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Developing Informational Text-Based HOTS Assessment Instruments via Google Forms: A Needs Analysis in Indonesian Junior High Schools

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ABSTRACT

Critical thinking is a key 21st-century skill that remains underdeveloped among junior high school students in Indonesia, as reflected in low literacy and thinking scores. This study responds to the need for valid, practical, and contextual assessments to measure students' higher-order thinking skills (HOTS), particularly in reading informational texts. This research employed a research and development (R&D) approach using a modified version of Djiwandono's development model. The study included needs analysis, instrument design, expert validation, and field testing. Data were collected from 225 seventh-grade students and teachers at SMP Negeri 1 Sekayu using questionnaires, interviews, and instrument trials. The final product—a HOTS assessment instrument—was delivered through Google Forms. The results indicated that both students (97.3%) and teachers (100%) recognized the need for HOTS-oriented questions, especially those using informational texts. The instrument was validated by experts and showed high validity, reliability, appropriate difficulty levels, and effective item discrimination. Additionally, 92.9% of students found Google Forms easy to use and suitable for digital assessment. This study confirms the feasibility and effectiveness of digital HOTS instruments using informational texts. The developed tool supports critical thinking evaluation and aligns with current curricular goals. It also demonstrates the readiness of schools to integrate digital tools for formative assessment.

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1. INTRODUCTION

Evaluation of the learning process is essential to determine the effectiveness of teaching and learning activities (Sari et al., 2024). The results of such evaluations are not only beneficial for teachers and students but also provide schools with comprehensive data and insights (Nurhayati et al., 2024). The ability to conduct evaluations is a key component of teachers' pedagogical competence, which requires staying up

to date with developments in educational science, methods, and technology (Purnomo et al., 2020; Zhang et al., 2024).

Developing Higher Order Thinking Skills (HOTS) is central to improving both learning quality and assessment practices. Critical thinking, as part of HOTS, is the ability to analyze and evaluate ideas and is vital for preparing students to meet the demands of the future (Liu et al., 2024; Arthi & Gandhimathi, 2025). Teachers are generally supportive of HOTS-based learning approaches (Nurhayati et al., 2023), which align with global education goals in the 21st century (Zhou et al., 2023; Xiao et al., 2025).

Despite its importance, Indonesian students still face challenges in literacy and critical thinking. According to the 2022 Programme for International Student Assessment (PISA), Indonesia ranked 66th out of 81 participating countries (OECD, 2022). These results are partially attributed to the lack of HOTS-based and PISA-type practice questions in regular classroom instruction (Mirandah et al., 2025). Specifically, Indonesian students' literacy skills remain low (Pratiwi et al., 2023), with data from junior high schools in Musi Banyuasin Regency showing an average literacy level of only 56.09% in 2023. This highlights a clear need for more targeted interventions to enhance students' critical thinking and literacy.

Critical thinking helps students engage with problems analytically, develop creativity, improve intellectual abilities, and increase motivation in learning (Hujjatusnaini et al., 2022). The development of HOTS has thus become a major focus in global education reforms (Liu et al., 2024). Previous research, such as by Puspitasari et al. (2021), demonstrated that HOTS-based literacy tasks—such as those contextualized in the Covid-19 pandemic—can improve students' literacy. However, interviews with Indonesian language teachers at SMP Negeri 1 Sekayu revealed that they had never developed HOTS-oriented assessment instruments for informational texts using digital platforms (Zulkardi et al., 2020). This represents a critical gap in current practice, especially as digital reading is increasingly vital for life and work in modern society (Munk et al., 2024; Svedholm-Häkkinen et al., 2025).

Informational texts are particularly relevant for HOTS-based assessment for several reasons. First, they feature prominently in Indonesia's national Minimum Competency Assessment (AKM) at the junior high level (Permatasari & Wijayanti, 2022). Informational texts convey factual knowledge and help build students' insight (Nurhayati, 2022; Nurhayati et al., 2024), and reading comprehension of such texts has been shown to correlate strongly with HOTS (Al-yahyaie et al., 2025). Second, HOTS questions emphasize the application of knowledge in real-world situations (Areski & Pratiwi, 2024) and align with evolving standards of information literacy that demand more complex thinking (Pinto & Segura, 2025). Third, Google Forms offers a simple, accessible, and effective platform for digital assessment, facilitating the design, distribution, and analysis of assessments without requiring advanced technical skills (Sara et al., 2020).

This study is framed by Bloom's Revised Taxonomy, which classifies cognitive processes into hierarchical levels: remembering, understanding, applying, analyzing, evaluating, and creating. The focus of this research is on the higher-order domains—analyze, evaluate, and create—which are central to critical thinking. The study also draws on digital assessment theory, which supports the integration of technology into classroom assessment to enhance learning outcomes and promote formative evaluation.

This study aims to develop a valid and reliable HOTS-based assessment instrument using informational texts and administered through Google Forms to measure the critical thinking skills of seventh-grade students. The research addresses the following questions:

1. How can a HOTS question instrument based on informational texts be developed using Google Forms?
2. What are the validity, reliability, difficulty level, and discrimination index of the developed instrument?
3. How effective is the instrument in distinguishing different levels of students' critical thinking skills?

2. METHODS

This study uses a qualitative and quantitative data analysis approach with a modified development model based on Djiwandono theory (1996). This research is a study that develops informational text-

based HOTS question instruments to measure the critical thinking skills of seventh-grade students.This research aims to produce valid and reliable question products.

The development process involved several steps: defining the purpose and content, choosing the type and format, writing test items, revising them, and finalizing the test. This research followed a modified version of that process through several structured stages.

The first stage was identifying problems and analyzing needs by using interviews and questionnaires to understand students' learning needs and challenges in critical thinking. The second stage focused on designing the instrument, emphasizing higher-order thinking skills (HOTS), independent learning, and real-world contexts.

In the third stage, HOTS-based questions using informational texts were developed based on the needs analysis. A self-evaluation was then conducted to identify and address initial weaknesses. The fourth stage was expert validation, where specialists in content, language, and evaluation reviewed the instrument to assess its quality and relevance to critical thinking competencies.

In the fifth stage, the instrument was tested on 225 seventh-grade students at SMP Negeri 1 Sekayu using purposive sampling. The aim was to assess the instrument's effectiveness, validity, reliability, difficulty level, scoring consistency, and ability to differentiate between students.

A pilot test was conducted to ensure the instrument met the standards of a high-quality language test (Djiwandono, 1996). To assess higher-order thinking, the study used test items, questionnaires, and other outcome-based methods (Zhang et al., 2024). Three main data collection methods were used: (1) questionnaires to gather teachers' and students' views on HOTS-based assessments, (2) interviews to support the needs analysis, and (3) instrument testing to collect quantitative data for evaluating validity and reliability.

2.1 Data Analysis

The expert validation data were converted into quantitative values, and an average score was calculated. This score was then classified according to the categories in the following table.

Table 1. Guidelines and Scoring Conversion of Expert Validation Results

Score	Conversion	Interpretation
4.3—5.0	86—100	Highly valid
3.5—4.2	71—85	Valid
2.8—3.4	57—70	Moderately Valid
1.0—2.7	0—56	Low Validity

Data analysis of instrument trials was carried out using the ANATES application to measure item validity using the product-moment correlation formula (Arikunto, 2020).

Table 2: Validity Criteria

Validity	Criteria
Between 0.00 – 0.200	Very Low (VL)
Between 0.200 – 0.400	Low (L)
Between 0.400 – 0.600	Moderate (M)
Between 0.600 – 0.800	High (H)
Between 0.800 – 1.00	Very High (VH)

Data analysis of instrument trials was carried out using the ANATES application to measure reliability using the KR-20 formula.

Table 3. Reliability Criteria

Reliability	Criteria
0.80 – 1.00	Very High
0.60 – 0.79	High
0.40 – 0.59	Moderate
0.20 – 0.39	Low
0.00 – 0.19	Very Low

Data analysis of instrument trials was carried out using the ANATES application to measure question difficulty level with the difficulty index (P).

Table 4. Difficulty Index

Difficulty Index	Criteria
Questions with a p-value of 0.00 to 0.30	Difficult
Questions with a p-value of 0.31 to 0.70	Moderate
Questions with a p-value of 0.71 to 1.00	Easy

Data analysis of instrument trials was carried out using the ANATES application to measure differentiating power with the discrimination index.

Table 5. Distractor Effectiveness

Distractor Index	Criteria
76% - 125%	Excellent
51% - 75% or 126% - 150%	Good
26% - 50% or 151% - 175%	Fair
0% - 25% or 176% - 200%	Poor
More than 200%	Very Poor

In addition, the effectiveness of the distractors was analyzed using the distractor index to evaluate the functioning of the answer options in the items (Arif et al., 2019).

The research subjects involved 225 students of grade VII of SMPN 1 Sekayu who were around 12-13 years old with basic ability to understand text but still developing critical thinking skills. This school was chosen because it has a representative learner population for grade VII in Musi Banyuasin. In addition, the research subjects also included teachers as resource persons and experts who provided validation of the developed instruments. The needs analysis of students and teachers focused on three main aspects, namely deficiencies, needs, and wants. Deficiencies are the weaknesses of the question instruments that have been used so far. The need in question is the ideal question instrument and the desire is the desire of students and teachers for the question instrument to be used. The following is a table of the research to be carried out.

Table 6. Research Implementation Schedule

Number	Steps	Time of Implementation					
		Jan	Feb	Mar	Apr	May	Jun
1	Submission of Research Proposal						
2	Research Proposal Seminar						
3	Research Permit						
4	Problem Identification and Needs Analysis						
5	Instrument Design						
6	Instrument Development						
7	Expert Validation						
8	Instrument Testing						
9	Analysis of Instrument Tryout Results						
10	Writing of the Research Report						

3. FINDINGS AND DISCUSSION

3.1 Findings

3.1.1 Results of Students' Needs Analysis

Learner needs analysis was conducted through three data collection methods: questionnaires, open-ended questions, and interviews. Questionnaires were distributed to 225 seventh-grade students at SMP Negeri 1 Sekayu, consisting of 117 girls and 108 boys.

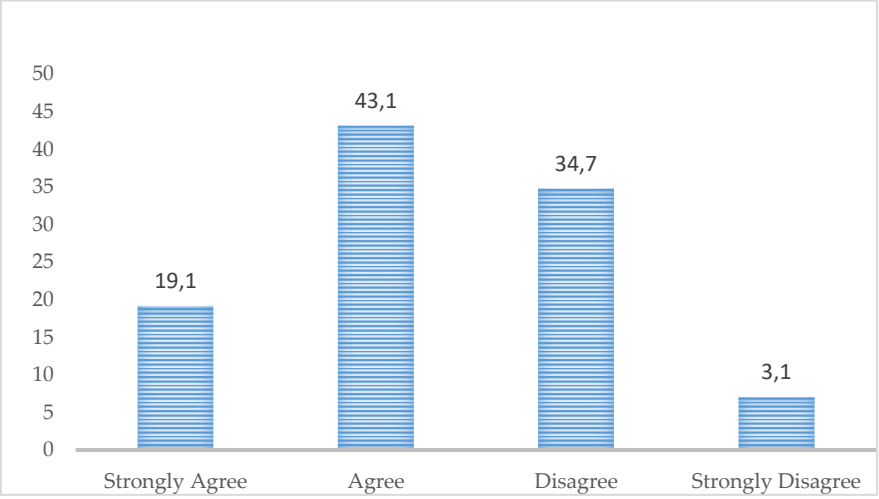


Figure 1. Knowledge of Higher Order Thinking Skills (HOTS)

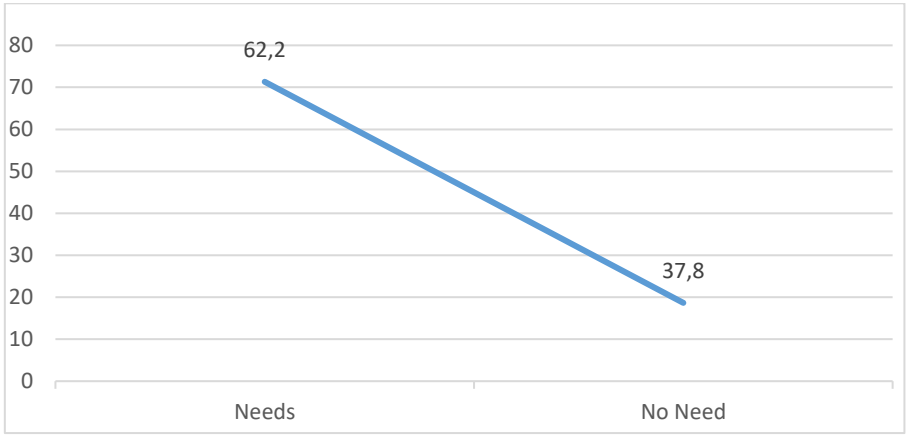


Figure 2. Frequency of knowledge of HOTS questions

The data analysis results show that 19% answered strongly agree, 43.1% answered agree, 34% answered disagree, and 7% answered strongly disagree. This shows that 62.2% of students stated that they knew about Higher Order Thinking Skills (HOTS), as seen in Figure 1. This indicates that most students have a basic understanding of the concept of high-level thinking, so that based on the criteria of need, this question has an interpretation of being needed.

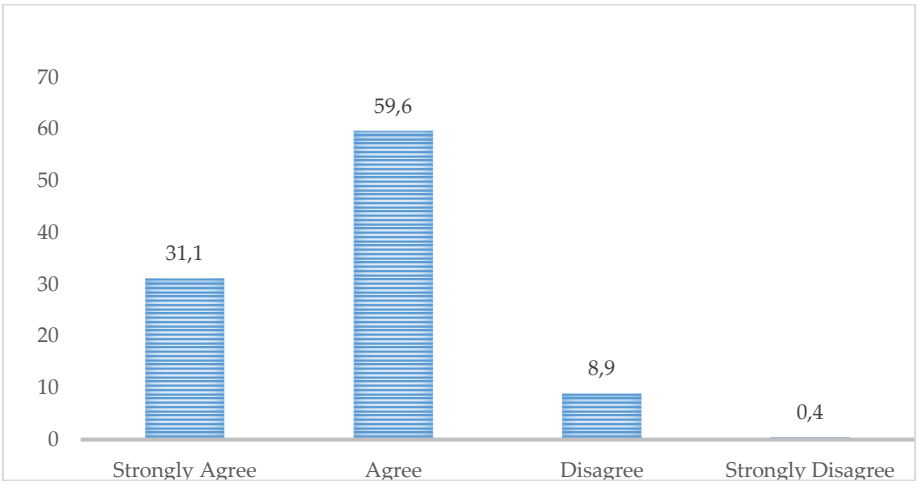


Figure 3. HOTS Instruments Help Students Understand the Lesson More Deeply

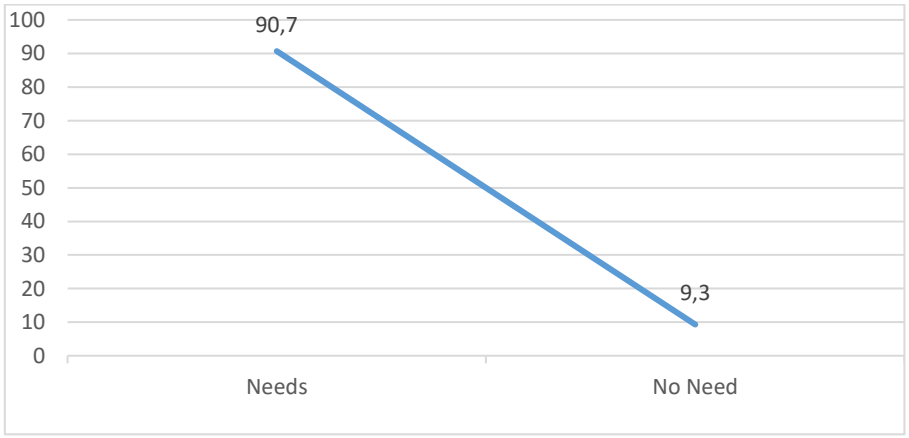


Figure 4. Frequency of HOTS Instruments Helps Students Understand the Lesson More Deeply

The analyzed data showed that 31.1% answered strongly agree, 59.6% answered agree, 8.9% answered disagree and 0.4% answered strongly disagree. This shows that 90.7% of learners stated that the HOTS instrument helped them understand the lesson more deeply. This indicates that the HOTS approach is not only valid but also preferred by learners so that based on the needs criteria, this question has the interpretation of the need for HOTS question instruments to understand lessons more deeply.

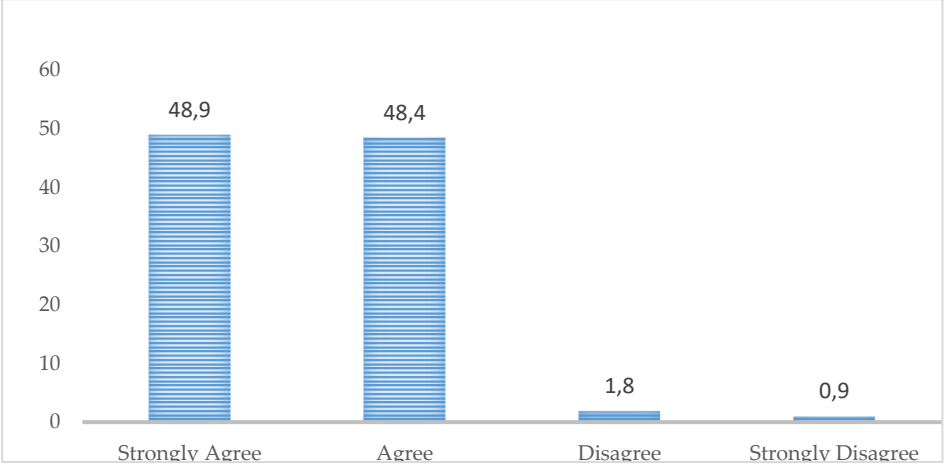


Figure 5. Students' Needs for Evaluation Questions that Demand Higher-Level Thinking Skills

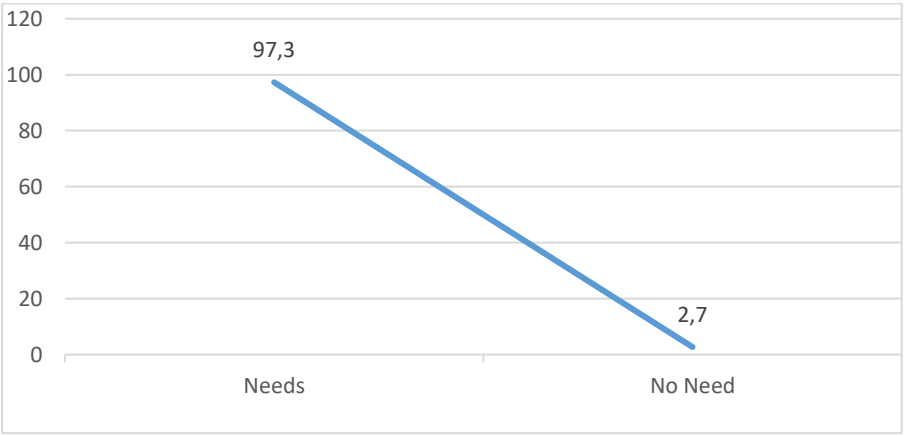


Figure 6. Frequency of Students' Needs for Evaluation Questions that Demand Higher-Level Thinking Skills

The analyzed data showed 48.9% answered strongly agree, 48.4% answered agree, 1.8% answered disagree, and 0.9% answered strongly disagree. This shows that 97.3% of learners stated that they need question instruments that demand higher-order thinking skills. The rejection of the need for HOTS questions is very low, with only 2.7% of learners disagreeing. This shows that there is an internal drive from learners to work on questions that are challenging and involve complex thinking processes. Based on the percentage above, this question has an interpretation of the need for question instruments that demand higher-order thinking skills.

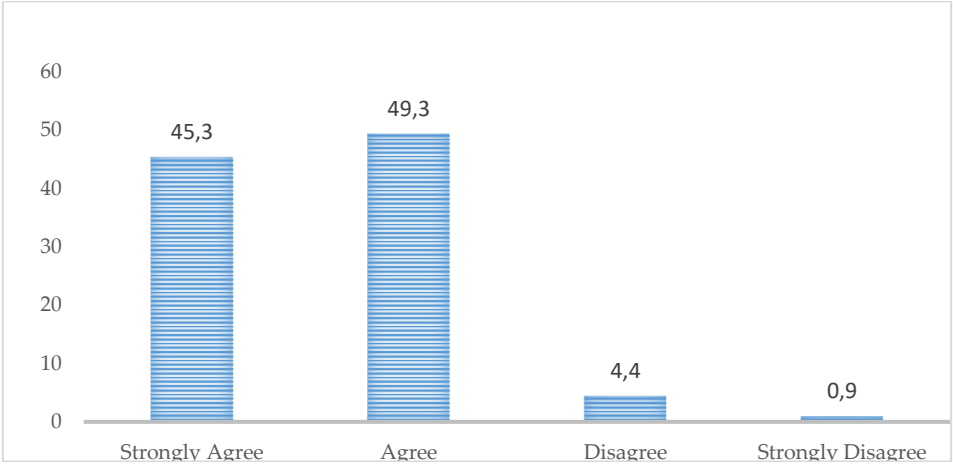


Figure 7. Students' Knowledge of Informational Texts

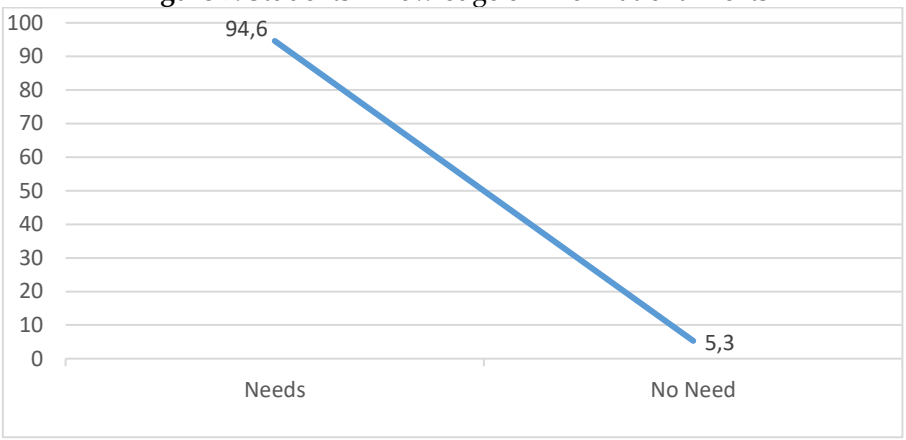


Figure 8. Frequency of Students' Knowledge of Informational Texts

The analyzed data showed 45.3% answered strongly agree, 49.3% answered agree, 4.4% answered disagree, and 0.9% answered strongly disagree. This shows that 94.6% of students stated that students know what informational text is. So that conceptually, students already have a basic concept related to what information text is which will later become the stimulus text in the questions to be developed.

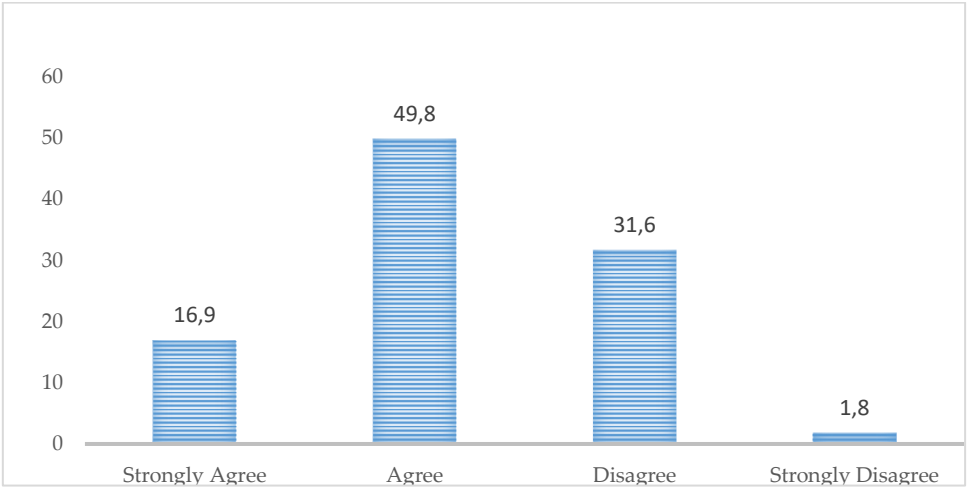


Figure 9. Students' Knowledge of Informational Text Types

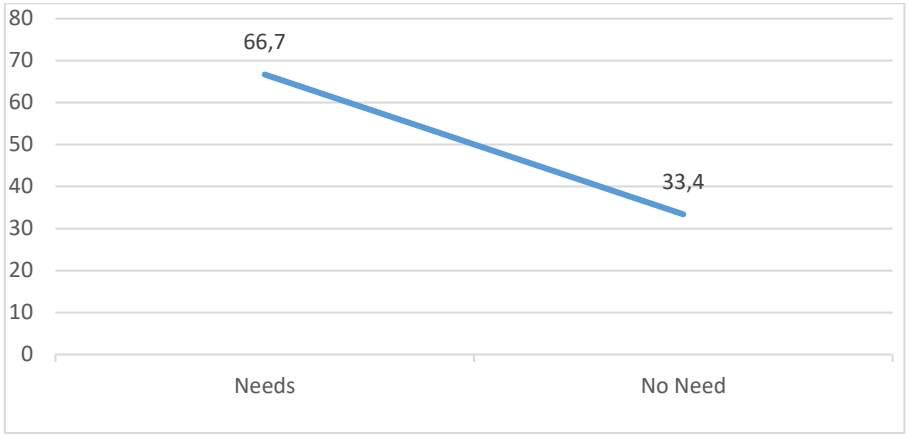


Figure 10. Frequency of Students' Knowledge of Informational Text Types

The analyzed data showed 16.9% answered strongly agree, 49.8% answered agree, 31.6% answered disagree and 1.8% answered strongly disagree. This shows that 66.7% of learners stated that they knew the types of information texts. However, there are 33.4% of learners who do not know clearly the types of informational texts. Thus, according to the researcher, learners need to be introduced to the types of informational texts as a stimulus in the HOTS question instrument to be developed. Based on the percentage above, this statement has an interpretation of the need for question instruments using informational text as a stimulus.

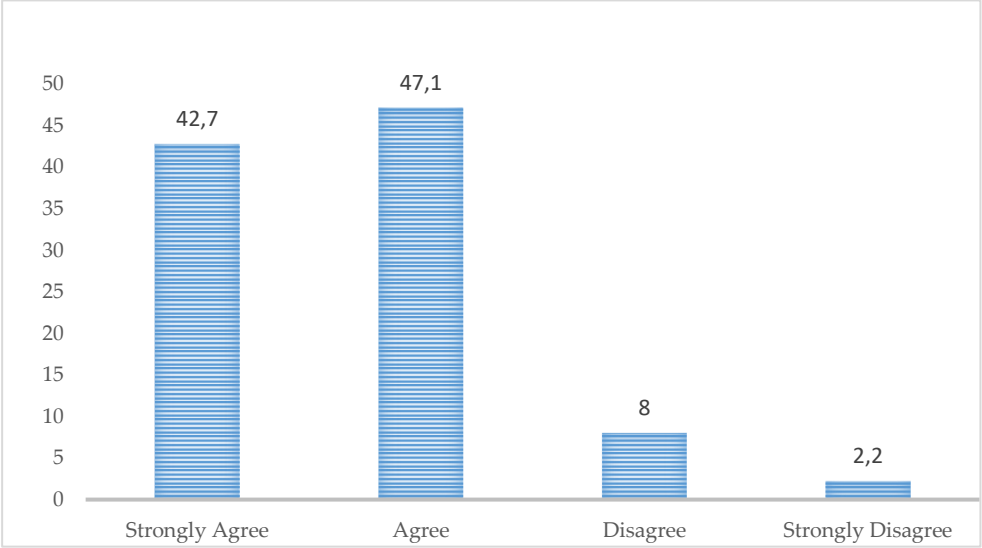


Figure 11. Students' Knowledge of Google Forms

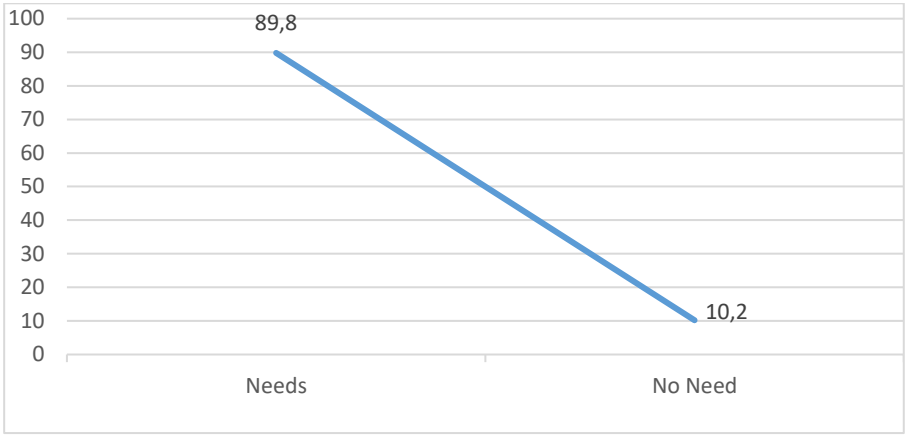


Figure 12. Frequency of Students' Knowledge of Google Forms

The analyzed data showed 42.7% answered strongly agree, 47.1% answered agree, 8% answered disagree and 2.2% answered strongly disagree. This shows that 89.8% of learners stated that they had used Google Form. Thus, according to researchers, students are already familiar with the platform to be used. Based on the percentage above, this statement has an interpretation of the need for question instruments using the Google Form platform.

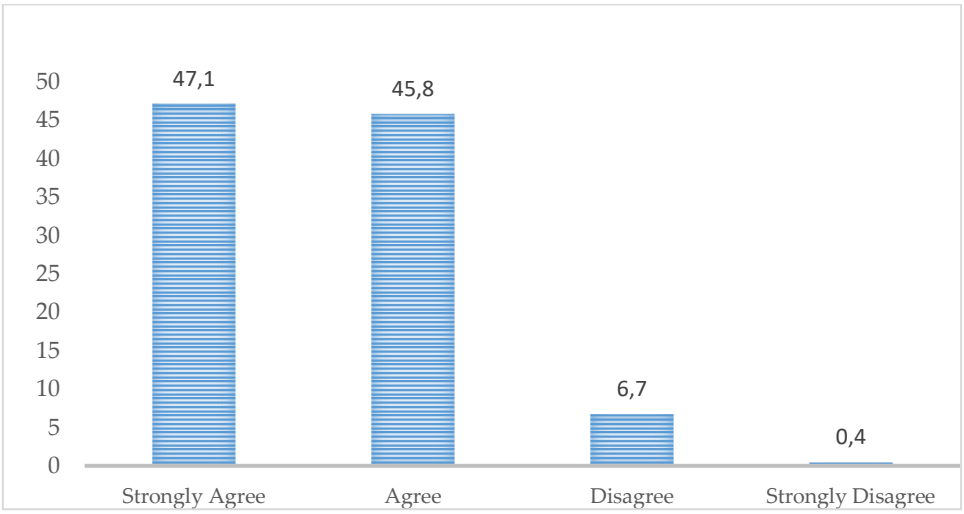


Figure 13. Students' Opinions on Google Form

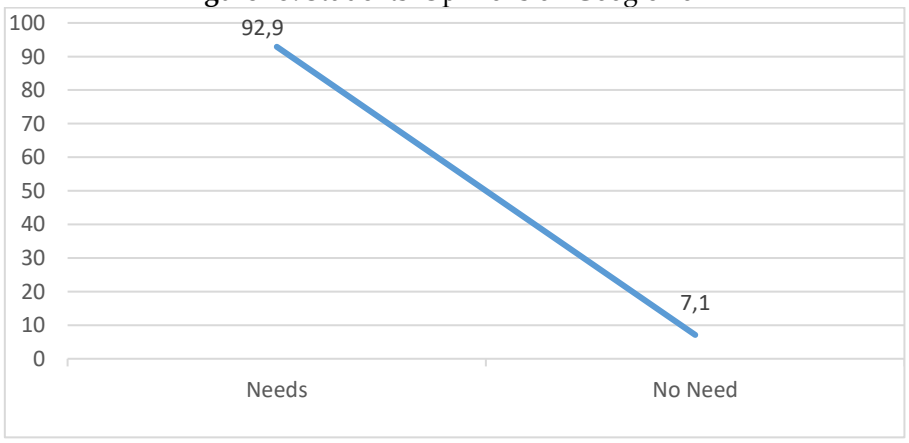


Figure 14. Frequency of Students' Opinions on Google Form

The analyzed data showed 47.1% answered strongly agree, 45.8% answered agree, 6.7% answered disagree and 0.4% answered strongly disagree. This shows that 92.9% of learners stated that those who have used Google Forms agree and strongly agree that Google Forms is easy and flexible to use. Based on the percentage above, the Google Form platform is feasible and appropriate to use as a medium for developing HOTS instruments because students are familiar with its use.

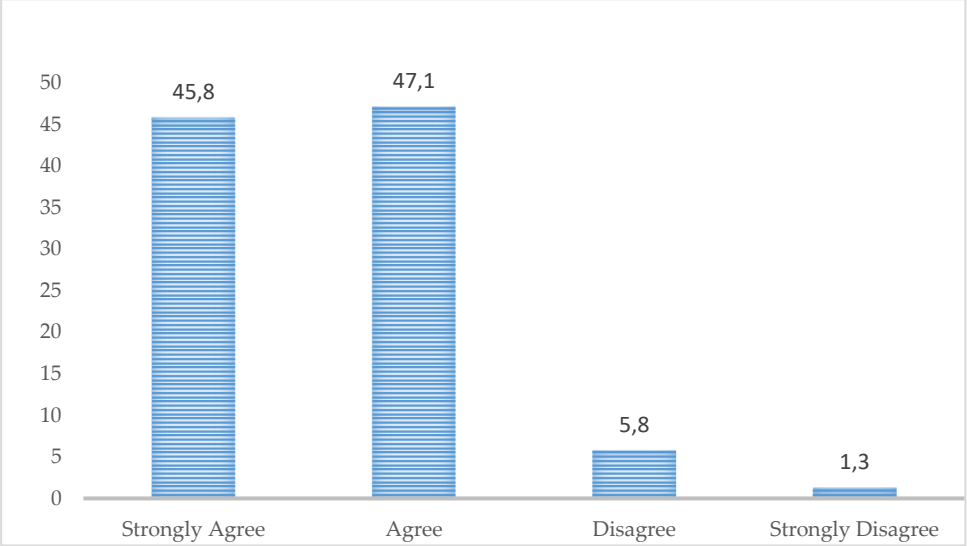


Figure 15. Students' Needs for the Development of HOTS Question Instruments for Informational Text Material

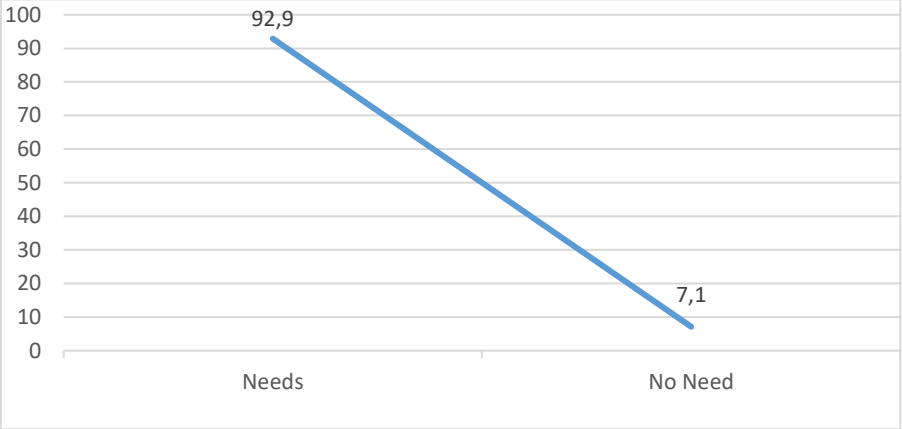


Figure 16. Frequency of Students' Needs for the Development of HOTS Question Instruments for Informational Text Material

The analysis data shows that 45.8% answered strongly agree, 47.1% answered agree, 5.8% answered disagree, and 1.3% answered strongly disagree. In Figure 3.8, the majority of students (92.9%) acknowledged the need for HOTS question instruments for information text material, indicating students' awareness and readiness to practice with questions that require critical, analytical, and evaluative thinking skills. The same percentage (92.9%) also supported the development of Google Form-based HOTS questions, indicating readiness to use technology as part of learning evaluation.

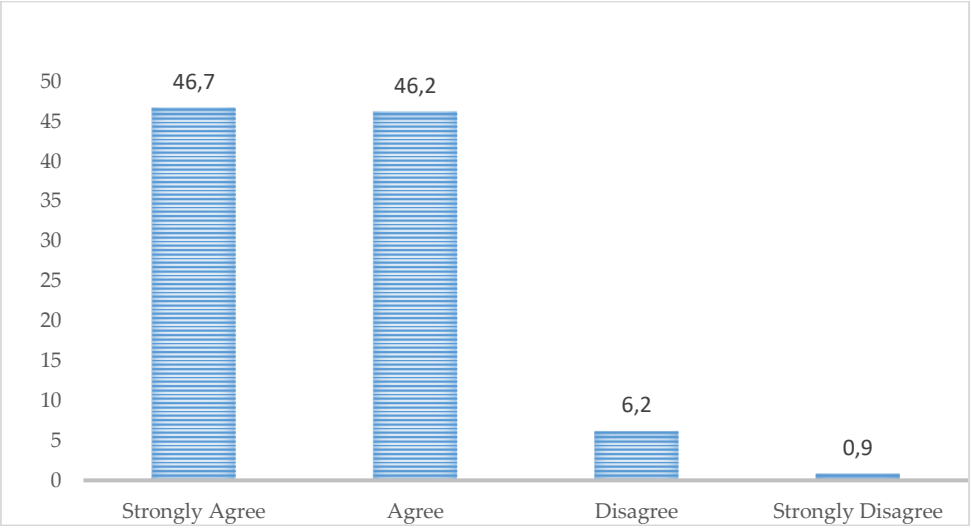


Figure 17. Needs for Problem Development Tailored to Students' Abilities

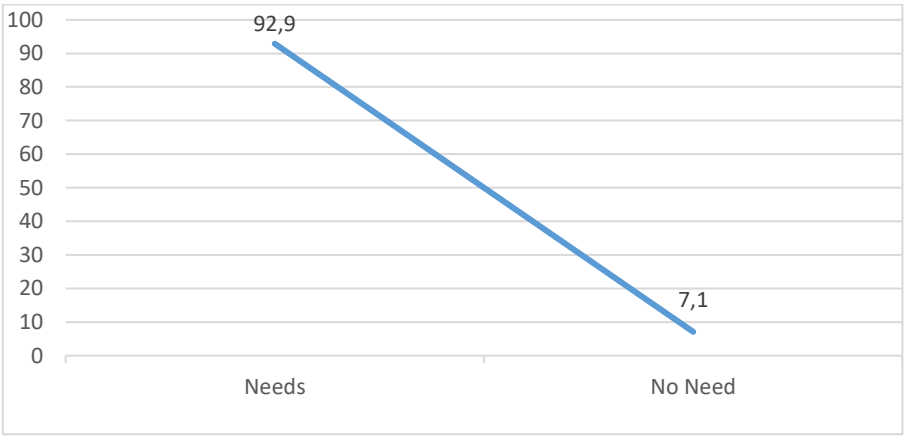


Figure 18. Frequency of Needs for Problem Development Tailored to Students' Abilities

The analysis data showed 46.7% answered strongly agree, 46.2% answered agree, 6.2% answered disagree and 0.9% answered strongly disagree. In Figure 3.8, the majority of students (92.9%) recognized the need for HOTS question instruments for informational text materials to be adapted to the abilities of students. Adaptation of questions to the level of ability is believed to make learning more effective.

Student Needs Analysis Open-ended Questions

Table 7. Needs Analysis Through Open-ended Questions

No	Question	Results
1	Give suggestions or feedback regarding the question instrument you need!	The results of the needs analysis showed several suggestions from students such as clear question instructions, readability of text and questions, the use of contextual text and clear images (if using images), avoiding ambiguous questions, and a balanced variation in the difficulty level of questions.
2	Other than the points above, what do you need in a question instrument?	The results of the needs analysis showed several student needs for the question instrument, namely students wanted questions with text that was not too long and additional images.

3	List the shortcomings of the question instrument that you have worked with.	Based on the results of the needs analysis, the shortcomings of the question instruments that have been done by students include questions that are too easy and too difficult, unclear writing and pictures, questions that are not HOTS, memorization questions, questions and text that are too long, use of language that is too high, unclear question instructions,
4	Other comments to add	The results of the needs analysis showed that additional comments given by students were in accordance with the learning objectives.

The needs analysis through open-ended questions resulted in several important findings summarized in Table 1. Students provided suggestions related to the question instruments needed, including clear question instructions, good readability of text and questions, the use of contextual text and clear images, avoiding ambiguous questions, and a balanced variation in the level of difficulty of the questions. Students also expressed the need for questions with text that is not too long and additional images to facilitate understanding. The shortcomings of question instruments that have been done by students include questions that are too easy or too difficult, unclear writing and images, questions that are not HOTS-based, memorization questions, questions and text that are too long, the use of language that is too high, and unclear question instructions. Additional comments given by students are related to the importance of the suitability of questions with learning objectives.

Analysis of Student Needs Through Interviews

Table 8. Analyzing the Needs of Students Through Interviews

No	Question	Results
1	Do you know or have you heard the term HOTS?	Out of the 20 learners interviewed, only 6 students were familiar with the term HOTS (Higher Order Thinking Skills), while the majority—14 students—were not aware of it. Among those who recognized the term, one student shared, "*I've seen the word HOTS in our school textbook*." Another student mentioned, "*I first learned about HOTS when I was in grade 6*." In contrast, the 14 learners who were unfamiliar with HOTS expressed confusion or lack of exposure. Some said, "*I've never heard of HOTS before*," and others responded with, "*I don't know what HOTS means*." This indicates that while a small portion of students have encountered the concept through formal education materials, a significant number have not been introduced to it, highlighting a gap in awareness and understanding
2	If so, what is your understanding of HOTS?	Students' understanding of HOTS (Higher Order Thinking Skills) remains quite limited. Although some students have encountered the term, their knowledge is superficial. One student stated, "*I've read the word HOTS in books, but I don't really know what it means*." Another shared, "*I've seen HOTS written in our textbook, but the teacher didn't explain it*." These responses reflect that while the term is present in learning materials, students often lack a clear understanding of its purpose and application.
3	Do you think the problems you have been working on are more rote or require deeper thinking?	Students gave varied responses about the types of questions they had encountered. Some described a balanced mix of question types, while others recalled a higher proportion of deep thinking questions. One student shared, "*I think it was 50% memorization and 50% deep thinking questions*." Another stated, "*Most were deep thinking—maybe 60%—and the rest were memorization*." Others reported even more emphasis on deep thinking, such as one who said, "*I remember around 80% were deep thinking questions and only 2 were memorization*." Another added, "*About 70% deep thinking, and 30% memorization, I*

		think." However, several students had difficulty recalling the types of questions, with one simply saying, "*I forgot".*
4	How do you understand the informational text?	Most students (12 out of 20) said they were familiar with informational texts. One student remarked, "*Yes, I know informational text. We learned it in class*". Another said, "*I've read informational texts in textbooks before*". However, some students admitted they were unfamiliar with the term. One stated, "*No, I don't know what informational text is*" and another said, "*I've never heard of that before*." Additionally, 2 students were unsure and could not recall, with one saying, "*I forgot if I've learned about it*".
5	Do you know the types of informational texts?	Some students (9 out of 20) were able to mention types of informational texts, although their answers were limited and did not cover all types. One student said, "*I know some types, like reports and articles*". Another shared, "*Informational texts are like news or explanations, right?*" Meanwhile, 3 learners clearly stated their lack of knowledge. One remarked, "*I don't know any types of informational texts*". The remaining 8 students could not recall their knowledge on the topic, with responses such as, "*I forgot the types*" and "*I think I've learned them before, but I can't remember now*".
6	Have you ever done HOTS questions through the Google Form application?	More than half of the students (12 out of 20) said they had used Google Form before, though not specifically for HOTS-related questions. One student said, "*I've used Google Form, but only for regular quizzes and surveys*." Another added, "*Yes, I've used it during online learning, but not for HOTS questions*". The remaining 8 students reported no prior experience with Google Form. One stated, "*I've never used Google Form before*" while another commented, "*I don't know how to use it*".
7	If so, do you find Google Form flexible and easy to use?	Based on the previous answers, learners who have used Google Form agree that the use of Google Form is flexible and easy to use.
8	Are there any obstacles that you experience when using Google Form to do the questions?	Most students reported no significant difficulties when using Google Form. One student said, "*I didn't have any problems using it; it was easy*" Another added, "*Everything worked fine when I used Google Form*." However, 4 students mentioned experiencing network-related issues. One of them stated, "*Sometimes the internet is slow, so it takes time to load the form*" Another shared, "*I had trouble submitting because of a bad connection*". These responses suggest that while Google Form is generally accessible to students, internet connectivity remains a barrier for some.
9	Do you think you need HOTS questions on informational texts to improve your critical thinking skills?	All students (20 out of 20) expressed a clear need for HOTS (Higher Order Thinking Skills) questions related to informational texts to help improve their critical thinking. One student stated, "*Yes, we need more HOTS questions so we can think deeper, not just memorize*" Another said, "*HOTS questions make us practice analyzing and understanding, not just answering*". This unanimous response reflects strong student support for the inclusion of HOTS-based informational text materials in learning.
10	What are your suggestions and expectations for the development of HOTS question instruments for informational text materials using Google Form so that they can improve critical thinking skills?	During the interviews, students provided several suggestions to improve the HOTS question instrument. Many emphasized the importance of readability. One student suggested, "*Please use shorter texts so they're easier to understand*." Another added, "*The font should be clear and not too small*." Students also commented on the clarity of images and language. One noted, "*The pictures need to be clearer so we can understand the context better*." Another said, "*Use simpler language*

	so we don't get confused." In terms of text composition, a student recommended, "*Try to make the text more interesting and not too long*." These suggestions highlight the need for clear, accessible, and engaging materials to support learners' understanding and critical thinking.

Interviews were conducted with 20 randomly selected seventh grade learners, with the results presented in Table 2. The results of the interviews showed that of the 20 learners interviewed, only 6 learners knew what HOTS was, while the other 14 had not known or heard the term. Learners' understanding of HOTS is also still very limited, because they have only read the word "HOTS" in books without knowing its full meaning. Regarding the types of questions that are usually done, 5 learners stated that there is a balance between memorization questions and deep thinking questions (50:50), 4 learners answered 60% deep thinking questions and 40% memorization questions, 2 learners answered 80% deep thinking questions and 20% memorization questions, 2 learners answered 70% deep thinking questions and 30% memorization questions, while 7 learners answered that they forgot. Regarding the understanding of informational text, 12 learners stated that they knew, 6 learners did not know, and 2 learners forgot. Meanwhile, 9 learners know the types of informational text although their knowledge is incomplete, 3 learners do not know, and 8 learners forget.

In terms of using Google Form, 12 learners have used it although not specifically for HOTS questions, and 8 learners have never used it. Learners who had used Google Form stated that the application was flexible and easy to use, although 4 learners experienced network problems. It is important to note that all learners interviewed (20 people) stated that they needed HOTS questions on informational text material to improve critical thinking skills. Suggestions from students related to the development of HOTS question instruments using Google Form include the readability of text and questions, clarity of images and language used, and the composition of the text used.

3.1.2 Teacher Needs Analysis Results

Teacher needs were analyzed through interviews to three Indonesian language teachers who teach in class VII at SMP Negeri 1 Sekayu.

Table 9. Teacher Needs Analysis through Interview

No	Question	Results
1	Have you ever created HOTS-based questions?	The results of interviews with 3 teachers showed that two teachers had made HOTS questions but 1 teacher, ES, stated "*I still use HOTS questions from the textbooks used at school, so I have never made my own*".
2	Are the questions you have made for students more rote or require deeper thinking?	Teachers reported that they no longer rely heavily on memorization-based questions, though such questions are still occasionally used. One teacher explained, "*We try not to use too many memorization questions anymore.*" Another added, "*Sometimes we still include memorization, but not as the main focus*." A third teacher noted, "*I use memorized questions only when needed, especially for basic understanding*." This feedback reflects a gradual shift toward more analytical and critical thinking-based assessments while acknowledging the continued, limited role of recall-type questions.
3	How do you understand informational text?	All teachers interviewed expressed a clear understanding of informational text. One teacher stated, "*Informational text is something we often use in the classroom, especially in subjects like science and social studies*." Another mentioned, "*I'm very familiar with informational texts—they help students build knowledge through facts*

		and evidence." A third teacher noted, "*These texts are essential for developing students' reading comprehension and critical thinking*."
4	Do you know the types of informational texts?	The interview results revealed that while all teachers were familiar with the concept of informational text, some still showed uncertainty when asked to identify its types. One teacher explained, "*I know what informational text is—it's factual and used to convey information*." However, another admitted, "*I sometimes forget the different types, like whether biography or procedural text counts*." A third teacher said, "*I understand the concept, but I get confused when trying to name all the categories*."
5	Did the questions you made explore students' literacy skills?	Teachers reported that they currently use questions aimed at developing students' reading literacy skills, though not consistently across all questions. One teacher shared, "*I usually include questions that make students think critically about what they read*." Another noted, "*Some of my questions focus on reading comprehension, but not all—sometimes we just check for understanding*." A third teacher admitted, "*I try to go beyond literal questions, but I don't always manage to do it for every text*."
6	Have you ever created HOTS questions using the Google Form application?	All interviewed teachers have used Google Forms and are familiar with it. One teacher said, "*I often use Google Forms for quizzes and assignments*". Another mentioned, "*It's easy to use and helps me track student responses*". A third added, "*I've been using Google Forms regularly in my classes*."
7	If so, do you find Google Forms flexible and easy to use?	All teachers agreed that Google Forms is flexible and easy to use. One teacher said, "*It's very user friendly*." Another noted, "*Google Forms is flexible, i can adjust it to fit any type of assignment*." A third added, "*It makes creating and sharing quizzes much easier*."
8	Are there any obstacles that you experience when using Google Form to work on questions?	Two teachers, ES and NR, stated, "*There are no obstacles in using Google Forms.*" However, teacher SL noted, "*The security isn't good, students can open other platforms, so supervision is needed*."
9	Is the question instrument that you use valid and reliable?	All three teachers acknowledged that their question instruments had not been tested. One said, "*I've never checked the validity or reliability of my questions*." Another admitted, "*We just use the questions as they are, without testing them first*." A third teacher added, "*I haven't done any formal validation of the instruments*."
10	Do you think students need HOTS questions on informational text material to improve critical thinking skills?	All three teachers agreed on the need for HOTS questions. One stated, "*Students need HOTS questions to think more deeply*." Another said, "*Using HOTS on informational texts helps build critical thinking*." A third added, "*These types of questions train students to analyze and evaluate information*."
11	What are your suggestions and expectations for the development of HOTS question instruments for informational text material using Google Form so that they can improve students' critical thinking skills?	Teachers suggested that questions should relate to material students have already learned. One teacher said, "*Questions need to be based on what students have studied*." Another added, "*It's important the questions connect with the lessons they've been taught*."

Interviews with three Indonesian language teachers yielded more in-depth findings, as presented in Table 4. Two teachers had already created HOTS questions, while one teacher still used questions from the textbook. All teachers stated that they no longer use memorized questions too much, although they are still used in a small proportion. All teachers are familiar with the concept of informational texts, although there are still teachers who are confused and forget when asked about the types of

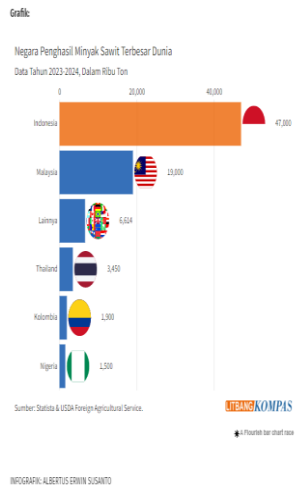
informational texts. They have also used questions that explore students' reading literacy skills, although not all questions use this approach. Regarding the use of Google Form, all teachers have used it and stated that the platform is flexible and easy to use. Two teachers did not experience any problems in using Google Form, while one teacher stated that the security level of Google Form was not good because students could open other platforms so they needed supervision.

Another important finding is that the question instruments used by the three teachers have not been tested for validity and reliability. However, all teachers stated that students need HOTS questions on informational text material to improve critical thinking skills. Suggestions from teachers related to the development of HOTS question instruments include questions that must touch on the material that students have learned. Based on the needs analysis above, it can be concluded that the development of HOTS questions using Google Form is needed by students and teachers at SMP Negeri 1 Sekayu. This development needs to pay attention to various aspects such as the level of difficulty of the questions that are in accordance with the ability of students, the clarity of the question instructions, the readability of the text and questions, the use of contextual text, and the suitability with the objectives. learning. Thus, the instrument of HOTS questions developed is expected to improve students' critical thinking skills optimally.

Sample HOTS Items

Table 10 provides examples of HOTS items and their corresponding cognitive level classifications.

Table 10. Sample HOTS Items

Stimulus	Cognitive Level	Competencies	Competency Descriptions	Items
	Interpret and integrate	Developing inferences, establishing connections, and making predictions based on single and multiple texts	Summarizing and anticipating changes in events, procedures, concepts, or ideas presented in informational texts	Palm oil is one of the commodities widely used in food products, cosmetics, and even as fuel. Countries such as Indonesia and Malaysia are the largest producers of palm oil worldwide. However, to meet the continuously increasing market demand, many tropical forests have been converted into palm oil plantations. If this trend continues without sustainable management, what are the most likely environmental changes that will occur?
	Evaluate and reflect	Assessing the quality and credibility of content in informational texts	Making evaluations grounded in personal reading experiences of texts that gradually become more complex across grade levels	Palm oil is widely used in daily life, ranging from food products and soap to cosmetics. Indonesia is the largest producer in the world. If you live in Indonesia and want to help preserve the environment from the negative impacts of palm oil production, which action would be most appropriate based on your

	understanding of the infographic data above?

Expert Validation Results

The expert validation has resulted in the following data. The first expert validator of the question evaluation scores 56 out of 60, and the second expert validator of the question evaluation scores 76 out of 80. Meanwhile, the third expert validator of the question evaluation scores 67 out of 68. Thus, the average score of the three expert validators in the question evaluation is 66,33. These findings indicate that HOTS assessment questions are very feasible.

The first evaluation validator scores 56 out of 60 with an average of 93%. Meanwhile, the second material validator score of 76 out of 80 with an average score of 95%. Then the third language validator score of 67 out of 68 with an average score of 98%. Thus, the average score of the validators is 95% This finding indicates that the material and language used in HOTS questions developed in this research were very feasible. The expert validation results in the respective fields are presented in Figure 19.

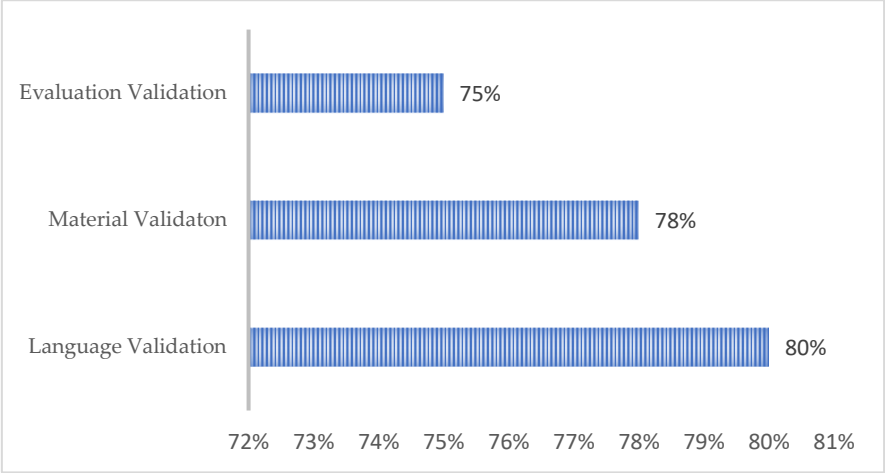


Figure 19. Expert Validation Results

3.1.3 Lacks

Based on the analysis of the questionnaires and interviews conducted, several shortcomings were identified in the question instruments that have been used at SMP Negeri 1 Sekayu. From the perspective of students, the main shortcomings include an imbalance in the level of difficulty of the questions where some questions are too easy or too difficult, the low quality of readability with unclear writing and images, and the dominance of memorization-based questions that have not measured higher-level thinking skills. The percentage of memorized questions is still quite significant, with some students stating that 50% of the questions they work on are still memorized. In addition, question instruments often use texts that are too long with the use of language that is too high for the cognitive level of seventh-grade students, as well as unclear question instructions. From the teachers' point of view, the fundamental shortcomings lie in the use of text that is not contextualized, the majority of questions are still based on Lower Order Thinking Skills (LOTS), and the level of difficulty is not in accordance with the cognitive development of students. Most crucially, the interview results revealed that the question instruments used by the three teachers had not been tested for validity and reliability, so their reliability and accuracy in measuring students' abilities could not be ascertained.

3.1.4 Needs

The needs analysis showed the urgency of developing HOTS question instruments tailored to the characteristics of seventh grade students. The data shows that 97.3% of students and 100% of teachers stated that they need evaluation questions that require higher-order thinking skills. This need is based

on the realization that HOTS instruments help learners understand lessons more deeply, as stated by 90.7% of learners and 100% of teachers. Regarding informational text material, 92.9% of learners recognized the need for HOTS question instruments for the material, in line with 100% of teachers who stated that learners need HOTS-based evaluation instruments for informational text material to improve critical thinking skills. In addition, the need to utilize technology in learning evaluation is shown by 92.9% of learners and 100% of teachers who support the development of HOTS questions based on Google Form.

3.1.5 Necessities

From the results of open-ended questions and interviews, several wishes for the development of HOTS question instruments were identified. Learners want clear question instructions, good readability of text and questions, contextual use of text, visual support in the form of clear images, minimization of ambiguous questions, and balanced variation in question difficulty levels. Teachers expect questions that are appropriate to the context, relevant to learning outcomes, and able to explore students' critical thinking skills. Both teachers want the development of HOTS question instruments that are tailored to the abilities of students (97.3% of students and 100% of teachers). Teachers also emphasized the need for supervision when using Google Forms to ensure students do not open other platforms while working on questions, and the importance of questions that touch on material students have learned.

3.2 Discussion

Based on the findings of this study, it can be concluded that there is an urgent and significant need for the development of HOTS-based question instruments that are capable of assessing students' higher-order thinking skills through contextual and meaningful learning evaluation. The results show that teachers and students at SMP Negeri 1 Sekayu recognize the lack of quality in the evaluation instruments currently used, which are still dominated by lower-order thinking questions (LOTS), have language that is too complex, and lack standardized procedures for validity and reliability testing (Ernalida et al., 2022; Nurhayati et al., 2023).

The research instrument developed in this study, which focuses on informational texts and utilizes the Google Form platform, effectively addresses both local and academic gaps. Locally, it provides teachers with a practical and accessible tool to assess students' analytical, evaluative, and creative thinking; academically, it aligns with current literature that views HOTS as essential for 21st-century competencies (Atef et al., 2025; Nguyen et al., 2025).

The overwhelmingly positive response—97.3% of students and 100% of teachers supported HOTS-oriented assessments, while 92.9% of learners appreciated the digital practicality of Google Forms—demonstrates the readiness of both parties for a paradigm shift toward higher-order learning (Safitri et al., 2024; Kaloeti & Immanuel, 2024). Moreover, this study highlights the importance of embedding contextual stimuli in assessment items that reflect real-world, socio-cultural, and scientific themes to ensure relevance and authenticity in student responses (Nufus, 2020; Zhou et al., 2023).

For educators and curriculum designers, this research recommends integrating HOTS development into daily lesson planning, systematically validating digital tools, and conducting regular capacity-building programs to reinforce teachers' skills in designing and implementing critical-thinking assessments. As supported by previous studies (Puspitasari et al., 2021; Nurhayati et al., 2023), when teachers are trained and equipped with the right strategies and resources, they can better support the development of students' critical literacy.

Future research should consider expanding the scope of this instrument to other grade levels or regions, exploring its adaptability through personalized learning platforms, and assessing the long-term effects of HOTS-based assessments on student achievement. In sum, this study contributes not only to improving the quality of local educational assessment but also to advancing national and global priorities for critical thinking development in digital learning contexts.

4. CONCLUSION

This study concludes that developing informational text-based HOTS (Higher Order Thinking Skills) question instruments using Google Forms is both necessary and feasible for Indonesian language learning in seventh grade. The instrument aligns well with students' learning needs, as indicated by 97.3% of students and 100% of teachers who expressed the need for critical thinking-based questions. It also meets validity, reliability, and cognitive development standards. Google Forms proved to be an effective and user-friendly evaluation tool, supported by 92.9% of students and all teachers. The instrument not only addresses technical assessment aspects but also incorporates real-life contexts, learning objectives, and varying levels of question difficulty. A key contribution of this research is providing a tested, reliable model for digital assessment in the context of HOTS development. However, a limitation of the study is its focus on a single grade level and one digital platform, which may limit broader applicability. Future research should explore the development of similar instruments across different educational levels, utilize diverse digital platforms beyond Google Forms, and involve larger, more varied populations to enhance generalizability.

REFERENCES

Al-yahyaie, R., Muhamad, M. M., & Binti, F. (2025). Enhancing EFL learners ' reading comprehension: Developing a HOTS-M module for Grade 10 (Oman). *International Journal of Academic Research in Business and Social Sciences, 15*(4). https://doi.org/10.6007/IJARBSS/v15-i4/25028

Areski, S. A., & Pratiwi, W. (2024). The development of ESP media through interactive HOTS E-book based on local wisdom in West Sulawesi. *Journal Emerging Technologies in Education, 2*(5), 395– 406. https://doi.org/10.70177/jete.v2i5.1403

Arif, D. S. F., Zaenuri, & Cahyono, A. N. (2019). Analisis kemampuan berpikir kritis matematis pada model problem based learning (PBL) berbantu media pembelajaran interaktif dan Google Classroom. *Prosiding Seminar Nasional Pascasarjana UNNES*, *2018*, 323–328. https://proceeding.unnes.ac.id/snpasca/article/view/594

Arikunto, S. (2020). *Prosedur Penelitian: Suatu Pendekatan Praktik.* Rineka Cipta.

Arthi, M. P., & Gandhimathi, S. N. S. (2025). Research trends and network approach of critical thinking skills in English Language Teaching – A bibliometric analysis implementing R studio. *Heliyon*, *11*(2), e42080. https://doi.org/10.1016/j.heliyon.2025.e42080

Atef, N., Mansour, Y., & Sabry, H. (2025). Impact of lecture hall's background noise on undergraduates' higher order thinking skills: A field study. *Ain Shams Engineering Journal*, *16*(1), 103238. https://doi.org/10.1016/j.asej.2024.103238

Ernalida, E., Nurhayati, N., Izzah, I., Nadapdap, R., Sucini, E. (2022). Requirement assesment for digital reading literacy minimum competency on assesment question. *Curricula:Journal of Teaching and Learning*, 165–177. https://doi.org/10.22216/jcc.2022.v7i3.1696

Hujjatusnaini, N., Corebima, A. D., Prawiro, S. R., & Gofur, A. (2022). The effect of blended project-based learning integrated with 21st-century skills on pre-service biology teachers' higher-order thinking skills. *Jurnal Pendidikan IPA Indonesia*, *11*(1), 104–118. https://doi.org/10.15294/jpii.v11i1.27148

Kaloeti, A. K. (2024). The impact of Google Form practice test on improving non-English students' tenses. *Journal of English Education and Applied Linguistics*, *13*(3), 769–787. https://doi.org/10.24127/pj.v13i3.9690 https://doi.org/10.24127/pj.v13i3.9690

Liu, J., Liu, Z., Wang, C., Xu, Y., Chen, J., & Cheng, Y. (2024). K-12 students' higher-order thinking skills: Conceptualization, components, and evaluation indicators. *Thinking Skills and Creativity*, *52*(May), 101551. https://doi.org/10.1016/j.tsc.2024.101551

Mirandah, S., Zulkardi., & Putri, R. I. I. (2025). Development of PISA-type questions and activities using election context to determine students' mathematical reasoning. *Jurnal Elemen*, *11*(1), 206-224. https://doi.org/10.29408/jel.v11i1.28013

Munk, S., Ziernwald, L., Heine, J.-H., & Holzberger, D. (2024). How generalizable is the relationship between feedback and reading literacy across different competence levels, multilingual learners, and countries? *International Journal of Educational Research Open, 7*, 100382. https://doi.org/10.1016/j.ijedro.2024.100382

Nguyen, T. V., Chuang, Y. H., Huynh, N. T. T., Stamler, L. L., & LaFramboise, L. (2025). Reliability and validity testing of the Vietnamese version of the critical thinking self-assessment scale. *Teaching and Learning in Nursing*, *000*, 1–7. https://doi.org/10.1016/j.teln.2025.02.037

Nufus, H. (2020). Analisis tingkat kemampuan berpikir kritis siswa dalam memecahkan masalah geometri. *Kaos GL Dergisi*, *8*(75), 147–154.

Nurhayati, N., Ratnawati, L., Ernalida, E., Sholikhah, H. A., & Sariasih, Y. (2022). *Teori, desain, dan soal-soal asesmen kompetensi minimum*. Noer Fikri Offset.

Nurhayati, N., Ernalida, E., Nurulanningsih, N., Izzah, I., Sariasih, Y., & Solikhah, H. A. (2023). Persepsi guru sumatera selatan terhadap asesmen kompetensi minimal dalam upaya meningkatkan berpikir kritis siswa. *Fon: Jurnal Pendidikan Bahasa Dan Sastra Indonesia*, *19*(1), 149–157. https://doi.org/10.25134/fon.v19i1.6870

Nurhayati, N., Ernalida, E., Syarifuddin, S., Sholikhah, H. A., & Firanata, A. (2023). Development of reading literacy assessment questions: An effort to improve students' critical thinking. *Journal of Higher Education Theory and Practice*, *23*(2), 100–116. https://doi.org/10.33423/jhetp.v23i2.5810

Nurhayati, N., Sholikhah, H. A., Sucini, E., Nuzula, K., & Wira, N. E. (2024). Training and mentoring in the development of reading literacy assessment questions for junior high school teachers in Ogan Komering Ilir. *Dinamisia: Jurnal*, *8*(2), 485–496. https://doi.org/10.31849/dinamisia.v8i2.17192

OECD. (2022). *PISA 2022 Assessment and Analytical Framework.* OECD Publishing.

Pinto, M., & Segura, A. (2025). Toward a conceptual framework on mobile information literacy in higher education. *Journal of Academic Librarianship*, *51*(3), 103051. https://doi.org/10.1016/j.acalib.2025.103051

Pratiwi, R. P., Purnomo, M. E., Alwi, Z., & Zulkardi, Z. (2023). The development of inquiry method based explanatory text with pisa framework for junior high school. *English Review: Journal of English Education*, *11*(1), 193–202. https://doi.org/10.25134/erjee.v11i1.7263

Purnomo, M., Nurhayati, N., Saripudin, A., & Sari, A. (2020). Pengembangan penilaian autentik dalam pembelajaran sastra: Pendampingan bagi Guru Bahasa Indonesia SMP, SMA, dan SMK di Kota Pagaralam. *Jurnal Pengabdian Pada Masyarakat*, *5*(3), 681-694. https://doi.org/10.30653/002.202053.365.

Puspitasari, L., Alwi, Z., Suhardi, S., & Zulkardi, Z. (2021). Literacy questions based on hots using context Covid-19. *Journal of Education Research and Evaluation*, 5(4), 624. https://doi.org/10.23887/jere.v5i4.33870

Safitri, F., Shalihah, S., Uyuni, Y. R., Universiti, K., Ugama, P., & Begawan, S. (n.d.). Use of Google Form as an Arabic language learning evaluation tool. *Jurnal Pendidikan Bahasa Arab dan Kebahasaaraban.* https://dx.doi.org/10.18592/jams.v4i1

Sara, S., Suhendar, S., & Pauzi, R. Y. (2020). Profil higher order thinking skills (HOTS) siswa sekolah menengah pertama (SMP) kelas VIII pada materi sistem pernapasan. *Bioedusiana: Jurnal Pendidikan Biologi*, *5*(1), 42. https://doi.org/10.34289/bioed.v5i1.1654

Sari, N., Utami, H. S., & Kuswanto, R. T. (2024). Monitoring evaluation of the learning process. *Jurnal Pendidikan dan Studi Keislaman*, *3*(3), 549–557.

Sugiyono. (2020). *Metodologi penelitian kuantitatif, kualitatif dan R & D*. Alfabeta.

Svedholm-Häkkinen, A. M., Forzani, E., Coiro, J., & Kiili, C. (2025). Online credibility evaluation skills in upper secondary students: The role of grade level, argument evaluation, and analytic thinking dispositions. *Learning and Individual Differences*, *118*(August 2024). https://doi.org/10.1016/j.lindif.2025.102640

Vaszkun, B., & Mihalkov Szakács, K. (2025). Looking for student success factors outside of the educators' scope: The effect of digital literacy, personal skills, and learning habits and conditions

on self-evaluated online learning effectiveness in management education. *International Journal of Management Education*, *23*(2). https://doi.org/10.1016/j.ijme.2025.101188

Xiao, X., Li, Y., He, X., Fang, J., Yan, Z., & Xie, C. (2025). An assessment framework of higher-order thinking skills based on fine-tuned large language models. *Expert Systems with Applications*, *272*(March 2024), 126531. https://doi.org/10.1016/j.eswa.2025.126531

Zhang, M., Gou, J., Zhang, F., & Zhang, X. (2024). Assessment of Higher-order Thinking Skills in Conversation Situation. *Procedia Computer Science*, *242*, 845–852. https://doi.org/10.1016/j.procs.2024.08.210

Zhang, Y., Kaya, D. I., & van Wesemael, P. (2024). An assessment framework for digital participatory practices engaging youth in cultural heritage management. *Journal of Cultural Heritage*, *70*, 408–421. https://doi.org/10.1016/j.culher.2024.10.014

Zhou, Y., Gan, L., Chen, J., Wijaya, T. T., & Li, Y. (2023). Development and validation of a higher-order thinking skills assessment scale for pre-service teachers. *Thinking Skills and Creativity*, *48*(November 2022), 101272. https://doi.org/10.1016/j.tsc.2023.101272

Zulkardi, Z., Meryansumayeka, M., Putri, R. I. I., Alwi, Z., Nusantara, D. S., Ambarita, S. M., Maharani, Y., & Puspitasari, L. (2020). How students work with pisa-like mathematical tasks using covid-19 context. *Journal on Mathematics Education*, *11*(3), 405–416. https://doi.org/10.22342/jme.11.3.12915.405-416