



## Analysis of learning objective based on dimensions process cognitive Bloom's

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### ABSTRACT

One of the competencies that a teacher must have is designing learning. Learning design must describe the learning objectives to be achieved. Seeing the various demands today, learning must prepare students to have higher-order thinking and 4Cs skills (Creativity, Critical thinking, Collaboration, and Communication). Based on this situation, this study aims to analyze how teachers as learning designers can determine learning objectives to facilitate students in future challenges. This study was conducted on grade VII mathematics teachers in Bandung City who were included in the first generation of Sekolah Penggerak by classifying learning objectives based on Bloom's cognitive process dimensions. This study uses a qualitative approach with the descriptive, evaluative method. The results of this study indicate that the learning objectives designed by the mathematics teacher class VII at Bandung show that three mathematics teachers had determined learning objectives with the dimensions of process cognitive achievement LOTS. With this study, it is hoped that more teachers will be able to balance the dimensions of cognitive Bloom's as the formulation of learning objectives, especially in the dimensions that equip students to compete in the future.

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### ABSTRAK

Salah satu kompetensi yang harus dimiliki seorang guru adalah merancang pembelajaran. Perancangan pembelajaran harus menggambarkan tujuan pembelajaran yang hendak dicapai. Melihat berbagai tuntutan pada masa kini, tentu pembelajaran harus mempersiapkan peserta didik supaya memiliki keterampilan berpikir tingkat tinggi dan keterampilan 4C (Creativity, Critical thinking, Collaboration, and Communication). Berlandaskan pada keadaan tersebut, maka penelitian ini hendak menganalisis bagaimana guru sebagai perancang pembelajaran mampu menurunkan tujuan pembelajaran agar dapat memfasilitasi peserta didik dalam menghadapi tantangan di masa depan. Penelitian ini dilakukan kepada guru matematika kelas VII di Kota Bandung yang tergabung dalam sekolah penggerak angkatan pertama dengan mengklasifikasi tujuan pembelajaran berdasarkan dimensi proses kognitif Bloom. Penelitian ini menggunakan pendekatan kualitatif dengan metode deskriptif evaluatif. Adapun hasil penelitian ini menunjukkan bahwa tujuan pembelajaran yang dirancang oleh guru matematika mencapai dimensi proses kognitif LOTS. Implikasi penelitian ini diharapkan semakin banyak guru yang mampu mengimbangi terhadap dimensi proses kognitif Bloom sebagai perumusan tujuan pembelajaran, terlebih pada dimensi yang membekali peserta didik agar mampu bersaing di masa depan.

**Kata Kunci:** dimensi proses kognitif; rancangan pembelajaran; taksonomi Bloom

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## INTRODUCTION

The government's National Curriculum policies aim to prepare students for various challenges in the future. The Kurikulum Merdeka explicitly supports the development of Critical Thinking, Communication, Collaborative, and Creativity (4C) skills, which are the core of 21st-century competencies. 4C skills are a means of gaining soft skills that will bring students success in their work (Arnyana, 2019). One of the initial steps to equip students with 21st-century skills is for teachers to formulate learning objectives in accordance with their needs. Formulating learning objectives is expected to maximize learning activities appropriate for each phase of education (Apriyanti, 2023). As an abstract core subject with its challenges, Mathematics presents another challenge for teachers in presenting learning content that is contextual, relevant, multidisciplinary, and flexible, according to the Independent Curriculum (Atteh, 2020; Gusmawan & Herman, 2023).

The results of the analysis of learning objectives in the syllabus of the cognitive assessment course in the school psychology program show that most of the learning objectives in the syllabus discuss the difficulty level of low-level questions as measured using Bloom's taxonomy (Bumpus *et al.*, 2022). Thus, there needs to be further review in aligning learning objectives with appropriate learning content standards supporting cognitive assessment learning in school psychology programs. The cognitive level of mathematics questions based on Bloom's taxonomy, where in the study it was found that in the mathematics enrichment module for grade VII semester 1, especially on the material of straight lines and two-variable linear equation systems published by Putra Nugraha, questions with the cognitive level of Bloom's level of applying (C3), while questions with the cognitive level of analyzing (C4), evaluating (C5), and creating (C6) were omitted (Khairani *et al.*, 2021). It can be used as a reference for improving the next module, providing questions that measure student ability at various cognitive levels.

Based on the research presented, until now, learning has not shown the provision of high-level thinking skills for students. The questions presented in modules and enrichment books are still dominated by low-level cognitive levels or Lower Order Thinking Skills (LOTS). Teachers who have not applied questions based on Higher Order Thinking Skills (HOTS) for learning evaluations have resulted in low student thinking skills (Kumala *et al.*, 2024). This requires efforts to improve the development of learning objectives as an initial step in determining the competency targets to be achieved by students by directing them to high-level thinking skills as an effort to provide meaningful learning experiences. Therefore, this study was conducted to analyze the learning objectives contained in the teaching module and to determine the extent to which high-level thinking skills have been applied to four schools in Bandung as implementing Sekolah Penggerak.

## LITERATURE REVIEW

### Higher Order Thinking Skills (HOTS)

Higher Order Thinking Skills (HOTS) comes from Bloom's taxonomy which emphasizes the ability to analyze, evaluate, and create as a need that students must master as a development of human resources that can face complex challenges (Kardoyo *et al.*, 2020; Magdalena *et al.*, 2020; Mahyudi & Kurniawan, 2022). If learning is integrated with HOTS, students can think critically and encourage problem-solving (Adzidzah & Yudiawan, 2024; Puspitasari & Hidayatullah, 2020).

Many students still have not reached the expected level of understanding in mathematics, especially in high-level skills (Wibowo *et al.*, 2024). The low level of skills is partly due to the learning method that still uses learning method that tends to memorize formulas and procedures without really understanding the basic concepts. So, students will find it difficult if they face a different situation with more complex

questions. Therefore, using methods that memorize formulas and procedures without understanding the basic concepts is less likely to stimulate students to think critically and creatively (Wati *et al.*, 2023).

With various backgrounds presented in various studies regarding students' low level of high-level thinking skills, teachers must be brave in making decisions to provide learning that encourages students to have high-level skills gradually. Teachers, as innovators, can start by formulating learning objectives that lead to high-level skills and then provide effective teaching strategies that support students' development of these skills (Murwantini, 2022; Villejo, 2024).

### Thinking Skills Domain in Bloom's Taxonomy

Referring to Bloom's taxonomy as a basic framework in categorizing cognitive levels in achieving learning objectives, Bloom's taxonomy describes a framework for cognitive development in helping educators design learning objectives and assessments to foster critical thinking skills, problem-solving, and creative skills in students. (Yunida & Arthur (2023).

The initial idea of this thinking skills domain was put forward by Benjamin Bloom in 1956, covering the cognitive aspects of knowledge (C1), understanding (C2), application (C3), analysis (C4), synthesis (C5), and evaluation (C6) (Listiani & Rachmawati, 2022). However, this taxonomy was revised to become the revised Bloom's Taxonomy by Lorin Anderson and David Krathwohl in 2001, covering the cognitive aspects of remembering (C1), understanding (C2), applying (C3), analyzing (C4), evaluating (C5), and creating (C6). The following are the levels of assessment of high-level thinking skills, including analyzing (C4), evaluating (C5), and creating (C6) (Ginting *et al.*, 2021; Lourdusamy *et al.*, 2022).

**Table 1.** Cognitive Ability Indicators in the Revised Bloom's Taxonomy

Cognitive Level	Indicator
Remembering (C1)	Recalling relevant knowledge and long-term memory of the material that has been learned in the form of terms, facts, concepts, procedures, and methods.
Understanding (C2)	Determining the meaning or significance of learning materials, whether oral, written, or pictorial communication.
Applying (C3)	Applying or using procedures in certain situations.
Analyzing (C4)	Breaking down material into components and detecting how the elements relate to each other and the overall structure.
Evaluating (C5)	Making assessment decisions based on criteria and/or standards.
Creating (C6)	Combining various elements to form novelty or create original products.

Source: (Hajaroh, 2022; Wicaksono *et al.*, 2023).

The cognitive aspect is divided into two parts when referring to the revised Bloom's taxonomy, namely low-level thinking skills or Lower Order Thinking Skills (LOTS) are skills that refer to procedural knowledge that can be obtained through routine exercises that are the initial foundation in the learning process before increasing to high-level thinking skills (Marlina & Erita, 2023). Low-level thinking skills include direct thinking processes such as remembering (C1), understanding (C2), and applying (C3) knowledge. Higher Order Thinking Skills (HOTS) require students to manipulate data in unique ways to help understand new meanings and implications, including the ability to analyze, evaluate, and create (Sabir *et al.*, 2021).

### Improving Higher-Order Thinking Skills through Learning Objectives

Formulating learning objectives for some educators may be merely an administrative task, but formulating learning objectives, if done effectively and with an understanding of the importance of developing learning objectives, will have an impact on the success of the teaching itself (Castro-Rodríguez *et al.*, 2022). Learning objectives contain specific statements and clarify the various things students must achieve by combining teaching strategies and assessment methods. In the Kurikulum Merdeka, learning objectives are operational and concrete. The formulation of learning objectives includes competencies and the scope of material. With well-defined learning objectives, it will ensure that educational content meets the standards and needs of students (Liu & Yun, 2024).

Learning objectives play a very important role in improving high-level thinking skills for students, because 1) they provide clarity of direction, where learning objectives that focus on HOTS can help teachers design relevant and challenging learning activities so that students can understand what is expected and can focus on developing analytical, evaluation, and creative skills (Fanny *et al.*, 2024); 2) encourage a deep learning process rather than just memorizing so that learning can be more meaningful because students are involved in problem solving and exploration (Ovartadara *et al.*, 2023); 3) integrate various skills, with relevant learning objectives ensuring that students can develop critical, creative, and integrated thinking skills in a balanced manner; 4) prepare students for the future, learning objectives directed at HOTS help students prepare themselves to face global challenges with confidence; and 5) facilitate learning evaluation, with specific HOTS-based learning objectives allowing educators to design effective assessments and not only measure knowledge, but also analytical, evaluation, and creative skills (Putri *et al.*, 2023).

The components listed in the teaching module show how learning objectives improve high-level thinking skills. Operational Verbs (OVs) used in determining learning objectives describe actions that help students achieve the expected competency objectives clearly and measurably. OVs can help formulate clear learning objectives for learning assessment (Newton *et al.*, 2020).

## METHODS

This study tries to analyze the learning objectives in the mathematics teaching module for grade VII in Bandung City based on Bloom's cognitive dimensions, so the research approach used is a qualitative approach presented in the form of sentences with natural conditions, with a descriptive evaluative method. The population in this study were grade VII (seven) mathematics teachers at junior high schools implementing the Bandung City Mover School, the first batch, which refers to the Decree of the Director General of Early Childhood Education, Elementary Education, and Secondary Education concerning the Determination of Educational Units Implementing the Mover School Program has been determined since April 2021. Based on the decree, nine schools are the first batch of mover schools in Bandung City. So that at least in the 2022 academic year, the educational units that have been determined have implemented the Merdeka Curriculum. The nine schools included in the first batch in Bandung City include SMP Salman Al Farisi, SMP Hikmah Teladan, SMP Negeri 2 Bandung, SMP Negeri 19 Bandung, SMP Negeri 12 Bandung, SMP Negeri 38 Bandung, SMP Negeri 54 Bandung, SMP Negeri 7 Bandung, and SMP Bintang Madani.

From this population, it was narrowed down again through several considerations, including 1) SMP Negeri 2 Bandung, SMP Negeri 12 Bandung, and SMP Bintang Madani did not confirm regarding research permits; 2) of the six remaining schools, this study focused on teaching modules with the most material sent by the informants so that the learning objectives review process was more structured. In this case, four schools sent teaching modules on integer material, so two schools that sent other materials were not included. From the screening, the final results of this research population consisted of four schools, namely

SMP Negeri 7 Bandung, SMP Negeri 38 Bandung, SMP Negeri 54 Bandung, and SMP Negeri 19 Bandung, which also became research samples.

The data collection techniques used in this study were interviews as primary data collection techniques and document studies as secondary data collection techniques. Data collection using interview techniques was intended to explore information about the process carried out by teachers when determining learning objectives in the form of open-ended questions to obtain additional information (Monday, 2020). Then, the documentation technique is used to produce contextual information regarding the learning objectives formulated in the teaching module, which is adjusted to the existing conditions in the Lembar Kerja Peserta Didik (LKPD). In English, namely, the Student Worksheet with integer material.

The instruments used in this study were non-tests, namely interviews to find out how teachers determine learning objectives, references used as a process for determining learning objectives, and considerations made by teachers in determining learning objectives. This study uses a data analysis model according to Miles in the book "Qualitative Data Analysis", where the first step is data reduction by focusing the teaching module on integer material. Second, data presentation will be done in a table to determine the differences in learning objectives identified by the informants. Third, conclusions are drawn, and verification is done by analyzing the relationships in the data presented.

## RESULTS AND DISCUSSION

### Results of the Study of Learning Objectives at SMP Negeri 7 Bandung



Identitas dan Informasi Modul	
Kode Modul Ajar	
Kode ATP Acuan	
Nama Penyusun/Institusi	MGMP Matematika SMPN 7 Bandung
Jenjang Sekolah	SMP
Fase/Kelas	D/7
Elemen/Topik	Bilangan/Bilangan Bulat
Kata Kunci	Bilangan Bulat, Bilangan bulat positif, bilangan bulat negatif, penjumlahan, pengurangan
Profil pelajar Pancasila	<ul style="list-style-type: none"><li>- Gotong royong</li><li>- Bernalar kritis</li></ul>
Tujuan pembelajaran	Melalui kegiatan pembelajaran ini, siswa diharapkan dapat: <ul style="list-style-type: none"><li>- Membaca, menuliskan, dan membandingkan bilangan bulat, serta menggunakannya untuk menyelesaikan permasalahan dalam konteks keseharian menggunakan operasional hitung (penjumlahan, pengurangan, perkalian, dan pembagian)</li></ul>
Pengetahuan prasyarat	<ul style="list-style-type: none"><li>- Mengetahui bilangan cacah</li><li>- Mengetahui operasi penjumlahan, pengurangan, perkalian, dan pembagian bilangan cacah</li><li>- Mengetahui sifat-sifat operasi pada bilangan cacah</li></ul>
Alokasi waktu (JP)	4 JP (2 Pertemuan)
Metode Pembelajaran	Problem-Based Learning
Sarana/Prasarana	Ruang kelas, hp atau laptop

**Figure 1.** Learning Objectives in Teaching Modules at SMP Negeri 7 Bandung  
*Source: Mathematics Teaching Module Document for SMP Negeri 7 Bandung*

**Figure 1** shows the teaching module designed by the seventh-grade mathematics teacher at SMP Negeri 7 Bandung. From the picture, the Operational Verbs (VOs) "read" and "write" were found, where the VOs "read" and "write" indicate the cognitive domain C1. In addition, the VOs "compare" was also found, which is included in the cognitive domain C2. Based on the VOs used in the learning objectives, it shows that



the learning objectives designed by the seventh-grade mathematics teacher at SMP Negeri 7 are still at a low level of thinking ability.

**TUGAS:** Jawablah tiap persoalan di bawah ini dengan benar dan jelas!

**Soal 1:**

Diketahui sembarang bilangan bulat positif P dan bilangan bulat negatif R. Bilangan P tersusun atas 7 angka sedangkan bilangan R tersusun atas sepuluh angka. Manakah menurut kamu bilangan yang lebih besar? Jelaskan!

**Soal 2:**

Pak Tono dan Pak Toni adalah peternak bebek di desanya. Saat musim panen, pak Tono berhasil memanen 134.723 ekor bebek sedangkan Pak Toni berhasil memanen bebek sebanyak 134.872 ekor. manakah yang berhasil memanen bebek lebih banyak? Jelaskan!

**Soal 3:**

Dalam Ujian Masuk Perguruan Tinggi negeri, setiap jawaban benar diberi nilai 4, salah diberi nilai -1 dan tidak dijawab diberi nilai 0. Dari 40 soal yang diberikan, Wati berhasil menjawab benar 30 soal dan salah 6 soal, sisanya tidak ia jawab. Berapakah Skor total yang diperoleh Wati? Jelaskan

**Figure 2.** Attachment of questions on LKPD at SMP Negeri 7 Bandung  
*Source: Mathematics Teaching Module Document for SMP Negeri 7 Bandung*

The formulated learning objectives follow the presentation of questions in the LKPD. The questions attached to **Figure 2** illustrate the following points: (1) Questions 1 and 2 require students to compare which number is larger or which harvest is greater. In this case, it shows the cognitive domain indicator C2 or LOTS; (2) Question number 3 shows that VOs "determines" the score from the data presented according to its provisions. The questions show the cognitive domain C3 or LOTS. Thus, the teaching module for integer material at SMP Negeri 7 Bandung matches the learning objectives and the LKPD presented.

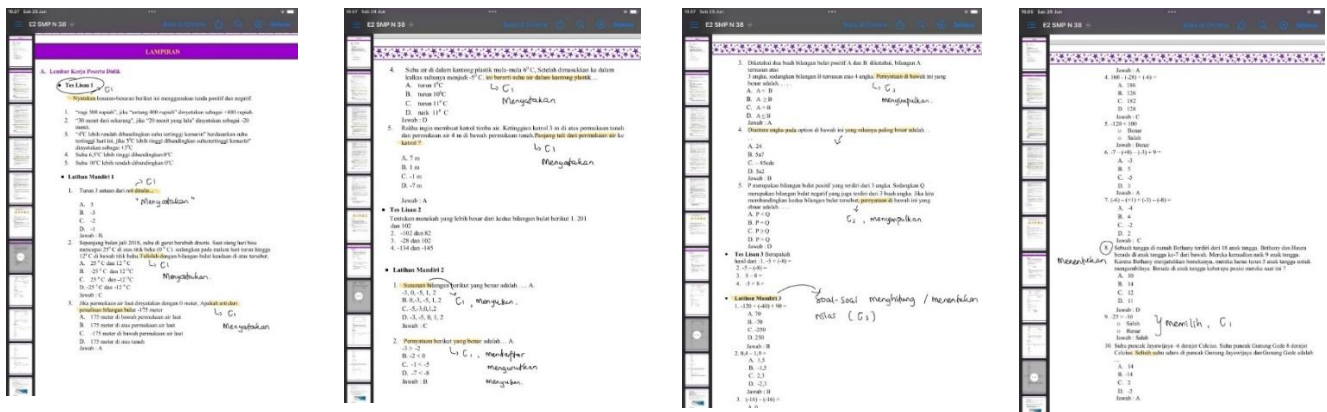
Based on the results of interviews with resource persons at SMP Negeri 7 Bandung, it was found that before determining the learning objectives, the resource persons together with the MGMP subjects at each level discussed in determining the learning objectives, then after that each teacher in each class adjusted to the conditions of the student's competency level. In determining the students' competency, SMP Negeri 7 Bandung conducted cognitive and non-cognitive diagnostic assessments by Guidance and Counseling teachers. Even so, the resource person still carried out cognitive diagnostic assessments independently to find out directly how prepared and initial knowledge the students had before starting learning by providing prerequisite material questions. The resource person said that the lack of HOTS questions given to students was due to different cognitive ability backgrounds. Although the students' cognitive abilities differed, the resource person still tried to ensure that learning could lead to high-level thinking skills, such as providing story problems. However, the resource person also said that students with advanced abilities would be given enrichment in the form of additional HOTS-level questions and become peer tutors in learning for their other friends.

## Results of the Study of Learning Objectives at SMP Negeri 38 Bandung



**Figure 3.** Learning Objectives in the Teaching Module at SMP Negeri 38 Bandung  
Source: Document of Mathematics Teaching Module SMP Negeri 38 Bandung

Second, in the learning objectives listed in the teaching module designed by the Grade VII mathematics teacher at SMP Negeri 38 Bandung, as shown in **Figure 3**, it was found that the learning objectives contain the VOS "to learn," which are included in the cognitive domain C2. In addition, there is also the VOs "presenting," which is included in the cognitive domain C1. Then, the VOs "adding" are included in the cognitive domain C3. The VOs used in formulating learning objectives carried out by the resource person at SMPN 38 Bandung are still at a low level of thinking skills.



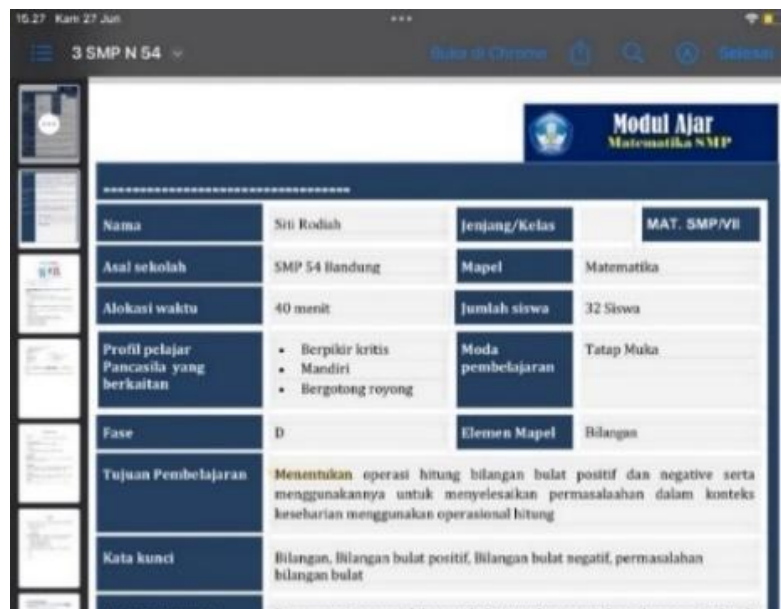
**Figure 4.** Attachment of questions on LKPD at SMP Negeri 38 Bandung  
Source: Document of Mathematics Teaching Module SMP Negeri 38 Bandung

If viewed from the LKPD attached to the teaching module in **Figure 4**, the questions presented are consistent with what is stated in the learning objectives. Here is a more detailed review: 1) In independent practice 1, there are oral test questions from number 1 to number 5. In these questions, the VOs used are "state". This shows its alignment with the learning objectives at the beginning; 2) in independent practice questions 2, there are several types of questions including questions that state the cognitive domain C1 or LOTS obtained in questions number 1 and 2 with the VOs used being "state" or "arrange" or "list" and the like. Meanwhile, questions 3 to 5 are included in the cognitive domain C2 or LOTS, because the

questions state the VOs used are "conclude". The questions in independent practice three are included in the cognitive domain C3 because the command in the question shows the VOs "calculate" or "determine".

Based on the results of interviews conducted with resource persons at SMPN 38 Bandung, it was found that there have been changes in determining learning objectives from the beginning of the implementation of the independent curriculum from year to year. Starting with simply following government directions, until gradually experiencing changes in the results of several activities to improve the competence of educators carried out by the school. The resource person revealed that the reference in determining learning objectives is from Learning Achievements, with the results of discussions of MGMP subjects in schools to assess the material to be given at each class level. Then, to evaluate student competence level, the school conducts cognitive and non-cognitive diagnostic assessments by Guidance and Counseling teachers. However, before the learning process takes place, the resource person also gives a test to students, both verbally and in writing, related to the prerequisite material to be studied. The resource person further explained that HOTS questions are only given to proficient students because only one to three students can solve HOTS questions in one class. The resource person revealed that the zoning system affects the quality of students in schools.

### Results of the Study of Learning Objectives at SMP Negeri 54 Bandung

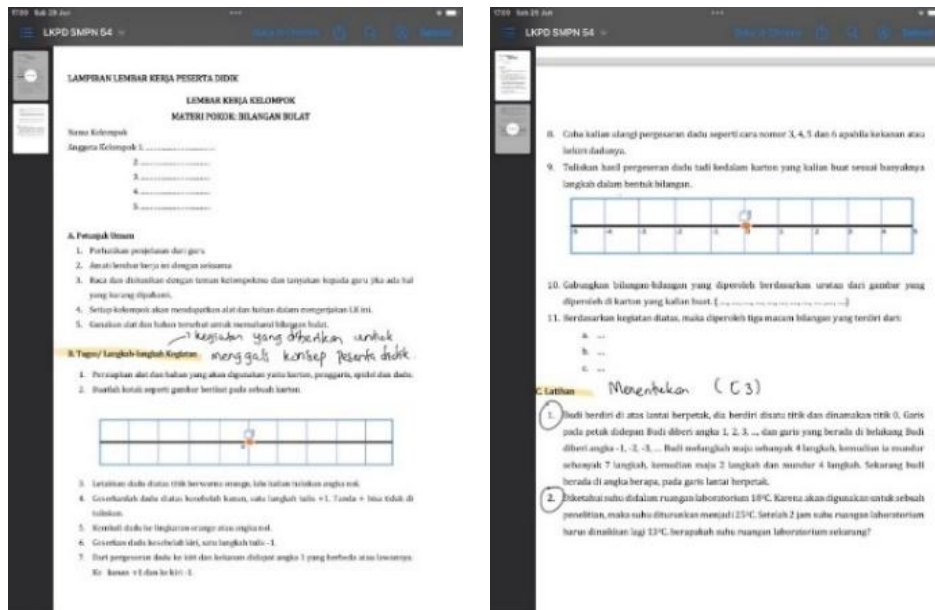


Modul Ajar Matematika SMP			
Nama	Siti Rodiah	Jenjang/Kelas	MAT. SMP/VI
Asal sekolah	SMP 54 Bandung	Mapel	Matematika
Alokasi waktu	40 menit	Jumlah siswa	32 Siswa
Profil pelajar Pancasila yang berkaitan	<ul style="list-style-type: none"><li>Berpikir kritis</li><li>Mandiri</li><li>Bergotong royong</li></ul>	Moda pembelajaran	Tatap Muka
Fase	D	Elemen Mapel	Bilangan
Tujuan Pembelajaran	Menentukan operasi hitung bilangan bulat positif dan negatif serta menggunakannya untuk menyelesaikan permasalahan dalam konteks keseharian menggunakan operasional hitung		
Kata kunci	Bilangan, Bilangan bulat positif, Bilangan bulat negatif, permasalahan bilangan bulat		

**Figure 5.** Learning Objectives in the Teaching Module at SMP Negeri 54 Bandung  
*Source: Document of Mathematics Teaching Module SMP Negeri 54 Bandung*

Third, the learning objectives listed in **Figure 5** in the teaching module at SMP Negeri 54 Bandung state that they contain the VOs "determine," where the VOs "determine" itself are included in the cognitive domain C3 or LOTS.



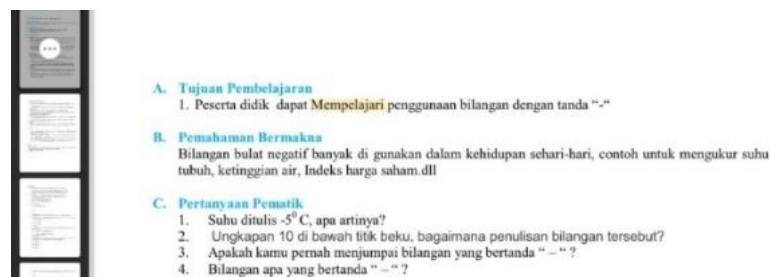


**Figure 6.** Attachment of questions on LKPD at SMP Negeri 54 Bandung  
*Source: Document of Mathematics Teaching Module SMP Negeri 54 Bandung*

In the LKPD attachment in **Figure 6**, the questions show several things: 1) there are questions with activities that provide opportunities to explore students' concepts related to integers; and 2) in the next question, the question is related to the operational verb "to determine" which is included in the LOTS or C3 cognitive domain. This is formulated in the learning objectives: achieving the LOTS cognitive domain.

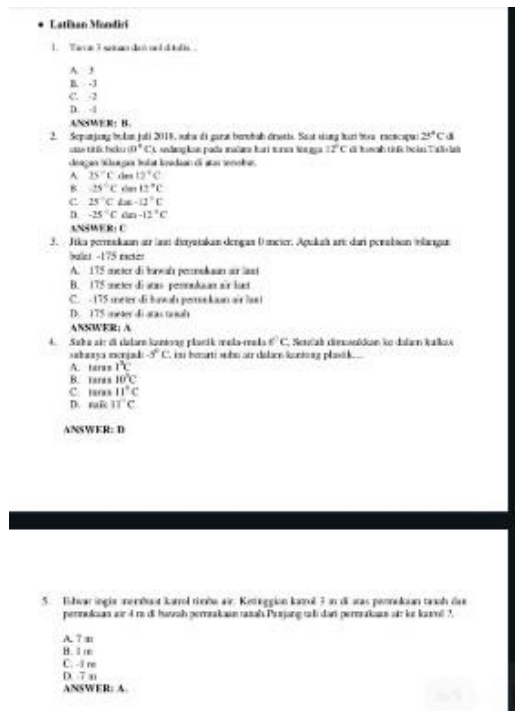
Based on the results of interviews conducted with resource persons at SMPN 54 Bandung, it was found that the determination of learning objectives was based on learning achievements from the government. The determination of these learning objectives has also begun to be developed by considering the characteristics of students. In analyzing student abilities, a test is carried out by asking questions about previous material or prerequisite material and what will be studied. HOTS questions have not been maximized because of students' different abilities. However, the resource person still makes efforts so that students can digest a question that is not only directly using numbers, so the resource person focuses on providing literacy questions. HOTS questions are also not given at every meeting, because they consider students' abilities, so the resource person wants students to feel comfortable first when learning mathematics.

## Results of the Study of Learning Objectives at SMP Negeri 19 Bandung



**Figure 7.** Learning Objectives in the Teaching Module at SMP Negeri 19 Bandung  
*Source: Document of Mathematics Teaching Module SMP Negeri 19 Bandung*

Fourth, the learning objectives designed by the Grade VII mathematics teacher at SMP Negeri 19 Bandung, as shown in **Figure 7**, indicate that the VOs used in the learning objectives are "learning", which is included in the cognitive domain C2 or LOTS.



**Figure 8.** Lampiran soal pada LKPD di SMP Negeri 19 Bandung  
*Sumber: Dokumen Modul Ajar Matematika SMP Negeri 19 Bandung*

The questions attached to the LKPD in **Figure 8** show various story questions concerning using the negative sign "-". Based on the results of interviews with resource persons at SMPN 19 Bandung, the determination of learning objectives is based on existing learning achievements from the government, and also considers students' abilities. Then, the resource person explained that an initial assessment was carried out for student competency knowledge. The initial assessments carried out were cognitive diagnostic assessments and non-cognitive diagnostic assessments. Although the organizer for the diagnostic evaluation is guidance and counseling, subject teachers can also independently carry out diagnostic assessments, primarily cognitive, as the resource person did. Furthermore, the resource person revealed that in implementing the cognitive diagnostic assessment, a test was carried out by giving questions that had been given in elementary school. The implementation also varies from each subject teacher; some use the Platform Merdeka Mengajar (PMM), written, and so on. In addition, the resource person also carries out diagnostic assessments periodically, which are usually carried out every time they start new material. The resource person revealed that proficient children will undoubtedly be facilitated by providing enrichment questions regarding high-level thinking skills. However, students who need assistance will not be forced to work on HOTS questions. Because students' high-level thinking skills are low, HOTS questions are rarely given. Even so, they try by occasionally providing HOTS or literacy questions related to everyday life.

## Discussion

Based on the results of documents and interviews, the learning objectives determined by the resource person as a grade VII mathematics teacher still use Operational Verbs (VOs) for low-level thinking skills. The resource person uses VOs for low-level thinking skills because the cognitive diagnostic assessment

results show that most students' thinking skills in the class cannot accept being given high-level thinking skills. Therefore, the resource person tries to gradually facilitate students' high-level thinking skills by providing questions starting from a low level to a high level, giving story questions so that students can understand and interpret the questions, and making an effort to improve the quality of students' literacy and numeracy. The research results show that the learning objectives formulated by the resource person have not reached the high-level cognitive domain. The following is the use of operational verbs determined by resources in the learning objectives of integer material. **Table 2** below explains using VOs based on the learning objectives set.

**Table 2.** Use of VOs based on established learning objectives

Schools	VOs are used in determining learning objectives	Cognitive levels based on Bloom's taxonomy	
		LOTS	HOTS
SMP Negeri 7 Bandung	Reading, writing, comparing	✓	
SMP Negeri 38 Bandung	Learning, adding, and presenting	✓	
SMP Negeri 54 Bandung	Determining	✓	
SMP Negeri 19 Bandung	Learning	✓	

*Source: 2024 research data*

**Table 3** below explains the activities carried out in directing high-level abilities.

**Table 3.** Activities carried out in directing high-level abilities

No.	Schools	Form of activity
1.	SMP Negeri 7 Bandung	Providing gradual difficulty levels of questions, and providing HOTS cognitive domain questions at least in each chapter of the learning material.
2.	SMP Negeri 38 Bandung	Every Wednesday, there is a joint reading program in the field to improve students' literacy skills.
3.	SMP Negeri 54 Bandung	Provide literacy questions so students can digest the problem before working on the questions.
4.	SMP Negeri 19 Bandung	Providing facilities for additional HOTS domain questions so that proficient students and students still under guidance are not forced to work on HOTS domain questions, directing learning to the HOTS domain, even though the learning objectives are general.

*Source: 2024 interview data*

Determination of learning objectives is carried out after carrying out the diagnostic assessment analysis process. The implementation of diagnostic assessments by some sources is focused on the beginning of the semester, before the learning process. However, diagnostic assessment activities cannot only be carried out at the start of the semester. Diagnostic assessments can be implemented periodically, such as at the beginning of the semester, mid-semester, end of semester, or even when new material is about to be implemented, a diagnostic assessment can be carried out first. To provide an overview of students' abilities in a subject matter, teachers can conduct cognitive diagnostic assessments regularly at the beginning when they are about to study new material, when the learning process has been completed, and at other times during the semester (Azis & Lubis, 2023). It is feared that if teachers only carry out diagnostic assessments at the beginning of the semester, they will not know the condition of students' cognitive abilities later, whether the students have experienced an increase in ability, have not experienced an increase, or have even decreased their cognitive skills.

The learning objectives that have been determined only implement aspects of low-level thinking, including remembering, understanding, and applying. At the same time, aspects of high-level thinking have not been implemented. This must be a concern for teachers, so that in learning, students are not only given material, but teachers can also make students directly involved in learning, such as forming small groups in making a project, which will thus strengthen students' abilities and learning will be more meaningful (Sari & Sutihat, 2022).

The resource person at SMP Negeri 38 Bandung and SMPN 54 Bandung further revealed during the interview that HOTS-level questions are relative, depending on students' perception, because some students may consider LOTS questions to be HOTS questions. According to Bloom, each cognitive level has its achievement indicators based on this assumption. So it is irrelevant if students' ability determines the questions at a certain level. The difficulty or ease of the question depends on the process of working on it. Even though students find it challenging to work on LOTS questions, it does not mean the question is HOTS. Each cognitive level has its indicators, so the thinking process required to answer the question becomes the level of difficulty of the question. A question can be considered HOTS if designed to test analytical, evaluation, or creativity skills, regardless of whether the student can solve it (Maxnun *et al.*, 2024). The question categories do not change according to the students' abilities but are determined by the objectives and thinking processes required to answer them.

Based on the interview results, it was revealed that the learning objectives have not yet led to high-level thinking skills because of the low abilities of students. Giving questions and learning that gradually lead to learning that fulfills high-level thinking skills is good enough to do. With teachers knowing the low cognitive abilities of students, they should not let it be, and teachers should not be habituated to overcoming this. Teachers can ask questions that are not limited to theory and only measure basic abilities, but teachers need to stimulate students' thinking power (Febrianti *et al.*, 2021). The habituation that the resource person has carried out by giving literacy questions to students is one of the efforts that can be made to improve students' thinking power. Providing a habituation of story questions based on numeracy literacy will prepare students to play an active role in learning and improve critical thinking skills (Sahrina & El-Yunusi, 2024).

To avoid decreasing students' ability to learn, teachers can provide HOTS-based learning in accordance with 21st-century learning, which must provide students with the 4C skills (Tyas & Naibaho, 2021). As explained, high-level skills involve analyzing, evaluating, and creating. **Table 4** describes the HOTS question indicators relevant to the material on integers.

**Table 4.** Indicators and Example Questions on High-Level Thinking Skills

No.	Cognitive Level	Indicators	Example Questions
1.	Analytical skills	Students can analyze relationships, patterns, or properties of integers in a specific context.	In a math competition, each correct answer is scored 4, a wrong answer 2, and no answer -1. Out of 40 questions, Udin answered 30 correctly and six incorrectly. The score obtained by Udin is...
2.	Evaluation skills	Students can evaluate everyday problems involving integers.	Arya has a flash disk with a 1 GB or 1,024 MB capacity containing 250 MB of photos, 150 MB of Korean songs, 325 MB of Indonesian songs, and 200 MB of assignment files. If Arya wants to save a 300 MB video file, Arya must delete one of the existing files. If Arya wants to delete the smallest file, then the file that can be deleted so that he can save the video file is...

No.	Cognitive Level	Indicators	Example Questions
3.	Creative or creating skills	Students can design new problems relevant to everyday life involving integers.	Design a problem involving integers in everyday life, such as temperature or profit and loss in business. Include a complete solution and steps to solve it!

Sumber: (Utami *et al.*, 2023)

## CONCLUSION

Learning objectives are critical because they can help educators set the achievements that students must master and ensure that the content, methods, and learning assessments that will be used support the achievement of student competencies. Educators can use Bloom's taxonomy to determine the category of learning objectives based on the cognitive level to be achieved to improve students' cognitive development. Teachers can improve students' skills by defining learning objectives and providing practice questions in stages. Among them, teachers can start with questions that start from questions with low-level thinking skills, such as understanding basic concepts, which can then be increased to questions that are at a higher level than before, requiring analysis and evaluation. There is a need for gradual challenges so that students can build self-confidence first. That way, the direction of learning becomes more meaningful because students are encouraged to solve problems, think critically, and creatively.

## AUTHOR'S NOTE

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