

## Why We Should Implement HOTS-Based Learning In The 21st Century?

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### ABSTRACT

The 21<sup>st</sup> century is a century marked by globalization that occurs in society. Globalization refers to changes in various areas of life. The changes that exist also require humans to have various abilities and skills to survive in this environment. The area most affected is Education. As the main place to gain knowledge, Education needs to adapt to the changes in the 21<sup>st</sup> century. Education needs to create new methods that can develop the skills needed in the 21<sup>st</sup> century. HOTS- based learning is one of the answers to the needs of the 21<sup>st</sup> century. This learning method consists of three cognitive processes as the top elements in Bloom's taxonomy. There are analysis (C4), evaluation (C5), and creation (C6). All of it is a part of critical thinking skills. Therefore, HOTS-based learning can meet the needs of 21<sup>st</sup> century skills, one of which is the ability to think critically.

**Keywords:** *HOTS, learning, thinking critically*

### INTRODUCTION

Human life in the 21<sup>st</sup> century undergoes major changes when compared to life in the previous century. The 21<sup>st</sup> century requires a variety of good quality resources to support various existing developments. This is marked by the globalization that takes place in society. Globalization is the most prominent process and changes all aspects of everyday life (Sofradzija et al., 2021). Globalization requires humans to provide innovation in planning, implementing actions, and evaluating processes. People can contribute to and benefit from globalization only if they are prepared with the necessary knowledge, skills and abilities. It can be hypothesized that humans in the 21<sup>st</sup> century need various updates to deal with the developments in various fields. High-quality human capital is needed in tackling 21<sup>st</sup> century demands (Mega & Handayani, 2020).

Various information and communication technologies are continuously used to find various innovations as demands of globalization. The instant development of information and communication technology (ICT) has made changes and influenced human learning in the 21<sup>st</sup> century (Kwangmuang et al., 2021). It means the 21<sup>st</sup> century is also marked by a high human need for knowledge. Knowledge is known to be closely related to education. According to the Organization for Economic Co-operation and Development (OECD) in 2018, education has an important role. It is knowledge, attitudes, values, and skills that enable students to contribute to have a better future (Azahary & Ratmanida, 2021). The efforts to fulfill human need for knowledge can be solved through education. Ideally, globalization must be seen as an event that demands broad systemic changes in education (Misra, 2012). Education at this time will be an effort for humans to increase knowledge which will refer to increasing good quality human resources. The role of education in supporting the need for good quality human resources is no longer only for the interest of certain groups. Education in this century has become an important part of national development (Wijaya et al., 2016). So, the current role of education today is crucial, as a nation builder in facing the globalization era of the 21<sup>st</sup> century. This role also includes the people that contribute to it.

Departing from demands of the education of the 21<sup>st</sup> century, the Ministry of Education and Culture in Indonesia has formulated something new. This is a paradigm that can demonstrate a student's ability to seek information from various sources, formulate

problems, think analytically, and collaborate, as well as collaborate in solving problems. In the 21<sup>st</sup> century, education aspect currently prioritizes the first, skills in terms of learning and innovation including creativity, critical thinking and problem solving, communication and collaboration, second skills in terms of ICT including information literacy, media literacy, information technology literacy, and the third life and career skills include being flexible and able to adapt, having initiative and self-direction, having social and cross-cultural skills as well as being productive and accountable (Auliya Vilda Ghasya & Kartono, 2020). Thus, the government in charge can improve education quality in Indonesia through learning in schools.

In this case, the Indonesian government has made efforts to improve Indonesian education through the educational curriculum (Maulidia & Pahlevi, 2020). In accordance with the current society, the learning management model must be adapted. Currently, the 2013 curriculum (K-13) implemented by the Indonesian government to replace the previous curriculum, Educational Unit Level curriculum or in Bahasa can be shortened to KTSP (Yulianti, 2015). The Indonesian Ministry of Education and Culture has continued to revise the 2013 curriculum from 2016, until the last revision was made in 2018. The results of the 2013 curriculum revision are aimed at making it easier for educators to implement it in schools.

The 2013 Curriculum purpose was designed to enable students to be more capable of making assumptions, asking questions, reasoning, and communicating (Feronica et al., 2021). The scope of improvement of the 2013 curriculum in the form of content standards and assessment standards, gives new demands to educators. This is also related to education in Indonesia which also faces the skills of the 21<sup>st</sup> century.

These skills are called the 4Cs, namely creativity, critical thinking, collaboration, and communication skills (Elfi & Syarif, 2021). These also relate to many skills such as identifying, analyzing, and solving problems creatively and logically to create the right decision (Saepuloh et al., 2021). In line with this, the schools must be transformed in a way that will allow students to develop their critical thinking, collaboration, communication, and creativity. Now, schools that apply the 2013 curriculum are expected to have a paradigm change dealing with its learning (Pratiwi & Mustadi, 2021).

That means Indonesia as a part of world has realized that critical thinking is one of the important aspects that must be possessed (Ningsih et al., 2020). These skills refer to higher order thinking skills (HOTS) (Kurniawan et al., 2021). Therefore, the current 2013 curriculum points up educators to have skills in preparing HOTS assessment instruments (Khalidun et al., 2020). Student’s HOTS can be developed through teaching and learning (Wilson & Narasuman, 2020). The success of HOTS development is also resolved by the alignment between the learning outcomes to be achieved and the assessment that is carried out. The purpose of this study is to know the development of HOTS in future education in Indonesia.

## LITERATURE REVIEW

### A. *Thinking Skills*

First of all, HOTS do not develop spontaneously (Huang et al., 2022). It developed by participation in educational activities. HOTS begin with the judgment of thinking skills. Thinking can be defined as the capability to make comparisons, analyze, synthesize, understand connections and forms. On the other hand, skill can be defined as a learned ability to create predetermined outcomes with maximum certainty; often with a minimum expenditure of time or effort or both (Özelçi & Çalışkan, 2019).

Now, the modern teaching process must focus on creating and developing thinking skills (Li & Sun, 2022). Thinking skills is the sense of competence to carry out the thought process which is necessary in our daily activities, especially in education. Thinking skills involve many concepts, there are analysis, application, syntax, and evaluating the information collected or generated by observation, experience or reflection (Yee et al., 2015). So, thinking skills are fundamental in the educational process.

### **B. Higher Order Thinking Skill (HOTS)**

Bloom was the first to propose the thinking skills model in 1956. It is called Bloom’s Taxonomy. Bloom divided thinking skills into three domains of education activities including cognitive skills, affective skills, and psychomotor skills. Because of limitations of Bloom’s taxonomy, Anderson also criticized. Anderson developed a revised version in classifying educational activities from simple to complex. This is a simplification of the nature of thinking and its relationship to the learning process. As the times are growing, Bloom’s taxonomy is considered to have some shortcomings in one-dimensional taxonomy. Later, Anderson and Marzano developed a new two-dimensional thinking model of education purpose, Marzano’s new taxonomy (Nguyễn & Nguyễn, 2017).

A taxonomy is a special type of framework, It contains categories that lie along a continuum (Soozandehfar & Adeli, 2016). Anderson et al also set out the categories of cognitive processes in a structured manner as follows:

- i. Remember (C1)  
Remembering consists of recognizing and recalling relevant information from long-term memory.
- ii. Understand (C2)  
Understanding can be defined by the ability to make your own meaning from educational material. It can be from reading or teacher explanations.
- iii. Apply (C3)  
Applying refers to using a learned method in every situation.
- iv. Analyze (C4)  
Analysis involves breaking knowledge down into its parts and thinking about how the parts connect to its overall structure.
- v. Evaluate (C5)  
Evaluation is the fifth of the six processes in the revised version. But it was the top in the origin taxonomy. It includes checking and critiquing.
- vi. Create (C6)  
Creating is the last of the six processes in the revised version. This skill involves putting things together to make something new. To accomplish creating tasks, learners generate, plan, and produce something.

According to this new version of taxonomy, each level of knowledge can correspond to each level of cognitive process. Therefore, a student can recall factual or procedural knowledge, understand conceptual or metacognitive knowledge, or analyze metacognitive or factual knowledge (Soozandehfar & Adeli, 2016).

In Marzano’s taxonomy, skills which are classified into comprehension are generally considered as lower-order thinking skills (LOTS), while the skills classified into the levels of analysis and utilization are the higher-order thinking skills (HOTS) (Nguyễn & Nguyễn, 2017). So, we can conclude that in the cognitive processes, HOTS is the highest level of the hierarchy. In other work, Brookhart defines HOTS as a transfer process from a problem and then the

problem is solved using critical thinking. Based on structured categories of cognitive processes by Anderson, HOTS are in C2 to C6 (Syaripudin, 2019). But in the revised Bloom’s taxonomy, thinking skills that can be considered as HOTS are selected from the top three levels of thinking skills (Bhattacharya & Mohalik, 2021). In line with higher order thinking skills by Bloom’s taxonomy, the questions type is C4 (analyzing questions), C5 (evaluation questions), and C6 (creating questions) (Sagala & Andriani, 2019). This is in line with what the government is trying to implement in education in Indonesia today.

HOTS as a learning strategy is a form of action plan that includes the use of methods and utilization of various sources or strengths in learning (Sianturi et al., 2020). HOTS can also be interpreted into three meanings. Its namely, as transfer, as problem solving, and as critical thinking skills (Arif, 2019). HOTS as a transfer means that students actively process it by paying attention to the newest and relevant information. Then, the students arrange them into related units and then combine new information with previous information. While as problem solving, HOTS means that students are expected to be able to solve problems with creative solutions in an effective way.

Critical thinking is also a part of HOTS (Prastiti et al., 2020). Critical thinking skills are intellectual skills that have become an issue in education in this modern industrial world. Critical thinking is the intelligently self- controlled process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and evaluating information collected from, or generated by, observation, experience, reflection, reasoning, or communication, as a guide to belief and action (Masduqi, 2011). These skills expect students to apply thoughtful judgments and generate a critical idea (Arif, 2019). Critical thinking can provide you with a more insightful understanding of yourself (Karakoç, 2016).

### **METHODOLOGY & DATA**

This research is qualitative research that can be classified as a literature review. Information in this research must be obtained from literature review on thinking skills and higher order thinking skills (HOTS). The process of this method in this study is:

1. Choose a review topic
2. Search for literature
3. Collect, read, and analyze the literature
4. Write a review
5. Reference

### **DISCUSSION**

Indonesia as a country with a very large population certainly still needs development. The young generation is one of the resources that is expected to achieve the highest level of education. Nowadays, Indonesia stands in a fast changing and interconnected world, the 21<sup>st</sup> century. Here, education must change to prepare students for success in life. Therefore, HOTS is integrated in all school subjects.

On the other hand, the 21<sup>st</sup> century is full of knowledge. The flow of globalization and the openness of information and technology is growing rapidly, bringing changes in all aspects of life in this century (Miterianifa et al., 2021). All these aspects need significant changes on the role of education and technology (Yáñez et al., 2015). It means in this century, education will face new challenges in how to make the right changes (Saptono et al., 2020). Traditionally, the educational process includes teaching and learning. More than that, it’s all about the learning process.

According to the 2013 curriculum (K13) standard process as listed in Permendikbud Number 22 of 2016, the learning process consists of planning, implementation, and assessment. Learning how to plan includes preparation of learning implementation plan, media and resource, assessment tool and also learning scenario. While learning implementation includes preliminary activities, core and cover that is adapted to the learning principles of 2013 curriculum. Then, learning assessment means how to see students' achievement in certain subjects (Pratama & Retnawati, 2018). The learning paradigm of the 21<sup>st</sup> century leads to the development of student's competence. The competences are critical thinking, communication, collaboration, creative thinking, and innovation (Sumardi et al., 2020).

Now, the government in Indonesia states that HOTS is designated for the student learning process. Based on so much research, the low thinking ability of students is caused by the lack of implementation of HOTS-based learning in the learning process at school. Therefore, the government suppose that the current education process must be focused on high-level thinking skills. Moreover, most educators agreed that developing HOTS among the students is necessary to improve student's skills to create nations that are competent enough in the 21<sup>st</sup> century (Singh & Marappan, 2020). Based on some research, curriculum changes, pedagogies, and assessments are the components of HOTS implementation (Suherman et al., 2020).

Developing thinking skills can be derived from the Bloom's Taxonomy Model that encourages knowledge and the shaping of skills through cognitive domains. The implementation of HOTS can produce many solutions. According to Ariyana, Bestary, & Mohandas (2018), the aim of learning HOTS is to ensure all students can evaluate, analyze or develop their understanding. Learning HOTS will also improve an individual's mind; leading to the production of a variety of alternatives, ideas, actions, solutions and design.

## CONCLUSION

Currently, humans are in the 21st century which is marked by globalization. In this century, many changes have occurred and have led to new demands. These new demands are explained on 21st century skills. Humans need to meet this new demand by improving their quality, especially for the younger generation. One of the aspects needed in achieving high-quality of human is education.

Because of it, teachers as instructors in school should be more critical in arranging the lesson plans. Their lesson plans mostly should be dealing with the targeted competence and learning core activities based on 21<sup>st</sup> century skills. HOTS-based learning is the answer to the educational needs of the 21<sup>st</sup> century. HOTS- based learning simply is a learning system that applies higher-order thinking skills to the students. HOTS, which are developed from year to year, contain skills that are in line with the dynamics of the 21st century. Therefore, education must also be prepared to face these dynamics by preparing the students with higher-order thinking skills.

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