they follow in question development, and the challenges they encounter in the process. A qualitative case study approach was employed, involving one group of four elementary schools in the Sungaipua Cluster 1. Data were collected through observation, interviews, and documentation. The analysis followed the Miles and Huberman model, consisting of data reduction, data display, and conclusion drawing. Findings reveal that most grade V teachers lack the necessary skills to construct ANBK-based HOTS questions. This is attributed to varying educational backgrounds and a limited understanding of the ANBK framework. Additionally, teachers often bypass the process of developing original question items, relying instead on questions sourced from the internet. Their limited knowledge of proper question design procedures further hampers their ability to develop effective assessments. A key challenge identified is that the lack of teacher proficiency in HOTS question design translates into student difficulties in mastering higher-order thinking competencies. These findings suggest a need for targeted professional development to enhance teachers' understanding and skills in HOTS-aligned assessment practices.

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1. INTRODUCTION

Basic education has a strategic role in building students' critical thinking skills. However, various studies show that learning in elementary school still tends to emphasize the memorization aspect compared to the development of Higher Order Thinking Skills (HOTS) (Abidah et al., 2024; Nurmawati et al., 2022). As a result, many students experience difficulties in reasoning, analyzing, and evaluating information in depth (Najuah et al., 2024; Sinta et al., 2022; Usman & Wijaya, 2024).

High-level thinking involves the analytical, synthesis, and evaluation skills necessary in problem-solving. However, in elementary school, learning methods are still dominated by conventional approaches that emphasize mastery of facts and memorization without providing more complex thinking challenges (Abidin & Tohir, 2019; Riki, 2019; Widada, 2017). This causes students to be less able to develop HOTS skills that are needed in real life.

One of the main factors that causes weak HOTS skills in students is the low ability of teachers to compose questions that refer to HOTS (Apriani et al., 2022; Rizki et al., 2022). Many teachers still have difficulties in designing HOTS-based questions in accordance with Learning Outcomes (CP) and Learning Objectives (TP). This is due to the limited understanding of teachers about the concept of HOTS and the lack of readiness in teaching and assessing HOTS-based learning (Cahya, Herwin, et al., 2023; Mardhatillah, 2023; Martadireja, 2020; Serang et al., 2023). In addition, most teachers have not received sufficient training related to the preparation of HOTS questions, so the assessments carried out tend to only measure low-level thinking skills (Akbar & Biyanto, 2022; Cahya, Pambudi, et al., 2023).

Based on data from various studies, many teachers still experience obstacles in compiling HOTS question instruments (Patras et al., 2023; Shamdas et al., 2023). The percentage of teachers who still face difficulties in understanding and implementing HOTS questions is quite high. This is due to the lack of guidance and assistance in the preparation of questions that are in accordance with national assessment standards. The lack of experience in designing HOTS-based questions also causes teachers to use low-difficulty questions more often than only test memory and comprehension skills (Kunanti, 2020; Muhassanah & Hayati, 2022).

In the context of the Computer-Based National Assessment (Asesmen Nasional Berbasis Komputer/ANBK), the development of HOTS-based items is a critical component in enhancing the quality of educational assessment in Indonesia (Fanani, 2018; Sinta et al., 2022). ANBK is designed to evaluate students' literacy, numeracy, and character competencies through tasks that emphasize analytical reasoning, problem-solving, and critical thinking. Accordingly, teachers' readiness to design effective HOTS-based questions plays a significant role in the successful implementation of ANBK at the elementary level (Putri et al., 2024; Ramadan & Hajar, 2024; Taufik et al., 2023). Previous studies have highlighted the challenges faced by primary school teachers—particularly in rural areas—in developing valid and reliable HOTS-oriented test items.

Observations conducted in several schools within Cluster 1 of Sungaipua District revealed that many teachers still struggle to align HOTS questions with the current curriculum. Common difficulties include designing relevant and engaging stimuli for students and crafting items that effectively assess critical thinking, creativity, and problem-solving skills. These challenges are often linked to limited understanding of HOTS concepts and a lack of professional training in assessment design.

Given this context, an in-depth analysis of grade V teachers' ability to develop HOTS-based questions for ANBK is necessary. This study aims to (1) describe the steps taken by grade V teachers in preparing HOTS-based ANBK questions and (2) identify the key obstacles they face during the process. The findings are expected to inform strategies for enhancing teacher competence and improving the overall quality of learning and assessment in elementary schools.

2. METHODS

This study employed a qualitative approach using a case study research design. The case study method enables an in-depth exploration of a particular social unit—such as individuals, groups, institutions, or communities—by examining its background, current condition, and interaction with its environment.

The research was conducted in four public elementary schools located in Cluster I of Sungaipua District, Agam Regency, West Sumatra Province. The schools selected were SDN 01 Batagak, SDN 08 Talao, SDN 09 Simpangtigo, and SDN 17 Batugadang. Participants were selected through purposive

sampling based on specific criteria: schools within Cluster I of Sungaipua District and Grade V teachers. One Grade V teacher from each school participated in the study.

Data were collected using interviews and documentation techniques. Semi-structured interviews were conducted with the selected Grade V teachers in two separate sessions at each school. Documentation included the collection and review of teacher-made test items (question portfolios) and records of student learning outcomes.

The data were analyzed using qualitative descriptive analysis based on the Miles and Huberman model (Sugiyono, 2019). According to this model, qualitative data analysis is conducted interactively and continuously through three key activities: data reduction, data display, and conclusion drawing/verification. To ensure the validity of findings, data triangulation was employed by cross-verifying interview responses with the documentation of test items and student outcomes.

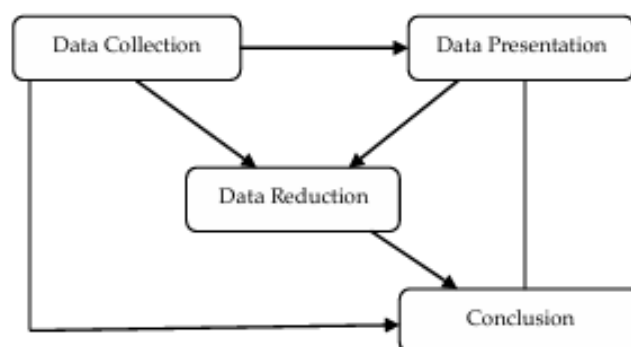


Figure 1. Data Analysis Techniques

3. FINDINGS AND DISCUSSION

3.1 An Analysis of Grade V Teachers' Competence in Designing ANBK-Based HOTS Questions in Cluster I, Sungaipua District

3.1.1 The Condition of Grade V Elementary School Teachers at Elementary School Cluster I, Sungaipua District

The following are the field conditions of grade V teachers at SD Group 1, Sungaipua District, which can be seen in table 1.

Table 1. The Condition of Class V Teachers

No	Name	Institution	Rank	Department	Last Diploma			
					D2	D3	S1	S2
1	VR	SD N 1 Batagak	IX	Primary Education			√	
2	RA	SD N 8 Talao	-	Primary Education			√	
3	SSD	SD N 9 Simpangtigo	IX	Math			√	
4	YF	SD N 17 Batugadang	IX	Primary Education			√	

Based on Table 1, the research data on the condition of teachers in each school that is the subject of the study all have a stratum-1 educational background, as determined by the criteria of three teachers from the PGSD department and one teacher from the mathematics department. From the point of view

of the age of class V teachers in Group I Sungai Pua, the average age is 42 years old. In addition, three teachers, including P3K civil servants, and one teacher are still honorary employees. This research data describes the results of research obtained in field studies with a series of activities, including observation activities, interviews, and documentation of teachers' abilities about the preparation of ANBK-based HOTS questions. So, hereby, the researcher has carried out a series of interviews with each informant concerned.

3.1.2 Readiness of Grade V Elementary School Teachers at SD Group I, Sungaipua District

Teachers' readiness in compiling ANBK-based HOTS questions needs to be considered in order to analyze teacher skills. The indicators of teacher readiness include knowing the ANBK-based question grid, the completeness of facilities and infrastructure. Based on this, the researcher described them sequentially based on the results of the data in the field.

Table 2. Teacher Readiness Table

Sources	Understanding (1-10)	Facility	Digital Access
VR	6	A Library	Incomplete
RA	6	A Library, a wifi	Incomplete
SSD	6	A Library, a wifi	Incomplete
YF	6	A Library, a wifi, 17 Unit Chromebooks	complete

Based on the findings presented in the table, teacher readiness in developing ANBK-based Higher Order Thinking Skills (HOTS) questions can be assessed through three key indicators: understanding, facilities, and digital access. Regarding the first indicator—understanding—data from the four participating teachers revealed an average score of 6 out of 10. This score reflects their level of understanding of HOTS-related concepts, including knowledge of definitions, the cognitive domains of analysis, evaluation, and creation based on Bloom's Taxonomy, the ability to design contextual problem-based questions, and familiarity with different question formats.

Interviews with all four teachers indicated a shared theoretical understanding of HOTS, particularly in relation to Bloom's Taxonomy. However, challenges emerged in the practical application of this knowledge. Teachers reported difficulties in developing contextualized questions that reflect students' real-life environments, such as those grounded in local cultural contexts. Observations of their question development practices confirmed this limitation. Additionally, teachers expressed hesitation in using varied question formats, fearing that alternative types—especially descriptive or open-ended questions—might confuse students or result in lower student performance. As a result, most items created were limited to objective, multiple-choice formats.

In terms of facilities, variations were noted among the schools. SDN 01 had only basic library resources, while SDN 08 and SDN 09 had libraries and school Wi-Fi. SDN 17 was the most well-equipped, with a library, Wi-Fi access, and 17 Chromebooks. These disparities were attributed to differences in school funding and resource allocation.

Lastly, regarding digital access, observations and in-depth interviews revealed that most schools lacked adequate infrastructure to support digital-based assessments. Only one of the four schools (SDN 17) demonstrated sufficient digital readiness, with access to appropriate hardware for ANBK implementation. The other three schools lacked essential equipment, such as computers, which significantly hindered their ability to support teachers in developing and administering ANBK-based HOTS questions effectively.

3.2 Teachers' Obstacles in Compiling Questions

In carrying out their professional responsibilities, teachers may encounter various challenges. The findings of this study indicate that Grade V teachers in Group 1 of Sungaipua District face several obstacles in developing ANBK-based Higher Order Thinking Skills (HOTS) questions. These challenges are outlined and further detailed in Table 3.

Table 3. Results of Teacher Obstacle

Sources	Indicator		
	Difficulty Analyzing the Cognitive Level	Difficulty Making Contextual Stimuli	Facility difficulties
VR	Difficulty combining HOTS levels in Questions	Difficulty designing contextual content	Challenges in integrating into ANBK
RA	difficulty finding content that is appropriate for the cognitive level	Difficulty in creating illustrations that are close to the characteristics of the student	Difficulties in integrating into ANBK
SSD	Difficulty in making a grid according to KKO	Difficulties in developing descriptive questions	Challenges in integrating into ANBK
YF	Difficulty in making the ideal question according to KKO	Difficulty designing adaptive questions from the student's immediate situation	Challenges in integrating into ANBK

Based on the data obtained, it can be concluded that there are many internal problems in teachers, starting from the lack of skills in analyzing appropriate learning outcomes, so that the learning objectives made are not aligned, limited time to conduct an in-depth analysis of learning outcomes due to the high workload as a result of compiling questions to be general and do not consider the diversity of students' abilities, interests, and backgrounds. Not only that, the teacher's lack of understanding of the concept, so the questions that are made simple are not in accordance with cognitive development. Teachers convey difficulties in adapting learning content to diverse levels of student understanding, causing fear for teachers if they give too difficult questions to students. In integrating technology, teachers are faced with obstacles because the facilities owned by schools are very minimal so they cannot be tested on an ANBK basis. However, teachers also conveyed their solutions, including adding insight through participation in training and literature reviews, and forming teacher learning groups.

Discussion

The findings of this study indicate that the ability of Grade V teachers in Cluster 1 of Sungaipua District to develop ANBK-based Higher Order Thinking Skills (HOTS) questions is still limited and influenced by several interrelated factors. These include educational background, teaching experience, school location, availability of facilities, and teacher workload.

First, the educational background of teachers plays a significant role in shaping their competence in assessment design. Although all participating teachers held a bachelor's degree, one teacher had a non-linear background in mathematics, which contributed to a lack of mastery over the technical aspects of ANBK question development. This supports the view of Mustika et al. (2022), who emphasized that pedagogical and professional competencies, supported by relevant educational backgrounds, are crucial for designing effective assessment items. Similarly, Angyanur et al. (2022)

argued that the relevance of one's academic background and professional experience directly impacts the quality of question development.

Second, teaching experience emerged as another key factor. Despite having years of classroom experience, most teachers reported limited exposure to HOTS question construction. They expressed difficulty in creating contextual, challenging items, often relying on questions sourced from the internet. This is consistent with Fadilah and Hayati (2022), who found that insufficient experience and lack of confidence hinder teachers from independently developing quality HOTS items.

Third, the rural location of the schools presents logistical barriers, such as limited access to training and professional development due to transportation challenges. These findings align with Vito and Krisnani (2015), who emphasized the importance of a supportive environment in enhancing teacher competence. Schools in under-resourced areas often lack access to necessary infrastructure and information, further inhibiting teachers' skill development.

Fourth, human resource limitations also pose challenges. The small number of teachers—only six classroom teachers and one principal across four schools—makes it difficult for Grade V teachers to leave their classes to attend training or collaborate on question development. This supports the assertion by Fadilah and Hayati (2022) that low teacher capacity, whether due to staffing or motivation, can hinder the implementation of HOTS-based learning assessments.

Additionally, the study identified specific technical challenges in question development. Teachers reported difficulty aligning learning objectives (CP) with higher-order cognitive processes, especially in creating contextual stimuli. Most prepared items lacked relevant stimuli and were limited to directive questions or unrelated visual prompts. These findings are consistent with Shamdas et al. (2023) and Rohim (2019), who noted that teachers often focus on retrieving materials from the internet and neglect the contextual and analytical elements required in HOTS question design.

Furthermore, student performance issues—particularly in literacy and numeracy—were cited as obstacles. Teachers observed that students struggled with long reading passages and mathematical problem-solving tasks, partly due to unfamiliarity with question formats. This lack of preparedness further discouraged teachers from developing more complex items, creating a cycle of low expectations and limited cognitive challenge.

Despite these constraints, teachers in Cluster 1 have shown initiative in seeking collaborative and capacity-building solutions. Many engage in peer collaboration through teacher working groups (Kelompok Kerja Guru/KKG), which function as platforms for sharing resources and strategies. This approach aligns with findings from Prayogi and Estetika (2019), who highlight the importance of teacher communities in professional development. Sinta, Roebyanto, and Nuraini (2022) also noted that participation in KKGs positively influences teacher competence by fostering shared learning experiences.

To address the technical challenges in HOTS item development, teachers also suggested enhanced access to training focused on cognitive levels C4 (analysis), C5 (evaluation), and C6 (creation), and the need for testing item validity prior to use. Teachers emphasized the importance of both internal motivation and external support in improving their assessment practices.

In summary, while current teacher readiness in designing ANBK-based HOTS questions in Cluster 1 of Sungaipua District remains limited, the findings underscore the potential for growth through targeted support, collaborative learning, and continuous professional development. Addressing infrastructural, pedagogical, and motivational barriers is essential for fostering more meaningful and cognitively challenging learning experiences in primary education.

4. CONCLUSION

This study examined the ability of Grade V teachers in Cluster 1 of Sungaipua District to develop ANBK-based Higher Order Thinking Skills (HOTS) questions. The findings revealed that non-linear educational backgrounds and limited pedagogical training significantly hindered teachers'

understanding and skills in constructing HOTS-oriented assessment items. Inadequate school infrastructure—attributable to low student enrollment and limited BOS funding—further constrained access to professional development opportunities, such as training and seminars. Teachers also faced several obstacles, including difficulties in analyzing and aligning learning objectives, limited time for in-depth preparation due to high workloads, and challenges in adapting questions to accommodate students' diverse cognitive levels, interests, and backgrounds. Furthermore, minimal access to digital tools prevented teachers from integrating technology into ANBK-based assessments effectively. A notable limitation of this study is its narrow focus on a small, rural sample, which may not represent broader educational contexts across different regions. Future research should explore scalable and context-sensitive strategies to enhance teacher competence in HOTS-based assessment design, including the integration of digital platforms and the development of targeted training models that address both pedagogical and infrastructural gaps. It is recommended that schools support teachers by facilitating access to professional development and allocating resources for continuous training, while teachers are encouraged to engage in self-directed learning and peer collaboration to strengthen their assessment literacy. Future researchers may build upon these findings to investigate innovative, practical solutions for overcoming similar challenges in diverse educational settings.

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