

The Assessment Instrument for Higher Order Thinking Skills in Learning Theme 8 (Bumiku) for Sixth Grade of Elementary School

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ABSTRAK

Proses penilaian yang dilakukan oleh guru pada saat ini masih belum sesuai dengan tuntutan pendidikan abad ke-21. Beberapa guru menggunakan instrumen penilaian yang ada di internet tanpa menggunakan instrumen HOTS. Tujuan penelitian ini adalah untuk menciptakan instrumen penilaian higher order thinking skill (HOTS) pada siswa kelas VI sekolah dasar. Pada penelitian ini, pengembangan instrumen penilaian berpedoman pada model pengembangan Borg & Gall. Dalam penelitian ini, metode yang digunakan untuk mengumpulkan data adalah metode tes. Hasil uji validitas isi yang diuji oleh 4 dosen ahli instrumen penilaian HOTS dinyatakan relevan, uji validitas butir soal yang dilakukan di 4 sekolah dinyatakan valid, hasil uji reliabilitas instrumen penilaian HOTS sebesar 0,82 yang berada pada kategori sangat tinggi, rata-rata hasil uji daya beda soal sebesar 0,43 yang berada pada kategori baik, rata-rata hasil uji tingkat kesukaran soal sebesar 0,502 yang berada pada kategori sedang. Berdasarkan analisis tersebut maka dapat dikatakan bahwa instrumen penilaian higher order thinking skill (HOTS) pada pembelajaran Tema 8 (bumiku) di kelas VI sekolah dasar layak digunakan.

ABSTRACT

The assessment process carried out by teachers at this time is still not by the demands of 21st-century education. Some teachers use assessment instruments available on the internet without using the HOTS instrument. This study aimed to create a higher-order thinking skill (HOTS) assessment instrument for grade VI elementary school students. In this study, the development of the assessment instrument was guided by the Borg & Gall development model. In this study, the method used to collect data is the test method. The results of the content validity test tested by four expert lecturers of the HOTS assessment instrument were declared relevant, the item validity test conducted in 4 schools was declared valid, and the results of the reliability test of the HOTS assessment instrument were 0.82, which was in the very high category, the average test results The difference power of the questions is 0.43 which is in the excellent category, the average test results for the level of difficulty of the questions are 0.502 which are in the medium category. Based on this analysis, it can be said that the higher-order thinking skill (HOTS) assessment instrument in learning Theme 8 (Bumiku) in grade VI elementary school is feasible to use.

1. INTRODUCTION

Education is one of the important elements in the development of the quality of human resources of a nation (Fauzy & Nurfauziah, 2021; Morze et al., 2021). Through education, each individual will have the opportunity to become an individual with good qualities from the psychomotor aspect, the affective aspect, and the cognitive aspect (Oktavia et al., 2020; Thoyyibah et al., 2019). In this era of globalization, education is required to produce quality graduates, compete in the era of globalization, and keep up with the rapid development of information technology. These demands can be realized through learning that directs students to have the skills needed in the 21st century (Andrian & Rusman, 2019; Redhana, 2019). The 21st-century skills that students must master are the 4Cs, namely critical thinking and problem-solving (critical thinking and problem-solving), communication (communication), collaboration (collaboration), and creativity and innovation (creativity and innovation) (Astuti et al.,

2019; Widodo & Wardani, 2020). Teachers must design learning outcomes assessments that can develop critical thinking, problem-solving, collaboration, communication, creativity, and student innovation to form students with 4C skills that follow the demands of 21st-century education (Salmia & Yusri, 2021). Assessment of learning outcomes is collecting and processing information to measure student learning outcomes (Chang & Lund, 2018; Wicaksono et al., 2016; D. Zuliani et al., 2017). The teacher's assessment process will impact students because it provides feedback on what has been learned (Granberg et al., 2021; Msosa et al., 2021). An assessment is said to be good if the assessment is objective, integrated, economical, transparent, accountable, and educative (Subagia & Wiratma, 2016).

The assessment process carried out by teachers at this time is still not following the demands of 21st-century education because there is still a lack of teacher knowledge in developing higher-order thinking skills (HOTS) assessment instruments in elementary schools (Astiwi et al., 2020; Fitriani et al., 2018; Hanik et al., 2021). It is also stated that the questions used by teachers always use questions from existing books, and even teachers always use assessment instruments on the internet without using the HOTS instrument, and these obstacles cause students to have difficulty working on questions related to HOTS (Dermawan et al., 2021; Kurniasih et al., 2020). Therefore, the HOTS instrument is still very rarely developed by teachers in primary schools. So that students' higher-order thinking skills are still relatively low, which causes the curriculum demands not to be achieved optimally. The results of observations and interviews conducted with sixth-grade teachers in Gugus III, Kecamatan Gerokgak, show that the assessment instrument used in the evaluation is not based on higher-order thinking skills (HOTS). All of this can be seen in the questions used by the teacher to assess students who have not been able to train students thinking skills in solving problems. It causes a decrease in students' ability to solve problems related to everyday life. Teachers also have difficulty making assessment instruments based on higher-order thinking skills (HOTS). Assessments carried out by teachers only use assessment instruments in the form of filled-in tests and multiple-choice tests available in teacher handbooks, collections of tests from previous years, and even just looking for assessment instruments on the internet. So teachers have not provided an assessment instrument that can measure students' thinking skills at the cognitive domain level of analyzing (C4), evaluating (C5), and creating (C6).

Seeing the existing problems, it is necessary to find a solution to solve these problems. The solution that can be given is to develop a higher-order thinking skill (HOTS) assessment instrument for learning Theme 8 (Bumiku) in the sixth grade of elementary school. Higher-order thinking skill (HOTS) is the ability of students to think critically and creatively, argue, and make decisions (Anwar et al., 2020; Sa'adah et al., 2019; Seibert, 2021). The higher-order thinking skill (HOTS) assessment instrument developed consists of questions that are at the cognitive level of C4 (analyzing), C5 (evaluating), and C6 (creating) (Andoko, 2020; Pratiwi et al., 2017; Saraswati & Agustika, 2020). Judging from cognitive development, sixth graders are in the formal operational phase. In the formal operational phase, students can think abstractly, reason logically, and conclude from the available information (Widiyati & Wiwik., 2014). The ability to think like that requires students to have higher-order thinking skills. Therefore, students' thinking skills have entered the cognitive domains of C4 (analyzing), C5 (evaluating), and C6 (creating) according to the development of students in sixth grade (Bujuri, 2018). Based on the description above, it is necessary to conduct a study entitled "Development of Higher Order Thinking Skills (HOTS) Assessment Instruments in Learning Theme 8 (Bumiku) in Sixth Grade Elementary School Gugus III, Kecamatan Gerokgak". The advantage of this research is that the assessment instrument developed is adjusted to the child's cognitive level. So that the assessment instrument developed is appropriate. The measuring instrument of the test is centered on higher-order thinking skills in sixth-grade students in the form of multiple-choice questions totaling 20. This study aimed to create a higher-order thinking skill (HOTS) assessment instrument for sixth-grade elementary school students. It is hoped that this assessment instrument can be used to measure and train higher-order thinking skills in sixth-grade elementary school students.

2. METHOD

The development of the higher-order thinking skill (HOTS) assessment instrument in the study of Theme 8 (Bumiku) in the sixth grade was carried out using a research and development design model. This study will use the research and development model developed by Borg & Gall (Salim & Haidir, 2019). The Borg & Gall development model was simplified into five stages: a preliminary study, development, validation, field test, and product revision (Muji, 2014). The research subjects in this study were 82 sixth graders in Gugus III, Kecamatan Gerokgak, Kabupaten Buleleng, Bali. The object of this study is the quality of the items produced. This study uses data collection methods such as observation, interviews, tests, and questionnaires. Observation and interview methods are used to discover the problems in the field. The

test method was used to collect assessment data from sixth graders. The questionnaire method was used to collect assessment data provided by experts. The data collection instrument used in this study was an assessment instrument in the form of a multiple-choice test. The technique used to analyze the data is qualitative and quantitative analysis. Calculation of content validity uses the CVR formula developed by Lawshe. Four experts carried out the content validity test in this study. The data obtained from the field test results were statistically analyzed using the help of Microsoft Office Excel. The analysis of the items includes an item validity test, reliability test, discriminatory power test, and item difficulty level test.

3. RESULT AND DISCUSSION

Result

What is done in the preliminary stage is to prepare the development research that will be carried out. At this stage, the researcher surveys schools and prepares references following the assessment instrument to be developed. The survey implementation in this study took place in Gugus III, Kecamatan Gerokgak. The methods used to obtain information on the field survey activities are the interview method and the observation method. From interviews conducted with sixth-grade homeroom teachers in Gugus III, Kecamatan Gerokgak, information was obtained that sixth-grade homeroom teachers in Gugus III had not used an assessment instrument based on higher-order thinking skills (HOTS). It is due to the low understanding of teachers regarding the development of the higher-order thinking skill (HOTS) assessment instrument. In addition to conducting interviews, observation activities were carried out by observing the instruments developed in schools, especially in the sixth grade. Based on the observations, the assessment instruments developed in schools in Gugus III do not contain elements of higher-order thinking skills (HOTS). The assessment instrument is still at the cognitive levels C1, C2, and C3. So it is necessary to develop a higher-order thinking skill (HOTS) assessment instrument that can train students' higher-order thinking. In addition, references in the form of books and journal articles were also collected to support the implementation of this development research. At this stage, curriculum analysis is also carried out to determine the core and basic competencies of each learning content in sixth grade in Theme 8 (Bumiku).

At the development stage, activities were carried out to develop a higher-order thinking skill (HOTS) assessment instrument. The first step is making a grid of questions to guide the development of an assessment instrument. The grid of questions made must be based on predetermined core competencies and basic competencies. The next step is to develop a higher-order thinking skill (HOTS) assessment instrument following the grid of questions that have been asked previously. In preparing the assessment instrument, the teacher's book and the sixth-grade Theme 8 (Bumiku) student book are also used as a reference and material guide for making assessment instruments. The number of questions made in developing the assessment instrument was 20, covering five learning content, namely Natural Sciences, Social Sciences, Indonesian Language, Citizenship Education, and SBdP. The purpose of developing the higher-order thinking skills (HOTS) assessment instrument is to train students' higher-order thinking skills following the demands of the 2013 curriculum. The assessment instrument grid guides higher-order thinking skills (HOTS) assessment instruments. The HOTS assessment instrument grid is presented in Table 1.

Table 1. Grid of HOTS assessment instruments

Aspects of higher order thinking skills	Sub-aspects of higher-order thinking skills	Indicators of higher-order thinking skills	Learning Indicators							Cognitive level and question number		Number of questions		
			3.1.1 (IPS)	3.1.2 (IPS)	3.7.1 (BI)	3.8.1 (IPA)	3.8.2 (IPA)	3.2.1 (PPKn)	3.2.1 (SBdP)	3.2.2 (SBdP)	C4		C5	
Critical and creative thinking	Critical thinking on a phenomenon	Analyzing a phenomenon, theory, statement, or concept			√	√			√	√	√	1		1
												2, 3, 4		3
			√									5		1
												6		1
												7, 8, 9		3
Problem-solving	Problem-solving of a phenomenon	Assessing a phenomenon, theory, statement, or concept	√	√		√			√		√	10, 11		2
												12, 13		2
							√		√			14, 15		2
												16, 17		2
		Determine the solution to a problem			√		√	√				18, 19, 20		3

The product validation stage is carried out to determine the feasibility of the developed instrument. The validation stage is carried out by submitting validation sheets, instrument grids, and instruments made to 4 expert lecturers from the Faculty of Education, Ganesha University of Education, as validators. The validity test results will be used as a benchmark in revising things that are not in accordance with the developed assessment instrument. If the assessment instrument developed has met the requirements and is feasible to be tested in the field, then the validation stage has been completed. The field test phase is carried out when the assessment instrument has completed the validation test and is declared eligible for use. In this study, field tests were carried out in Gugus III, Kecamatan Gerokgak. The schools sampled in this study were five schools in Gugus III of Kecamatan Gerokgak, namely SD Negeri 1 Patas, SD Negeri 2 Patas, SD Negeri 3 Patas, SD Negeri 4 Patas, and SD Negeri 5 Patas. The field test phase is carried out by testing the assessment instruments developed for sixth-grade students in Gugus III, Kecamatan Gerokgak, to get field test results used in data analysis. From the results of this field test, data analysis will be carried out to determine the items' validity, the questions' reliability, the discriminating power of the questions, and the level of difficulty of the questions that have been developed.

After conducting field tests, the next step is to revise the product. The product revision stage is carried out following the results of the field tests that have been carried out. The product revision stage is carried out to improve and refine the developed product. In developing this assessment instrument, product revisions were carried out regarding writing, adjusting the cognitive level of the questions, the language used in the product, and adjusting the question grid. And some questions did not match the number of questions indicated, so improvements needed to be made to produce a perfect product and suitable to be used to measure the ability of students' higher-order thinking skills (HOTS). Based on the validation provisions of each instrument item in the CVR (content validity ratio) formula, all items of the higher order thinking skill (HOTS) assessment instrument in Theme 8 learning in the sixth grade of elementary school are declared valid. So, according to the provisions, the content validity of the overall higher-order thinking skill (HOTS) assessment instrument in learning Theme 8 in the sixth grade of elementary school is declared valid and feasible to be tested in the field. Following the results of the validity test, all items were declared valid. The average results obtained from the validity test were 0.473 with 1% (0.286). So, according to the criteria ($rpbi >$), the higher order thinking skill (HOTS) assessment instrument in Theme 8 learning in sixth grade that has been developed is declared valid.

From the results of the reliability tests that have been carried out, it can be stated that all items have very high reliability. That is, the higher-order thinking skill (HOTS) assessment instrument in the learning of Theme 8 in the sixth grade of elementary school that has been developed is declared reliable. Based on the different power tests, it was found that 1 question had very good discriminating power, 15 questions had good discriminating power, and four questions had a sufficient discrepancy. As for the results of the power test recapitulation above, it was found that the average power difference was 0.42. From these results, it can be stated that the higher-order thinking skill (HOTS) assessment instrument in learning Theme 8 in the sixth grade of elementary school has a good level of discrimination. Based on the difficulty level test that has been carried out, it is found that two items are in the difficult category, 17 things are in the medium category, and 1 item is in the easy category. As for the results of the recapitulation of the difficulty level above, the average difficulty level of the questions was 0.502. Based on these results, it can be stated that the difficulty level of the higher-order thinking skill (HOTS) assessment instrument in learning Theme 8 in the sixth grade of elementary school has moderate difficulty.

Discussion

In this development research, a product was produced as a higher-order thinking skill (HOTS) assessment instrument in learning Theme 8 (Bumiku) in the sixth grade of elementary school. Data analysis was carried out in the form of a content validity test, item validity test, reliability test, discriminating power of questions, and test of item difficulty level to determine the feasibility of the developed assessment instrument. Based on the content validity test results, all experts stated that the assessment instrument developed was valid in terms of content. The test of the validity of the items obtained the average validity of the items of 0.473 with a significant level of 1%, or all items were declared valid. The reliability coefficient analysis (KR-20) results in the field test have a value of 0.82 with a very high classification. The study of discriminatory power of the questions found that 1 question had very good discriminating power, 15 had good discriminating power, and 4 had sufficient discriminating power. Analysis of the level of difficulty of the questions obtained two items in the difficult category, 17 items in the medium category, and 1 item in the easy category.

Based on the results of the data analysis above, it can be concluded that the higher-order thinking skill (HOTS) assessment instrument in learning Theme 8 (bumiku) in the sixth grade of elementary school is appropriate to be used to measure and train students higher order thinking skills. This statement is

reinforced by research which states that the requirements for a good assessment instrument are valid, reliable, and practical (Afrita & Darussyamsu, 2020; Gaol et al., 2017; Hulukati & Rahmi, 2020; Dewi Zuliani et al., 2017). Furthermore, other research states that a proper assessment instrument based on quantitative analysis is an assessment instrument that has good discriminating power, a good level of problem difficulty, and a high-reliability coefficient value (Arif, 2016; Seibert, 2021; Solihah et al., 2020; Yusup, 2018). The higher-order thinking skill (HOTS) assessment instrument in Theme 8 (Bumiku) learning in the sixth grade of elementary school that was developed is an assessment instrument consisting of cognitive levels C4 (analyzing), C5 (assessing), and C6 (creating) so that it is precise and effective to measure and train students' higher order thinking skills. This is supported by research that states that the higher-order thinking skill (HOTS) assessment instrument is an assessment instrument that can be used to measure and train students' ability to solve problems think critically and creatively, argue, and make decisions (Syudirman & Saputra, 2020; Umami et al., 2021). In line with that, other studies also state that the higher-order thinking skill (HOTS) assessment instrument is an assessment instrument that can be used to measure and train students' higher-order thinking skills (Afrita & Darussyamsu, 2020; Hamidah & Wulandari, 2021).

Based on this, the higher order thinking skill (HOTS) assessment instrument in the learning of Theme 8 in the sixth grade of elementary school Gugus III, Kecamatan Gerokgak was declared suitable for use to measure and train students' higher order thinking skills in solving problems in everyday life. The higher-order thinking skill (HOTS) assessment instrument developed is believed to be used to measure three levels of students' higher-order thinking skills, namely C4 (analyze), C5 (evaluate), and C6 (create). Therefore, the higher-order thinking skill (HOTS) assessment instrument is very important to be developed. This study has implications, namely to produce a higher-order thinking skill (HOTS) assessment instrument for learning Theme 8 in the sixth grade of elementary school with a valid validity value, a very high or reliable reliability value, a good discriminatory value, and a moderate level of difficulty. Teachers can use this assessment instrument to measure and train students' higher-order thinking skills (HOTS) in solving problems in everyday life. In addition, developing the higher-order thinking skill (HOTS) assessment instrument can guide teachers in preparing the higher-order thinking skill (HOTS) assessment instrument.

4. CONCLUSION

The result of this study is that the higher-order thinking skill (HOTS) assessment instrument in Theme 8 (Bumiku) learning in the sixth grade of elementary school Gugus III, Kecamatan Gerokgak is suitable to be used to measure and train students' higher-order thinking skills. With the development of this assessment instrument, students can study similar questions to assist students in solving higher-order thinking skills questions

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