

# Development of Competency Packing Higher Order Thinking Skill (HOTS) Teachers Elementary School

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## Abstract

Higher Order Thinking Skill (HOTS) learning for teachers is very important. The implementation of HOTS-based learning is believed to be able to improve the quality and competence of graduates in facing the era of free competition in the industrial revolution 4.0, along with the development of science and technology that continues to develop and affects change and we must adapt to changes in mental attitudes, knowledge, and skills. Development of Higher Order Thinking Skill (HOTS) learning, including: this higher thinking activity is not only applied in learning but needs to be evaluated with the same approach in order to be able to measure the level of student learning success in a valid way. The challenge in developing HOTS learning is the creativity and tenacity of teachers in planning, implementing and evaluating the development of competencies in packaging learning, namely attitudes, knowledge, and skills. The development of HOTS-based learning prioritizes students' critical thinking skills in solving learning problems. This skill will create a good mental attitude of students in solving the problems they face.

**Keywords:** Learning, *Higher, Order, Thinking, Skill.*

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## 1. INTRODUCTION

Teachers are professional educators with the main task of educating, teaching, guiding, directing, training, assessing, and evaluating students. Teachers as educators should properly understand their functions and duties in helping to educate the nation's children. The results of measuring student achievement based on PISA achievements in 2018 show that students are still weak in Higher Order Thinking Skills such as reasoning, analyzing, and evaluating. Therefore, students must be familiarized with questions and learning oriented to higher order thinking skills (Higher Order Thinking Skills) so that their critical thinking skills are encouraged. (Laporan Hasil Ujian Nasional, 2019).

Learning based on higher order thinking skills (HOTS) or critical thinking is recommended to be carried out in a quality education process. The implementation of HOTS-based learning is expected to be able to improve the quality and competence of

graduates in order to face the era of free competition in the industrial revolution 4.0 (Helmawati, 2019:1). Learning that involves higher-order thinking (Higher Order Thinking Skills / HOTS) is needed in the era of the industrial revolution 4.0 as it is today, science and technology that continues to develop affect changes that continue to take place without stopping in all fields because change continues, humans are required to can adapt through changes in mental attitudes, knowledge, and skills (Ihsan, 2020: 92).

Currently, the development of learning based on higher order thinking skills (HOTS) is sought to implement the PKP Program considering a regional approach, or known as zoning. Through this step, the SD Teacher Working Group (KKG), which has been conducted through the Gugus or Rayon, can be integrated through the zoning of teacher development and empowerment. This program is part of the Continuing Professional Development (PKB) program in accordance with Law No. 14 concerning teachers and lecturers which states that teacher competencies include

pedagogic competence, personality competence, social competence, and professional competence obtained through professional education (Undang-Undang Republik Indonesia, 2005).

Teachers seek to improve their professional and pedagogical competencies so that educational goals can be achieved properly. Through professional and pedagogical abilities teachers can promote positive behavior change both in the classroom and in the school environment. The professional competence of teachers affects changes in teacher learning competencies in carrying out their teaching responsibilities (Kemendikbud, 2019).

Based on the description above, researchers are interested in conducting research on the development of teacher competence in teaching Higher Order Thinking Skills (HOTS). In this study the researchers chose the research location in the Class of SDN Kuripan 2 and SDN Kebun Bunga 6 Banjarmasin. Because there has been no research examining the school. The purpose of this study, researchers can determine the development of teacher competence in teaching Higher Order

Thinking Skill (HOTS). Teacher of aspects; 1) preparation; 2) implementation; and 3) evaluation of Higher Order Thinking Skill (HOTS) learning.

## 2. METHODOLOGY

This study uses a qualitative descriptive approach with a multi-site research design. The research was conducted in more than one location, namely there are 2 research locations, namely SDN Kuripan 2 and SDN Kebun Bunga 6 Banjarmasin. The results of this study are in the form of narrative sentences resulting from data analysis from interviews, observations and documentation that describe the facts of developing competence in teaching Higher Order Thinking Skill (HOTS) Elementary School Teachers.

The subjects in the study consisted of principals, and teachers. Therefore, the criteria used as the sampling technique is purposive, which refers to part or all of the educational process at the research site. The process of data analysis is carried out by going through the steps described as follows:

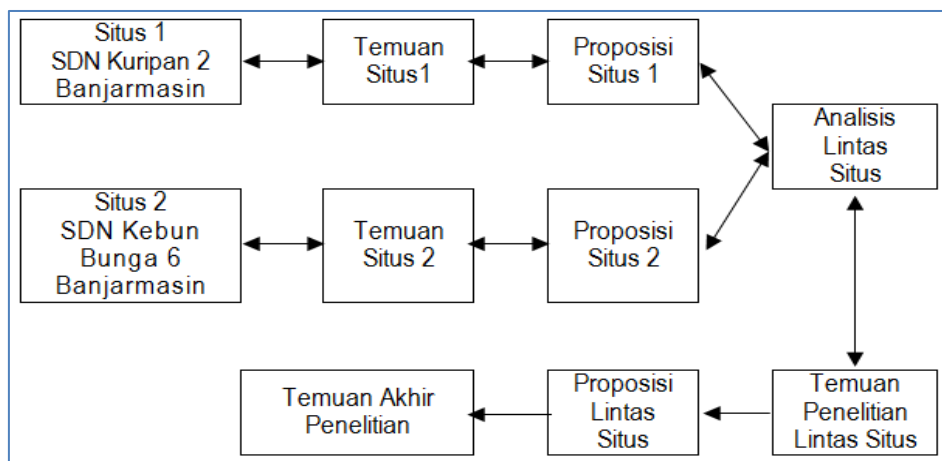


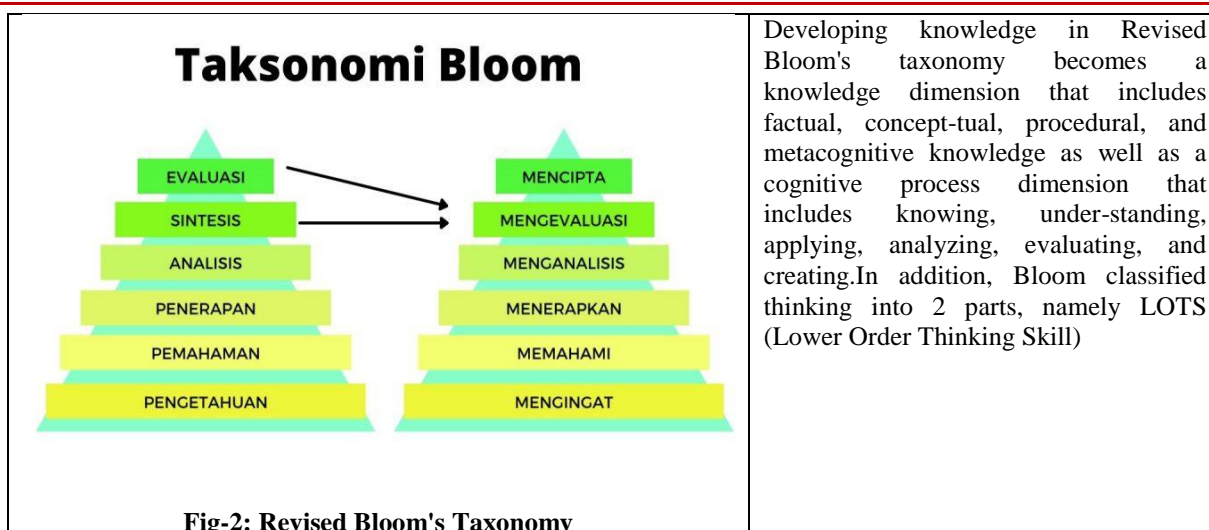
Fig-1: Cross-Site Data Analysis Activities

## 3. RESULTS AND DISCUSSION

### 3.1 Preparation of Learning Packaging Development (HOTS)

Based on the results of research obtained in the field, the data that can be observed is in the preparation of teacher competency development in teaching Higher Order Thinking Skill (HOTS) class teachers at SDN Kuripan 2 and SDN Kebun Bunga 6 Banjarmasin can be described as follows:

Planting the concept of HOTS learning with the implementation of the 2013 Curriculum, through KKG and PKB activities on the basis of Permendikbud Number 21 of 2016 and according to Bloom Taxonomy, which was introduced by Benjamin Bloom in 1956 and developed by Anderson and Krathwol in 2001, namely the revised Bloom's taxonomy is used as a reference on Graduate Competency Standards. Which divides the achievement of learning outcomes into 3 dimensions, namely cognitive, affective, and psychomotor dimensions.



And HOTS (Higher Order Thinking Skill) or low-level thinking competencies and higher-order thinking competencies, namely higher-order thinking skills are skills to connect ideas and facts, analyze, explain, hypothesize, synthesize or arrive at the stage of concluding to solve problems.

Preparation of the model for the development of the world of teacher education packaging Higher Order Thinking Skill (HOTS) learning along with the development of science and technology, the implementation of the 2013 curriculum (K-13) brings consequences for teachers applying the scientific approach (5M) in learning which includes observing, asking questions, gathering information, reasoning/associating, and communicating each component of the teaching material in its integration into the real life of students. HOTS activities can help skilled students seek knowledge in inductive and deductive reasoning to think about answers or identify and explore from a lesson, even create.

The Partnership 21st Century Skills (2011) formulates a 21st century learning framework. Within this framework, academic content in the form of writing, reading, arithmetic, critical thinking, problem solving, collaboration and creativity and innovation are very important in learning activities in this century. 21. Then HOTS learning is the answer in responding to challenges in 21st century learning. In addition, with HOTS students will get used to thinking critically and creatively both in decision making and problem solving related to analyzing, evaluating and creating (Anderson & Krathwohl, 2012)

With K13 to achieve the goal of forming HOTS in students, a learning process is needed that must accommodate the development of HOTS. Active learning, student-centred, the formation of curiosity (want to ask) and assessment based on HOTS is one way for students to achieve HOTS. From the technical side of classroom learning, achieving HOTS can be

done at least in several ways, one of which is by providing some motivation to increase students' enthusiasm for critical thinking. The way the teacher develops can be in the form of 1) opening and ending the lesson with questions that lead to higher-order thinking skills, 2) placing brainstorming activities in the middle of the lesson to encourage students to find ideas and think creatively, 3) giving open ended-based assignments as homework. To find out their creativity and understanding of the lessons they have learned to have higher order thinking competence (HOTS), teachers can train students by asking questions in the form of HOTS-based test questions. Higher Order Thinking Skill (HOTS) based test questions can help students develop competence in higher order thinking.

Teachers of SD Kauripan 2 and Kebun Bunga 6 already have the competencies referred to in relation to the competence of critical thinking, reflective, metacognitive, and creative thinking objectives in the 2013 curriculum in PP no. 17 of 2010, to prepare Indonesian people to have the competence to live as individuals and citizens who are faithful, productive, creative, innovative, and affective and able to contribute to the life of society, nation, state and world civilization, this is in accordance with the opinion King (2014), Johnson (2014), dan Sukmadinata, end Erliani (2012) that learning with the HOTS approach is defined as thinking competence in which there are critical, logical, reflective, metacognitive, and creative thinking competencies. Critical thinking is a systematic process that allows students to evaluate the evidence, assumptions, logic, and language that underlie other people's statements. Creative thinking is a mental activity to increase originality and insight in developing something (generating).

The learning strategy that I apply for HOT learning is inquiry, in that way, the teacher can stimulate the thinking competence of students by developing systematic, logical, and critical thinking competencies, or developing intellectual competence as

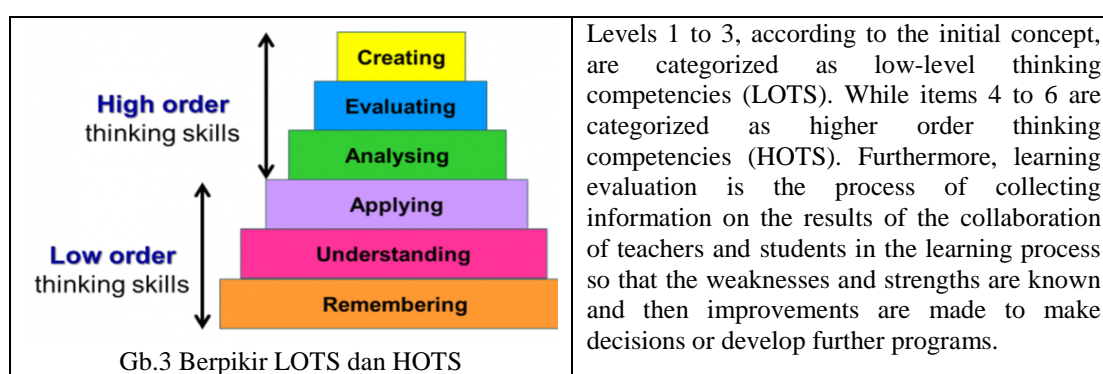
part of the mental process. The learning strategy applied for HOT learning is inquiry, in order to train children to think logically, it is an activity to solve problems, both mathematical problems, or other problems found in everyday life rationally and can be accepted by everyone.

Developing High Order Thinking Skills, in the form of training children to apply the level of thinking: (a). Analyzing (Analyzing); ie students are able to analyze incoming information and divide it into smaller parts to recognize patterns or relationships, (b). assessing (Evaluating) students are able to provide an assessment of work procedures and others, using suitable criteria or existing standards to ensure the value of effectiveness or benefits. (c). Creating (Creating)

students put elements together elements that become a new pattern or produce something

Benjamin S. Bloom's concept, in the book *Taxonomy of Educational Objectives* (1956), is actually a learning goal which is divided into three domains. The three domains are Cognitive, which is a mental skill (around knowledge); Affective, emotional side (about attitudes and feelings); and Psychomotor, which is related to physical competence (skills).

In learning with thinking competence levels which are divided into low and high levels, it is part of one of the domains of (1) remembering, (2) understanding, (3) applying, (4) analyzing. ), (5) evaluate (evaluate), (6) create (create).



Levels 1 to 3, according to the initial concept, are categorized as low-level thinking competencies (LOTS). While items 4 to 6 are categorized as higher order thinking competencies (HOTS). Furthermore, learning evaluation is the process of collecting information on the results of the collaboration of teachers and students in the learning process so that the weaknesses and strengths are known and then improvements are made to make decisions or develop further programs.

(Sudijono, 2016), (Eko, 2011), (Arikunto & Safruddin, 2004) and (Sanjaya, 2018). The combination of the dimensions of knowledge and thought processes can be seen below.

Thinking process C1 s.d. C3 with all dimensions of knowledge and C1 to d. C6 with the dimension of factual knowledge is in the category of low-level thinking skills, while for C4 to d. C6 for the dimensions of conceptual, procedural, and metacognitive knowledge is a category of higher order thinking skills.

Students, he said, must have higher order thinking competencies to solve complex problems, think critically and rationally. They must also be able to face the challenges of an increasingly complex era. "Our children must be encouraged and developed higher order thinking competencies, not just memorizing lessons and knowledge, but being able to analyze, synthesize, and create. If children are familiarized with challenging questions or learning, then their potential can be stimulated to develop. "

To be able to arrange questions that require higher reasoning, there are several ways that can be used as guidelines for teachers. First, the material to be asked involves various aspects: understanding, application, synthesis, analysis or evaluation, and not just memory. Second, each item or question needs to be

given a basic question or stimulus. Third, the questions given must be able to measure the competence of the teacher's role in developing critical thinking. Fourth, the questions given must be able to measure problem solving skills.

Planning for the implementation of learning must be prepared properly to obtain learning outcomes in accordance with learning objectives. Learning implementation planning includes the syllabus and learning implementation plans. The making of a learning implementation plan by the teacher for guidance in teaching in the classroom refers to the syllabus that has been made by the government. In the implementation of the learning, several things need to be done which include the planning stage which includes the mapping of basic competencies, the development of a theme network, and the development of a syllabus and the preparation of a lesson plan.

### 3.1.1 Core Competency Mapping Planning Stage

This mapping activity was carried out to obtain a comprehensive and complete picture of all competency standards, basic competencies and indicators of various subjects that were combined in the chosen theme.

**The activities carried out are:**

- a). The elaboration of Core Competencies and Basic Competencies into indicators.**

In developing indicators, teachers need to pay attention to the following: 1) indicators are developed according to the characteristics of students 2) indicators are developed according to the characteristics of subjects 3) formulated in operational verbs that are measurable or observable.

#### **b). Determine the theme.**

The method of determining the theme can be done in two ways, namely: The first way, studying the competency standards and basic competencies contained in each subject, followed by determining the appropriate theme. The second way is to determine in advance the themes of binding integration, to determine these themes; the teacher can work with students so that they are in accordance with the interests and needs of children.

In setting a theme, it is necessary to pay attention to several considerations, namely: a) paying attention to the environment closest to students: b) From the easiest to the difficult c) From the simple to the complex d) From the concrete to the abstract. e) The theme chosen must allow the thinking process to occur in students f) The scope of the theme is adjusted to the age and development of students, including their interests, needs, and competencies.

#### **c) Other Planning Preparation**

After determining the theme, it is determined Identification and analysis of Competency Standards, Identification and analysis of Competency Standards, Establishing Theme Networks, Preparation of Syllabus, Preparation of Learning Plans

Basic Competencies and Indicators Identify and analyze for each Competency Standard, Basic Competence and indicators that are suitable for each theme so that all competency standards, basic competencies and indicators are evenly distributed. Make a network of themes that connect basic competencies and indicators with a unifying theme. With the network of themes, it will be seen the relationship between the themes, basic competencies and indicators of each subject. This theme network can be developed according to the time allocation of each theme.

The results of all processes that have been carried out at the initial stage are used as the basis for the preparation of the syllabus. The syllabus component consists of competency standards, basic competencies, indicators, learning experiences, tools/sources, and assessments. The teacher after determining the theme is then determined Identification and analysis of Competency Standards, Identification and analysis of Competency Standards, Establishing Theme Networks, Preparation of Syllabus, and Preparation of Learning Plans.

The components of the thematic learning plan include: a. Subject identity (name of subject to be combined, class, semester, and time/number of meeting hours allocated). b. Basic competencies and indicators to be implemented. c. The main materials and their descriptions that students need to learn in order to achieve basic competencies and indicators. d. Learning strategies (concrete learning activities that students must do in interacting with learning materials and learning resources to master basic competencies and indicators, these activities are contained in the opening, core and closing activities). e. The tools and media used to facilitate the achievement of basic competencies, as well as the sources of materials used in thematic learning activities are in accordance with the basic competencies that must be mastered. f. Assessment and follow-up (procedures and instruments that will be used to assess the learning achievement of students and follow-up on the results of the assessment).

#### **3.1.2 Learning Implementation Plan**

The implementation of Higher Order Thinking Skills learning includes the stages of analysis, evaluation, and creation. In the implementation of Higher Order Thinking Skills learning, teachers must cultivate critical thinking skills, creative thinking and problem solving in students.

The learning implementation plan that has been designed by the classroom teacher has designed a good learning implementation plan, the teacher at the school said it is very important to prepare an implementation plan before carrying out learning so that the implementation of learning can run well. The following is a form of the Higher Order Thinking Skills learning plan:

Stages of activities the implementation of learning is carried out using three stages of activities, namely opening/initial/introductory activities, core activities, and closing activities. The time allocation for each stage (2 x 35 minutes) is the opening activity of approximately one hour of 10 minutes of lessons, 50 minutes of core activities and 10 minutes of closing activities).

At this stage, character development and literacy are applied in each stage of learning based on the syntax of the model or learning strategy used.

##### **a. Introductory/initial/opening activities.**

This activity is carried out mainly to create an early learning atmosphere to encourage students to focus on themselves so that they are able to follow the learning process well. The nature of the opening activity is an activity to warm up.

##### **b. Core activities.**

The core activities focus on activities aimed at developing reading, writing and arithmetic

competencies. The presentation of learning materials is carried out using various strategies/methods that vary and can be done classically, small groups, or individually.

### c. Closing/Ending Activities and Follow-up.

The nature of the closing activity is to calm. Some examples of final/closing activities that can be done are concluding/disclosing the learning outcomes that have been carried out.

To further clarify the integration of Higher Order Thinking Skills (HOTS) in learning design, see the Learning Plan for the development of Higher Order Thinking Skills (HOTS) starting from the application of Order Thinking Skill learning at the elementary level as an effort to improve the quality of output and educational outcomes in Indonesia. The 2013 curriculum as a means of achieving HOTS since the education unit level is a very good effort in improving the quality of students' thinking.

The key to achieving the HOTS level is in learning, so the teacher has a very important role in making students able to be at the HOTS level. Planning starting from the opening stage to ending the lesson with questions that lead to higher order thinking skills, placing brainstorming activities in the middle of the lesson to encourage students to find ideas and think creatively, and provide open ended-based assignments as homework to find out their creativity and understanding. To the lessons learned.

## 3.2 Implementation of Higher Order Skills Thinking (HOTS) Learning

Based on the research results obtained in the field, the data that can be observed is in the implementation of Higher Order Thinking Skill (HOTS) class teachers at SDN Kuripan 2 and SDN Kebun Bunga 6 Banjarmasin can be described as follows:

There are 4 aspects of the focus of the study carried out in this study, including: teachers' understanding of HOTS, lesson planning, implementation of learning and obstacles faced by teachers in implementing HOTS learning. This learning has an impact on the quality of education, the importance of implementing this learning in schools is very influential for students, HOTS learning requires students to be able to think critically, creatively and be able to solve problems. HOTS learning starts from C4-C6 while Lower Order Thinking Skill starts from C1-C3.

### 3.2.1 Implementation of Higher Order Thinking Skills Pembelajaran Learning

Before carrying out learning the teacher first prepares a learning implementation plan, and then prepares learning media that will be used during the learning process. In the implementation of Higher Order

Thinking Skills learning activities, the teacher carries out 3 stages that direct students to become learners who have Higher Order Thinking Skills skills. The stages consist of analysis (C4), evaluation (C5), and creating (C6). (Mariani, 2014).

#### a) Analysis (C4)

The analysis carried out by students is in the form of direct observation, the observations made are by observing/analyzing the text contained in the book and finding out the function of the learning media provided by the teacher.

#### b) Evaluation (C5)

At the evaluation stage carried out by the teacher to the students is to ask the students to provide conclusions from the learning that has been done, if the conclusions given by the students are not clear then the teacher will provide reinforcement for the answers that have been given by the students.

#### c) Creating (C6).

At the stage of creating the activities carried out by the teacher is to ask students to be able to produce a work based on the subject matter that has been implemented, the work created by students can be in the form of writing, reading, or works of art.

## 3.2.2 Obstacles faced by teachers in implementing HOTS learning

The obstacles faced by teachers in implementing Higher Order Thinking Skills learning are in the allocation of time where Higher Order Thinking Skills learning takes a long time because when carrying out the analysis, evaluation, and creating stages it takes quite a lot of time.

## 3.3 Evaluation of Higher Order Skills Thinking (HOTS)

Based on the results of research obtained in the field, the data that can be observed is the evaluation of Higher Order Thinking Skill (HOTS) class teachers at SDN Kuripan 2 and SDN Kebun Bunga 6 Banjarmasin can be described as follows:

Permendikbud No. 23 of 2016 defines assessment as the process of collecting and processing information to measure the achievement of student learning outcomes. This assessment process is carried out by educators, education units and the government. The aim is to monitor the development of learning outcomes, assess the achievement of graduate competency standards and assess the achievement of graduate competencies nationally at a certain time.

Assessment is carried out through three approaches, namely assessment of learning (final assessment of learning), assessment for learning (assessment for learning), and assessment as learning (assessment as learning). Evaluation in learning

emphasizes the mapping process rather than making judgments (decisions) on students. So the assessment using the HOTS approach includes attitude assessment, knowledge assessment, and skills assessment.

The attitude assessment according to the opinion of Marzano & Pickering (1997), includes five dimensions, namely, 1) attitudes and perceptions. 2) acquire and integrate knowledge. 3) expand and refine knowledge. 4) use knowledge meaningfully. 5) thinking behavior. While the assessment of knowledge is in accordance with opinion Anderson; Lorin, W; Krathwohl, David R (2011) includes factual knowledge, conceptual knowledge, procedural knowledge, and metacognitive knowledge. While the assessment of skills which includes the direction of thinking and acting. Higher Order Thinking Skill (HOTS) is one of the instruments used to photograph students' higher order thinking competencies. According to opinion Heong (Hanifah, 2019) "*higher order thinking is using the thinking widely to find new challenge. Higher order thinking demands someone to apply new information or knowledge that he has got and manipulates the information to reach possibility of answer in new situation.*" Higher-order thinking competence certainly requires the competence to manage information to reach answers in new situations.

HOTS as a transfer process in the context of learning is giving birth to meaningful learning, namely the competence of students in applying what has been learned into new situations without the direction or instructions of educators or others. HOTS as a critical thinking process in the context of learning is to form students who are able to think logically (reasonably), reflectively, and make decisions independently. HOTS as a problem solving process is to make students able to solve real problems in real life, which are generally unique so that the completion procedures are also unique and not routine. So far, we are familiar with Bloom's taxonomy of knowledge, where the level of knowledge is divided into 6 levels, namely, knowledge, comprehensive, application, analysis, synthesis, and evaluation.

In its development, this taxonomy underwent a change (revision) to remember, understand, apply, analyze, evaluate and create. It is at these last three levels that HOTS is located and is used as a reference for conducting further analysis in HOTS learning to measure student competence through indicators of critical thinking competence, creative thinking competence, problem solving competence and decision making.

The goal is to give students competence to perform metacognitive analysis that has many sources of knowledge. This competency will help students to make decisions on a new case or a case that requires specific solutions. In addition, the ability to analyze

metacognitively will help students to find a problem solving process that is not result-oriented. Then the competence of the teacher must be able to support the application of HOTS in the learning classroom and be able to take measurements/assessments with valid measuring instruments.

HOTS includes students' competence in managing new and interrelated information to achieve goals in other confusing situations. This competency must be supported by logical analytical competence and able to relate concepts and facts so that they can make a decision that is not only based on estimates but also based on scientific facts and data.

The next challenge when HOTS is applied is the competence of teachers, students, and infrastructure. The HOTS concept can be implemented in the classroom, and has applied HOTS in learning activities but we have difficulty designing and implementing HOTS-based evaluations, and difficulties in delivering learning materials, according to the idea Rifa'i, Serevina, V., & Delina, M. (2018) The main point in the development of learning evaluation is to design and implement HOTS-based evaluations even though they have applied HOTS to learning activities. The essence of the assessment is a match between planning, objectives, implementation, and assessment.

A teacher must be skilled in making learning evaluation instruments according to the level of the education unit. In developing the HOTS assessment instrument, several characteristics must be considered in measuring higher order thinking. HOTS Assessment Characteristics, namely:

1. Measuring higher order thinking competence, namely the process of analyzing, reflecting, giving arguments (reasons), applying concepts to different situations, compiling, creating.
2. Divergent in nature, allowing students to give different answers according to the thinking process and the point of view used because it measures analytical, critical, and creative thinking processes which tend to be unique or have different responses for each individual.
3. Using multiple representations, namely generally not presenting all information explicitly, but forcing students to explore the implied information themselves.
4. Based on contextual problems, which is an assessment based on real situations in everyday life, where students are expected to be able to apply learning concepts in class to solve problems. This understanding also includes how the skills of students to relate (relate), interpret (interpret), apply (apply) and integrate (integrate) knowledge in classroom learning to solve problems in real contexts.
5. Using various forms of questions, namely various questions in a test kit (HOTS questions) as used in

PISA, aiming to provide more detailed and comprehensive information about the competence of test takers.

Thus, to conduct a HOTS-based evaluation, mastery of teaching materials is needed, skills in writing questions and teacher creativity in understanding conditions that are appropriate to their area. In preparing the HOTS-based evaluation instrument, the following steps are needed: 1) analyzing basic competencies (kd). 2) Arrange a grid of questions. 3) choose the right and contextual stimulus. 4) Write the question items according to the question grid. 5) create scoring guidelines (rubrics) or answer keys. The implementation of this learning evaluation is of course intended for students in high grade elementary schools, where the subject matter is more complex and diverse.

#### 4. CONCLUSION

Based on the data analysis of the results of this study, it can be concluded that the teachers of SDN Kuripan 2 and SDN Kebun Bunga 6 Banjarmasin have competence in mastering theory and practice in packaging Higher Order Thinking Skill (HOTS) learning. Students to improve the quality of learning in elementary schools, strategies for preparing HOTS-oriented learning, HOTS-based learning methods and practice are provided in the form of activities to compose HOTS-oriented learning based on the competency baseline of students for each elementary school.

Teachers at SDN Kuripan 2 and SDN Kebun Bunga 6 Banjarmasin, most of the participants have the competence to develop HOTS-based learning, based on the findings of the participants' products, one of the skills that need to be improved is the skill to develop productive questions and make HOTS-based learning assessments.

#### 5. ACKNOWLEDGMENTS

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