CHAPTER II
THEORETICAL REVIEW

A. Bloom’s Taxonomy

Benjamin Bloom in IACBE (2014-2016:1) along with a group of like-minded educators developed a framework for classifying educational goals and objectives into a hierarchical structure representing different forms and levels of learning. This framework was published as Bloom’s Taxonomy of Educational Objectives and consisted of the following three domains:

1. The Cognitive Domain: knowledge-based domain, consisting of six levels, encompassing intellectual or thinking skills
2. The Affective Domain: attitudinal-based domain, consisting of five levels, encompassing attitudes and values
3. The Psychomotor Domain: skills-based domain, consisting of six levels, encompassing physical skills or the performance of actions

According to Nafey et.al (2013: 2-3), by qualitatively expressing different types of thinking throughout the years, the levels have often been depicted as a stairway, leading many teachers to encourage their students to "climb to a higher (level of) thought". Krathwohl (2002:1) says the original taxonomy provided carefully developed definitions for each of the six major categories in the cognitive domain. The categories are knowledge, comprehension, application, analysis, synthesis, and evaluation.
Nafey et al. (2013:2) says Bloom’s Taxonomy outlines six hierarchical levels (Fig. 1) of cognitive complexity. Each category represents an increasingly complex type of cognition that is sometimes referred to as lower and higher levels of learning. Each taxonomy component builds on the successful completion of the previous levels.

![Figure 1: Design of Bloom’s Taxonomy](image)

Christi in Nafey (2013:3) says each classification within the hierarchy demanded the mastery of skills and abilities that were lower in the classification order. Progressing from lower-level skills (knowledge) to higher-level skills (evaluation), Bloom’s taxonomy presents cognitive development as the achievement of higher order abilities as the learner moves from knowledge to evaluation.

### B. Revised Bloom's Taxonomy (RBT)

According to Forehand (2010:2-3) during the 1990's, a former student of Bloom's, Lorin Anderson, led a new assembly which met for the purpose of updating the taxonomy, hoping to add relevance for 21st century students.
and teachers. This time "representatives of three groups [were present]: cognitive psychologists, curriculum theorists and instructional researchers, and testing and assessment specialists". Like the original group, they were also difficult and diligent in their pursuit of learning, spending six years to finalize their work. Published in 2001, the revision includes several seemingly minor yet actually quite significant changes. Several excellent sources are available which detail the revisions and reasons for the changes. The changes occur in three broad categories: terminology, structure and emphasis.

1. Terminology Changes

Changes in terminology between the two versions are perhaps the most obvious differences and can also cause the most confusion. Basically, Bloom’s six major categories were changed from noun to verb forms. Additionally, the lowest level of the original, knowledge was renamed and became remembering. Finally, comprehension and synthesis were rattled to understanding and evaluating. In an effort to minimize the confusion, comparison images appear below.
The new terms are defined as:

a. **Remembering**: Retrieving, recognizing, and recalling relevant knowledge from long-term memory.

b. **Understanding**: Constructing meaning from oral, written, and graphic messages through interpreting, exemplifying, classifying, summarizing, inferring, comparing, and explaining.

c. **Applying**: Carrying out or using a procedure through executing, or implementing.

d. **Analyzing**: Breaking material into constituent parts, determining how the parts relate to one another and to an overall structure or purpose through differentiating, organizing, and attributing.

e. **Evaluating**: Making judgments based on criteria and standards through checking and critiquing.

f. **Creating**: Putting elements together to form a coherent or functional whole; reorganizing elements into a new pattern or structure through generating, planning, or producing.

(Anderson & Krathwohl, in Forehand)

2. **Structural changes**

Structural changes seem dramatic at first, yet are quite logical when closely examined. Bloom's original cognitive taxonomy was one-dimensional form. With the addition of products, the Revised Bloom's Taxonomy takes the form of a two-dimensional. First, the knowledge dimension (or the kind of knowledge to be learned) composed of four levels those are defined as Factual, Conceptual, Procedural, and Meta-
Cognitive. Second, the cognitive process dimension (or the process used to learn) the cognitive process dimension consists of six levels that are defined as Remember, Understand, Apply, Analyze, Evaluate, and Create. Each of the four Knowledge Dimension levels is subdivided into either three or four categories (e.g. Factual is divided into Factual, Knowledge of Terminology, and Knowledge of Specific Details and Elements). The Cognitive Process Dimension levels are also subdivided with the number of sectors in each level ranging from a low of three to a high of eight categories. For example, Remember is subdivided into the three categories of Remember, Recognizing, and Recalling while the Understanding level is divided into eight separate categories.

The committee identified three domains of educational activities or learning (Bloom, et al. 1956) in:

a. Cognitive: mental skills (knowledge)

b. Affective: growth in feelings or emotional areas (attitude or self)

c. Psychomotor: manual or physical skills (skills)

3. Changes in Emphasis

Emphasis is the third and final category of changes. As noted earlier, Bloom himself recognized that the taxonomy was being "unexpectedly" used by countless groups never considered an audience for the original publication. The revised version of then taxonomy is intended for a much broader audience. Emphasis is placed upon its use as a "more authentic tool for curriculum planning, instructional delivery and assessment" (oz-Teacher Net, 2001 in Forehand).
C. Cognitive Levels in Bloom’s Taxonomy

There are six cognitive levels in revised bloom’s taxonomy. The revised taxonomy identifies the following new levels of cognitive learning arranged from lower-order to higher-order levels of learning. Those are:

1. **Remembering**: Retrieving, recognizing, and recalling relevant knowledge from long-term memory.

2. **Understanding**: Constructing meaning from oral, written, and graphic messages through interpreting, exemplifying, classifying, summarizing, inferring, comparing, and explaining.

3. **Applying**: Carrying out or using a procedure through executing, or implementing.

4. **Analyzing**: Breaking material into constituent parts, determining how the parts relate to one another and to an overall structure or purpose through differentiating, organizing, and attributing.

5. **Evaluating**: Making judgments based on criteria and standards through checking and critiquing.

6. **Creating**: Putting elements together to form a coherent or functional whole; reorganizing elements into a new pattern or structure through generating, planning, or producing.

(Anderson & Krathwohl, in Forehand)
D. Cognitive Levels in Indonesia’s Educational Objective

1. Basic of Educational Objectives in Indonesia

According to Education Minister Decree No 20/2003 about National Education System in article 1 point 1 in PERMENDIKBUD No 22 (2016:1) states that education is an aware effort and planned to create the atmosphere in teaching and learning process. Therefore the learners actively develop their potential to have spiritual power of religion, self-control, personality, intelligence, a good character, and the skills that they need like society, nation and state.

Standard process is a criterion of implementation learning in education units to increase SKL. Standard process is develop based on SKL and basic competence which is appropriate the education minister No. 32/ 20013 about the change of the education minister No. 19/ 2005 about standard education units.

Learning process in education unit are interactive, fun, signing, students’ motivation to be active, gives more enough space to become creative, independent, appropriate with their talent, interest and the development of physical & physiological of students. Every education units have plan, process and assessment of learning to increases the efficiency and the effectiveness of KL.

a. From the learners are told, to the learners to find out;

b. From the teachers as only one a source of learning becomes learning various in sources.
c. From textual approach becomes scientific approach.
d. From content based learning toward competences based learning.
e. Hard skills and soft skills are improved and balance.
f. Implementation of learning should be appropriate with the give exemplary (ing ngarso sung tulodo), build a view (ing madyo mangun karso), and the development of students’ creativity in the learning process (tut wuri handayani).
g. Utilization of technology information and communication to improve the efficiency and the effectiveness of learning

The characteristics of learning in each education unit related with Standard Competence and Basic Competence. Standard Competence gives conceptual framework about learning objectives that should be achieved. Basic Competence gives conceptual framework about learning activities which is related with competences and subjects matter. In KL there are three domain of learning objectives such as cognitive domain, affective domain and psychomotor domain. The third domains that have been mentioned have different acquisition. First, the cognitive domain obtained through activities remembering, understanding, applying, analyzing, evaluating and creating. Second, the affective domains obtained through activities accept, run, respect, live, and practice. Third, psychomotor domain obtained through activities observing, asking, trying, reasoning, tasting, and creating.
The characteristic of competences and the different acquisition is the impact characteristic of standard process. First, to strengthen scientific, thematic between the lessons, thematic in one lesson it is necessary for applying discovery learning or inquiry learning. Second, to encourage the students’ ability to product the individual or group creation it is recommended to use project based learning.

Table 2.1
The details of attitude, knowledge, and skills:

<table>
<thead>
<tr>
<th>Attitude</th>
<th>Knowledge</th>
<th>Skill</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receiving</td>
<td>Remembering</td>
<td>Observing</td>
</tr>
<tr>
<td>Run</td>
<td>Understanding</td>
<td>Questioning</td>
</tr>
<tr>
<td>Appreciate</td>
<td>Applying</td>
<td>Trying</td>
</tr>
<tr>
<td>Live</td>
<td>Analyzing</td>
<td>Reasoning</td>
</tr>
<tr>
<td>Practice</td>
<td>Evaluating</td>
<td>Decorating</td>
</tr>
<tr>
<td></td>
<td>Creating</td>
<td>Creating</td>
</tr>
</tbody>
</table>

2. Sample Verbs of Cognitive Levels in Indonesia

Table 2.2
Levels Cognitive Revised

<table>
<thead>
<tr>
<th>No</th>
<th>Categories</th>
<th>Explanation</th>
<th>Sample Verbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Remembering</td>
<td>The ability of students to remember the information/knowledge which is saving in their mind.</td>
<td>Define, list, explain, remember, recognize, duplicate, identify, recall, tell, and name.</td>
</tr>
<tr>
<td>2</td>
<td>Understanding</td>
<td>The ability of students to understand the</td>
<td>Explain, calculate, categorize, clarify,</td>
</tr>
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<td></td>
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<td></td>
<td>instruction and the concept either in the form of oral, written, or diagrams.</td>
<td>classify, compare, conclude, contrast, describe, discuss, distinguish, exemplify, expand, explain, illustrate, infer, interpret, locate, match, paraphrase, predict, report, restate, summarize</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Applying</td>
<td>The ability to apply the concept in certain situations.</td>
<td>Classify, choose, apply, execute, use, demonstrate, utilize, carry on, implement, describe, illustrate, solve, practice.</td>
</tr>
<tr>
<td>4</td>
<td>Analyzing</td>
<td>The ability to think logically</td>
<td>Compare, contrast, attribute, deconstruct, detect, differentiate, discriminate, formulate, infer, integrate, organize, parse, sequence, structure and test.</td>
</tr>
<tr>
<td>5</td>
<td>Evaluating</td>
<td>The ability of students to evaluate.</td>
<td>Appraise, check, coordinate, critique, defend, detect, dispute, judge, monitor, support and verify.</td>
</tr>
<tr>
<td>6</td>
<td>Creating</td>
<td>The ability of students to create.</td>
<td>Change, combine, compile, compose, construct, create, design, formulate, improve, plan,</td>
</tr>
</tbody>
</table>

Investigation The Cognitive..., Sri Musyhofah, FKIP UMP 2017
The cognitive levels in Indonesia’s educational objectives based on revised bloom’s taxonomy

(UTARI, 9)

PERMENDIKBUD, 2013