

CHAPTER II

THEORETICAL REVIEW

A. National Examination

1. The Definition of National Examination

According to Gultom, National Examination attempts to evaluate the quality of education nationally through establishing a national educational standard.¹ Besides that, Regulation National Standard of Education (Badan Standar Nasional Pendidikan) Number : 0044/P/BSNP/XI/2017 about standard operational procedure employment of national year examination 2017/2018 states that “National examination is an activity measurement of achievement of graduate competencies in certain subjects nationally by referring to Graduates’ Competency Standards (Standar Kompetensi Lulusan).”²

In conclusions, National Examination is a tool to measure the competency and achievement of a graduate specific subject nationally held annually throughout the country to measure students’ achievement at the end of a learning period in each level.

¹ Abdullah Alhadza and Zulkifli M, “National Examination and The Quality of Education in Indonesia”, *Advances in Social Sciences Research Journal*, Vol.4, No.21 (November, 2017), p.2.

² BSNP, *Prosedur*, p. 8.

2. The Objectives and Benefits of National Examination

Based on the pocket book “Tanya Jawab UN” that compiled by BSNP the objective of National Examination are :

(a) National Examination aims to measure achievement of graduate competencies in subjects certain nationally with reference to Graduates’ Competency Standards (Standar Kompetensi Lulusan); (b) National Examination as a sub-system assessment in the National Education Standards (Standar Nasional Pendidikan) becomes one of the benchmarks for achieving SNP in the context of guarantee and quality improvement education.³

And the benefits are:

(a) Mapping the quality of educational programs and or educational units; (b) Consideration of selection for the next level of education; (c) The basis of fostering and providing assistance to education units for equity and improving the quality of education.⁴

Also the benefits for Regional Governments :

The Regional Governments can utilize the results of the national examination to carry out program planning fostering educational units in order to improve the quality of excellent graduates competitive, both at the local, national and global levels.⁵

B. Higher Order Thinking Skill (HOTS)

3. ³ BSNP, *Tanya Jawab Pelaksanaan Ujian Nasional 2018*, (Jakarta: BSNP, 2017), p.

⁴ BSNP, *Tanya Jawab*, p. 3.

⁵ BSNP, *Tanya Jawab*, p. 3.

1. The Understanding of Higher Order Thinking Skill

Susan M. Brookhart states that she has three categories about definition of the higher order thinking, (1) those that define higher-order thinking in terms of *transfer*, (2) those that define it in terms of *critical thinking*, and (3) those that define it in terms of *problem solving*.⁶

In the first category Higher-order thinking in terms of transfer means the teaching goal behind any of the cognitive taxonomies is equipping students to be able to do transfer⁷. It means the students to be able to relate their learning to another elements or prior knowledge.

In the second category Higher-order thinking as critical thinking. Brookhart explains that, in this case, “being able to think” means students can apply wise judgement or produce a reasoned critique.⁸ The goal of teaching here is seen as equipping students to be able to reason, reflect, and make sound decisions.

In the last is the Higher-order thinking as problem solving.⁹ The goal of teaching is equipping students to be able to identify and solve problems in their academic work and in life. This includes solving problems that are set for them and solving new

⁶ Brookhart, *How to Assess*, p. 3.

⁷ Brookhart, *How to Assess*, p. 5.

⁸ Brookhart, *How to Assess*, p. 5.

⁹ Brookhart, *How to Assess*, p. 7.

problems that they define themselves, creating something new as the solution. In this case, being able to think means students can solve problems and work creatively.

Furthermore, Heong *et al* as cited by Merta *et al* also states that Higher order thinking is using thinking widely to find new challenge.¹⁰ It requires someone to apply new information or prior knowledge and manipulate the information to reach possible answer in new situation.

To sum up, the higher order thinking skill is the ability to think about your own thinking in such a way as to transfer the knowledge and solve the problems in real life.

2. The Implication of Higher Order Thinking Skills

There are so many benefits from thinking of the higher order for learning process, Arthur Lewis and David Smith has several implication for classroom teachers: (1) learning to be effective in higher order thinking is important for everyone (2) ...it is possible for a learner to achieve his or her purpose through the recall of information...(3) the teaching of basic higher order skills may be closely interwoven in the classroom, (4)...for a

¹⁰ Merta Dhewa Kusuma, Undang Rosidin, Abdurrahman, and Agus Suyatna, "The Development of Higher Order Thinking Skill (HOTS) Instrument Assessment In Physics Study", *IOSR Journal of Research & Method in Education (IOSR-JRME)*, Vol. 7, 2017 Issue 1 Ver. V (Januari – Februari, 2017), p. 26.

learner to achieve his or her purpose through the recall of information, etc.¹¹ Besides that, Brookhart also claims that the higher order thinking not only improve their thinking skills but also their overall performance.¹² The chairman of BSNP, Bambang Suryadi also state that the purpose of introducing the HOTS in the assessment is to encourage students to do high-level reasoning, so that they are not fixated on one pattern of answers generated from the memorization process, without knowing scientific concepts.¹³

In summary, the implication of the higher order thinking skill is important for better outcomes and improve how students' thinking in teaching and learning process.

3. The Regulation of the Minister of Educational and Culture of Indonesia Related HOTS

In the regulation of the Minister of Education and Culture of the Republic of Indonesia number 54 of 2013, it was explained that "Graduates' Competency Standards are qualifications of graduates' abilities which include attitudes, knowledge, and

¹¹ Arthur Lewis and David Smith, "Defining Higher Order Thinking", *Theory Into Practice*, (London: Routledge, 2009), p. 136.

¹² Brookhart, *How to Assess*, p. 8.

¹³ BSNP, "Penerapan Soal Model Penalaran dalam Ujian Nasional: Apa dan Mengapa?", *Buletin BSNP* (June, 2, 2018), p. 5.

skill”.¹⁴ It means that in measuring the achievement of learning outcomes not only on the ability of students to master learning material or only in the aspects of knowledge (cognitive) but measuring student learning outcomes must also be measured from three aspects in a comprehensive manner namely knowledge (cognitive), attitude (affection), and skills (psychomotor).

Based on the Minister of Education and Culture Regulation Number 22 of 2016 concerning the standards of the basic and secondary education processes that assess aspects of knowledge are divided into 5 levels, namely Remembering, Understanding, Applying, Analyzing, and Evaluating.¹⁵ Based on that, there are two levels in the cognitive realm including the Higher Order Thinking Skill (HOTS). HOTS questions guide students to think high-level and connect with problems in daily life. Therefore, based on regulations the Minister of Education and Culture of the Republic of Indonesia number 54 of 2013, the national exam questions held in Indonesia must cover questions at the level of Higher Order Thinking Skill (HOTS) to create quality Human Resources that are capable of solving problems in daily life.

¹⁴ Peraturan Menteri Pendidikan dan Kebudayaan Republik Indonesia Nomor 54 Tahun 2013 Tentang Standar Kompetensi Lulusan Pendidikan Dasar dan Menengah, (May, 10, 2013), p. 1.

¹⁵ Lampiran Peraturan Menteri Pendidikan dan Kebudayaan Nomor 22 Tahun 2016, (June, 6, 2016), p. 3.

4. The Higher Order Thinking in Bloom's Taxonomy

One of the most well-known taxonomies from educational field is Bloom's taxonomy. Bloom's taxonomy focuses on six levels of thinking while learning or acquiring knowledge in students practice. In Bloom's Taxonomy itself contains three overlapping domains, there are cognitive, affective, and psychomotor domains.

Russel and Peter state that, the most commonly taught and assessed educational objectives are those in cognitive domain.¹⁶ It is in line with National Examinations where only cognitive domains are assessed and this study also focuses cognitive process of Bloom's Taxonomy. The following charts list is the types of cognitive process identified in Bloom's taxonomy.

¹⁶ Russell and Peter, *Classroom Assessment*, p. 68.

Table 2.1**The Types of Cognitive Process Identified in Bloom's Taxonomy¹⁷**

Taxonomy Level	Related Verbs	General Description
1. Knowledge	Remember, recall, identify, recognize	Memorizing facts
2. Comprehension	Translate, rephrase, restate, interpret, describe, explain	Explaining in one's own words
3. Application	Apply, execute, solve, implement	Solving new problems
4. Analysis	Break down, categorize, distinguish, compare	Breaking into parts and identifying relationship
5. Synthesis	Integrate, organize, relate, combine, construct, design	Combining elements into a whole
6. Evaluation	Judge, assess, value, appraise	Judging quality or worth

Based on Schraw *et al* as cited by Merta *et al* classifies Bloom's thinking skill into two categories that is Lower Order Thinking Skills which consists of knowledge, understanding and

¹⁷ Russell and Peter, *Classroom Assessment*, p. 69.

application. Higher Order Thinking Skills which consists of analysis, synthetic and evaluation.

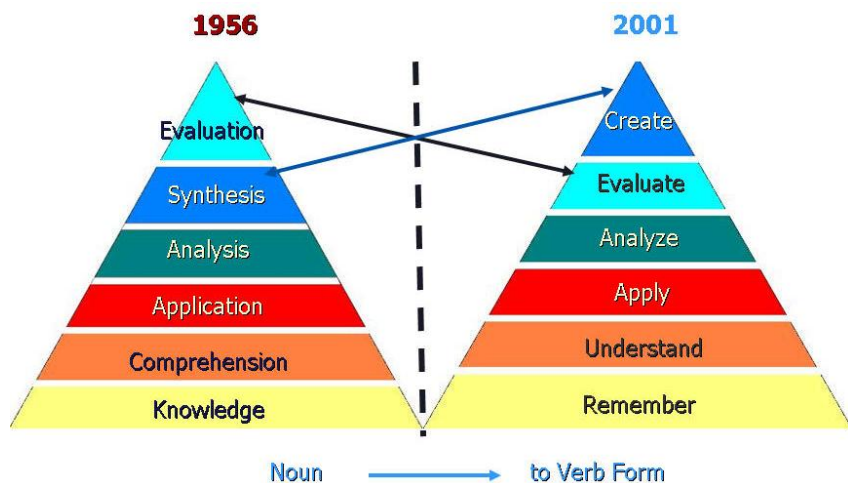
In 2001, David R. Krathwohl *et al* and his colleagues published an update version of Bloom's Taxonomy. In Blooms' taxonomy, there is only known one cognitive domain, but in Anderson and Krathwohl become two dimension. First dimension is Knowledge Dimension and Cognitive Process Dimension. The knowledge dimension means in learning toward more cognitive and constructivist perspectives emphasizes what learners know (knowledge) and how they think (cognitive processes) about what they know as they actively engage in meaningful learning, it consists of factual knowledge, conceptual knowledge, procedural knowledge, and metacognitive knowledge.¹⁸ Factual Knowledge – The basic elements students must know to be acquainted with a discipline or solve problems. Conceptual Knowledge – The interrelationships among the basic elements within a larger structure that enable them to function together. Procedural Knowledge – How to do something, methods of inquiry, and criteria for using skills, algorithms, techniques, and methods. Metacognitive Knowledge – Knowledge of cognition in general,

¹⁸ Anderson, Krathwohl, Airasian, Kathleen, *et al.*, *A Taxonomy*, p. 38.

as well as awareness and knowledge of one's own cognition.¹⁹ This revised taxonomy attempts to correct some of the problem with original taxonomy. The Cognitive Process Dimension of the revised Bloom's Taxonomy like the original version has six skills. They are from simplest to most complex: remember, understand, apply, analyze, evaluate, and create. Krathwohl *et al* interchange of the top two cognitive process categories, placing *Create* as the most complex category instead of *Evaluate*.²⁰ And those six skill cognitive process Bloom's taxonomy revision is the cognitive process dimension.

Table 2.2

Bloom vs. Anderson/Krathwohl²¹



¹⁹ Leslie Owen Wilson, "Anderson and Krathwohl Bloom's Taxonomy Revised, Understanding the New Version of Bloom's Taxonomy", (2016), p. 5.

²⁰ Lorin W. Anderson, David R. Krathwohl, Peter W. Airasian, Kathleen A. Cruikshank, *et al.*, *A Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives*, (New York: Longman, 2001), p. 268.

²¹ Leslie, "Anderson and Krathwohl, p. 4

In the revised Bloom's taxonomy, the cognitive process dimension is seen as a verb that functions to describe a particular process, while the noun that functions as an object of the process is carried out. One of the things that clearly differentiates the new model from that of the 1956 original is that it lays out components nicely so they can be considered and used. Cognitive processes, as related to chosen instructional tasks, can be easily documented and tracked. This feature has the potential to make teacher assessment, teacher self – assessment, and student assessment easier or clearer as usage patterns emerge. The writer uses descriptions and keywords in *bahasa*, because operational verbs are related in indicator of learning and making the blueprint. It also uses as analysis card to analyze the questions.

The following table is the description cognitive process dimension and operational verbs can be seen in table 2.3

Table 2.3
The Description Cognitive Process Dimension and
Operasional Verbs²²

No	Dimensi Proses Kognitif	Kata Kerja Operasional untuk
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²² Pusat Penelitian Pendidikan Balitbang Kemedikbud, *Panduan Penulisan Soal 2017* (Jakarta: Pusat Penelitian Pendidikan Balitbang Kemedikbud, 2017), p. 7

	dan Kategori	Perumusan Indikator/Tujuan
1	Mengingat (C1)	Pengertian: Mengambil pengetahuan dari memori jangka panjang
	1.1. Mengenali	menyebutkan, menunjukkan, memilih, mengidentifikasi
	1.2. Mengingat Kembali	mengungkapkan kembali, menuliskan kembali, menyebutkan kembali
2	Memahami (C2)	Pengertian: Mengkonstruksi makna dari materi pembelajaran, termasuk apa yang diucapkan, ditulis, dan digambar oleh guru
	2.1. Menafsirkan	menafsirkan, memparafrasekan, mengungkapkan dengan kata-kata sendiri, mencontohkan, memberi contoh, mengklasifikasikan, mengelompokkelompokkan, mengidentifikasi berdasarkan kategori tertentu, merangkum, meringkas, membuat ikhtisar, menyimpulkan, mengambil kesimpulan, membandingkan, membedakan, menjelaskan, menguraikan, mendeskripsikan, menuliskan
	2.2. Mencontohkan	mencontohkan, memberi contoh
	2.3. Mengklasifikasikan	mengklasifikasikan, mengelompokkelompokkan, mengidentifikasi berdasarkan kategori tertentu
	2.4. Merangkum	merangkum, meringkas, membuat ikhtisar
	2.5. Menyimpulkan	menyimpulkan, mengambil kesimpulan

	2.6. Membandingkan	membandingkan, membedakan
	2.7. Menjelaskan	menjelaskan, menguraikan, mendeskripsikan, menuliskan
3	Mengaplikasikan (C3)	Pengertian: Menerapkan atau menggunakan suatu prosedur dalam keadaan tertentu
	3.1. Mengeksekusi	menghitung, melakukan gerakan, menggerakkan, memperagakan sesuai prosedur/teknik, mengimplementasikan, menerapkan, menggunakan, memodifikasi, menstransfer
	3.2. Mengimplementasikan	mengimplementasikan, menerapkan, menggunakan, memodifikasi, menstransfer
4	Menganalisis (C4)	Pengertian: Memecah-mecah materi jadi bagian-bagian penyusunnya dan menentukan hubungan-hubungan antarbagian itu dan hubungan antara bagian-bagian tersebut dan keseluruhan struktur atau tujuan
	4.1. Membedakan	membedakan, menganalisis perbedaan, mengorganisasikan, membuat diagram, menunjukkan bukti, menghubungkan, menganalisis kesalahan, menganalisis kelebihan, menunjukkan sudut pandang
	4.2. Mengorganisasi	mengorganisasikan, membuat diagram, menunjukkan bukti, menghubungkan
	4.3. Mengatribusikan	menganalisis kesalahan, menganalisis kelebihan, menunjukkan sudut pandang

5	Mengevaluasi (C5)	Pengertian: Mengambil keputusan berdasarkan kriteria dan atau standar
	5.1. Memeriksa	memeriksa, menunjukkan kelebihan, menunjukkan kekurangan, membandingkan, menilai, mengkritik
	5.2. Mengkritik	menilai, mengkritik
6	Mencipta (C6)	Pengertian: Memadukan bagian-bagian untuk membentuk sesuatu yang baru dan koheren atau untuk membuat suatu produk yang orisinal
	6.1. Merumuskan	Merumuskan, merencanakan, merancang, mendisain, memproduksi, membuat
	6.2. Merencanakan	merencanakan, merancang, mendisain
	6.3. Memproduksi	memproduksi, membuat

According to this taxonomy, the higher order thinking skill in the revised edition of Bloom's Taxonomy or the top end skills there are analyze, evaluate, and create for students' critical thinking.

5. The Higher Order Thinking in Multiple Choice

The questions tested in the National Examination are objective tests in the form of multiple choices. A multiple-choice item consists of a stem, which presents the problem or question to the student, and a set of options, or choices, from which the

student selects an answer.²³ Which have several advantages as stated by William and Irvin, multiple-choice questions only measure factual recall, but they can also measure the student's ability to reason, to exercise judgment, and to express correctly and effectively, the degree of difficulty can be controlled by changing the degree of homogeneity of responses, etc.²⁴

Russel and Peter highlight that ...higher-order thinking skills can be measured by a multiple-choice item.²⁵ It means the multiple choice also can used to asses in higher level of thinking.

In summary, from the explanation above, the writer thinks that the higher order thinking in multiple choice can be used to assess higher-level thinking involving skills of application, analysis, and synthesis. Because this format only choose among all choices, so, the skill of create it is impossible in this test.

²³ Russell and Peter, *Classroom Assessment*, p. 146.

²⁴ William A. Mehrens and Irvin J. Lehmann, *Measurement and Evaluation in Education and Psychology*, (Belmont: Wadsworth/Thomson Learning, 1991), 4th Ed., p. 132.

²⁵ William and Irvin, *Measurement*, p. 65-66.