
THE IMPLEMENTATION OF BLOOM'S TAXONOMY IN THE ASSESSMENT INSTRUMENT FOR ECONOMICS LEARNING TO IMPROVE THE STUDENTS' COGNITIVE COMPETENCIES

Dini Octoria^a, Sudiyanto^b, Sri Witurachmi^c, Dewi Kusuma Wardani^d

^aAccounting Education Department, Faculty of Teacher Training and Education, Sebelas Maret University, Surakarta, Indonesia

^bAccounting Education Department, Faculty of Teacher Training and Education, Sebelas Maret University, Surakarta, Indonesia

^cAccounting Education Department, Faculty of Teacher Training and Education, Sebelas Maret University, Surakarta, Indonesia

^dEconomic Education Department, Faculty of Teacher Training and Education, Sebelas Maret University, Surakarta, Indonesia

Corresponding e-mail: viva_dini_ku@yahoo.com

ABSTRACT

The objective of this research is to improve the students' cognitive competencies through the implementation of Bloom's taxonomy in the assessment instrument for Economics learning. It used the classroom action research with one cycle. The cycle consisted of four phases, namely: planning, implementation, observation, and reflection. The subjects of research were 26 students in Grade XII-A of Social Science Program of State Senior Secondary School 1 of Surakarta. The object of research was the assessment instrument for Economics learning which had implemented the Bloom's taxonomy. The data of research were quantitative and qualitative ones, which had been obtained from the students, teacher, and documents. They were collected through test, observation, and documentation. The test was to investigate the students' cognitive competencies; the observation was to observe the implementation of the Bloom's taxonomy in the assessment instrument for Economics learning; and the documentation was to record the relevant pieces of information during the research. The feasibility and validity of the research instrument were tested by using the content validity and the Cronbach's Alpha formula respectively. The quantitative data were analyzed by using the statistical and descriptive analysis, and the qualitative ones were analyzed by using the systematic and structured model of analysis. The students' cognitive competencies were said to be increased if the final score achieved was at least 85 in the Economics learning, and at least 85% of the students already gained the aforementioned increase in their cognitive competencies. The result of research shows that prior to the treatment, 67% of the students still had the final score of less than 85. Following the treatment in one cycle, 88% of the students then gained the score of at least 85. Thus, the implementation of Bloom's taxonomy in the assessment instrument for the Economics learning could improve the students' cognitive competencies.

Keywords : Bloom's taxonomy, assessment instrument, students' cognitive competencies

INTRODUCTION

In this globalization era, education has rapidly been developing. Disclosure of information technology has made it easier for every country to innovate in the field of education. As the country with the largest population in ASEAN, Indonesia should be able to provide human resources with competencies to compete amid the ongoing ASEAN Economic Community as of 2015. Therefore the Indonesian Government through the Ministry of Education and Culture continues to make efforts to realize the provision of quality education. The legal basis for the provision of education in Indonesia is Paragraph 3 of Article 31 of Chapter XIII of the fourth amended 1945 Constitution of the Republic of Indonesia, which states that the government shall provide a national education with a system that enhances faith and piety and good character in order to enrich the nation life, which is set in legislation.

Furthermore, in Law Number: 20 of 2013 concerning National Education System, it has clearly been set up that Indonesian education is provided in three levels of education, namely primary education, secondary education and higher education. Primary education in Indonesia is a basic learning for students, which is undergone for 9 years in the forms of primary school and junior secondary school or other equivalent forms. Secondary education in Indonesia is a continuation of primary education consisting of Senior Secondary School and Vocational High School. The main focus of the former is to provide educational services in the form of basic knowledge and skills for its students to go on to a higher education, whereas the latter is focused on education services in the form of knowledge and basic skills to start work in accordance with the main skills. Higher education in Indonesia is a continuation of secondary education which includes diploma's, bachelor's, master's, specialist, and doctoral degrees.

Secondary education has a role which is no less important than the other levels in providing Indonesian human resources. In the condition of having the demographic bonus, the productive age population in Indonesia from 2020 to 2035 will be abundant. Consequently, there must be quality secondary education that provides competent human resources of productive ages. Along with advancement in technology and the demands of society, Senior Secondary Schools in Indonesia continue to make innovations in learning.

Teachers and students can easily access sources of knowledge from printed and online media. Today Electronic Books by a wide variety of abroad authors and publishers can already be accessed and enjoyed through the teachers' and students' gadgets. In addition, the learning process would no longer be carried out conventionally where students come, sit and listen to the teachers delivering the material. Nowadays the learning process uses a variety of innovative learning models such as problem-based learning, cooperative learning, discovery learning, blended learning and others. Progress in the using of innovative learning resources and models has, in fact, not been accompanied by the teachers' ability in the use of assessment instruments which correspond to the students learning activities.

During the pre-study observations in visit to students of field experiences in schools program, it was found that most of the teachers of Senior Secondary Schools of Surakarta still used the conventional assessment instruments. They were the same as the ones used in the previous learning period. The teachers only did some editorial revisions in word usage and assessment identity. Notes from pre-study interviews on the forum of Subject Teachers' Council (MGMPs) for Senior Secondary Schools show that that most teachers did not have enough knowledge on the concept of learning assessments. The condition is of course not in accordance with the innovative learning implemented by the teachers. The teachers must absolutely have enough knowledge on the concept of learning assessments. When making a lesson plan, the teachers should be able to adapt the topics to learning models, learning resources and assessment instruments used in the teaching and learning process. Thus, the learning is expected to improve the students' competencies.

As one of the subjects that are taught at Senior Secondary Schools especially in Social Science (IIS) Program in Grades X, XI, and XII, Economics requires certain assessment instruments suitable to the characteristics of the subjects. As for Grade XII, the Economics material contains learning material of Accounting such as accounting as an information system, the basic equation of accounting, construction of accounting cycles in service companies, and construction of accounting cycle in goods companies. Economics learning on Accounting is generally carried out by using innovative learning models that emphasize on students' involvement.

The results of observations conducted in Grade XII-A of Social Science program at State Senior Secondary School 1 of Surakarta show that Economics learning had already implemented cooperative learning model in Economics especially in accounting class. This innovative learning model implementation had not been accompanied by the use of the assessment instruments suitable to characteristics of the accounting material. The Economics learning used the assessment instruments in the form of similar tests year after year with a few changes in company names, dates and nominal values of financial transactions. Such condition caused problems in the achievement of students' especially in cognitive competencies in Economics.

The first problem was the use of an essay test which was not accompanied by the blueprint would produce invalid test results and would ultimately not be able to achieve the objectives of the test. The students would work on accounting cases like robots that could quickly record and make calculations in any column and any other form regardless of the accounting concepts underlying the construction of the accounting case. The second problem was that the students had already known the assessment patterns the teacher used. With today's advancement in technology, the use of the same assessment instruments year after will make it easier for the students to obtain relevant information on the test of same grade in the previous year. The third problem was the low level of students' cognitive competencies in Economics, especially in Accounting. It was due to the different forms of the tests used during the learning at school with the National Examination (UN). In Accounting class, assessment instruments used by the economics teachers for Grade XII of Social Science Program was an essay test while the UN used multiple choice form. If the students had good competencies in Accounting material, they would not have any difficulty to face different types of tests. The pre-action data show that based on the cognitive test results in Accounting of the students in Grade XII of Social Science Program, 67% of the students still did not achieve the score of 85.

Thus, the main problem is the use of conventional assessment instruments in Economics in Grade XII of Social Science Program at State Senior Secondary School 1 of Surakarta. It is, therefore, necessary to do research entitled, "Implementation of Bloom's Taxonomy in the Economics Assessment Instruments to Enhance Students' Cognitive Competencies."

MATERIALS and METHODS

Assessment and learning is a unity integrated from the beginning to the end of the learning process. Assessment is a process of collecting and working information to determine the students' achievement in the learning process. Nitko Dan Brookhart (2007: 14), argue "assessment is a process for obtaining information that is used to make decisions about students, curricula and programs, and educational policy." This definition includes obtaining information not only information on students' condition during and following the learning but also information useful for the improvement in Education curriculum and policy.

Assessment is often considered to be the same as test and measurement. Linn and Gronlund (2000: 32) describe it further as follows:

Assessment: any variety of procedures used to obtain information about student performance, including traditional paper and pencil tests as well as extended responses (e.g. essays) and performances of authentic tasks (e.g. laboratory experiments).

Test: an instrument or systematic procedure for measuring a sample of behavior by posing a set of question in a uniform manner.

Measurement: the process of obtaining a numerical description of the degree to which an individual possesses a particular characteristic.

From such terminologies, it can be seen that assessment has a broader concept of test and measurement. Assessment contains a wide variety of activities to determine the students' performance through a test or a non-test to the students. To obtain information according to orders and levels, measurement of test and non-test should be done. Thus, test and measurement are activities that are included in assessment.

Learning assessment aims at determining the student's learning outcomes that can be classified into three domains as proposed by Bloom. The Bloom's Taxonomy, introduced by Benjamin S Bloom, is a classification of the three domains of learning, namely: cognitive, affective, and psychomotor domains. Cognitive domain refers to how students acquire, proceed and use knowledge. Affective domain refers to students' behavior and attitude toward a subject, which are reflected in their behavior during the learning process. Psychomotor domain refers to students' skills during the learning process. Economics learning is expected to make changes in the students' behavior within all three domains. Referring to the problems and characteristics of Economics, especially on Accounting, this study is focused on the cognitive domain because

Accounting material requires knowledge, understanding and accounting concepts implementation.

Furthermore Bloom in Budiyono (2015: 84) classifies cognitive domain into six hierarchies as follows: 1) Knowledge; 2) Comprehension; 3) Application; 4) Analysis; 5) Synthesis; 6) Evaluation. Each hierarchy is also known as C1, C2, C3, C4, C5, C6 which stand for cognitive. Knowledge contains memory on material that has been learned and is reflected in the students' ability to recall it. Comprehension contains knowledge or understanding on particular concept or theory, which is reflected in students' ability to analogize one piece of information to another one. Application is an implementation of concepts that have been learned and the realization of this cognitive domain is that the students are able to implement the knowledge they have learned. Analysis is the description of the concept that the students have learned, which is reflected in their ability to describe concepts and to find the relation between them. Synthesis is the students' ability to build new knowledge on materials they have learned. Evaluation is the students' knowledge embodied in making criteria, consideration and assessment of the concepts they have learned.

In the implementation, assessment should use assessment techniques suitable to the competencies of the students to be assessed. Nitko and Brookhart (2007: 14) explain that, "assessment techniques include paper and pencil tests; formal and informal observation: homework, exercises, and research papers; projects and exhibits; performances; portfolio; oral questioning; and analysis of students record." The theory specifically classifies assessment techniques into tests; formal and informal observations: homework, exercises, and papers; projects and exhibitions; performance; portfolio; oral questions; and the analysis results of students' records.

Economics teachers must have proficiency in combining the Bloom's Taxonomy knowledge with assessment techniques to be used. With the characteristics of Accounting material, which contains concepts and calculations as well as the settlement of the case, it is considered appropriate to use test assessment technique. Djemari Mardapi (2012: 108) classifies tests into two forms, namely: objective and non-objective tests. The former can be in the forms of multiple choices, true-false, matching and objective description whereas the latter tests can be in the form of narrative. Each test form has its advantages and disadvantages, and therefore it is necessary to consider the

characteristics of the subject. However, the use of assessment instrument in the form of the test will result in the same information if the tests are well designed. The tests that used in this study were non-objective tests in the forms of narrative tests.

One important step in designing a test is constructing a blueprint table. Blueprint table serves as a guide for the teachers to develop question items. The Economics teachers of the students in Grade XII of Social Science Program of State Senior Secondary School 1 of Surakarta never constructed blueprints when designing the tests. This resulted in their low cognitive competencies. There is no fixed rule in constructing a blueprint table but, at least, it should contain information on learning identity, indicators to be assessed along with details of thinking levels of thinking according to the Bloom's Taxonomy. Here is an example of an assessment instrument blueprint table form:

Table 1. Assessment instrument Blueprint

Subject Matter	:
Academic year/Semester	:
Time of Test	:
Core competencies	:
Basic competencies	:

NO.	LEARNING INDICATORS	COGNITIVE DOMAIN OF BLOOM'S TAXONOMY				QUESTION ITEMS
		C1	C2	C3	C4	

By constructing a blueprint table, the teachers are expected to understand that a well prepared test will lead to good cognitive competencies of students. In constructing the Economics learning assessment instruments, this study was focused on the implementation of the Bloom's Taxonomy from C1 to C4.

This study used the classroom action research with two cycles. It was conducted at State Senior Secondary School 1 of Surakarta, and it was planned to last for 3 months. The subjects of research were 26 students in Grade XII of Social Science Program of the school. The objects of research were assessment instruments of Economics learning which implemented the Bloom's Taxonomy.

The data were in the forms of quantitative and qualitative ones. The sources of the data were students, teachers, and documents. They were collected through tests, observations, and documentations. The tests were to determine students' cognitive competencies; the observations were to investigate the implementation of the Taxonomy in the assessment instruments in the Economics learning; and the documentations were to record relevant pieces of information during the study. The feasibility of the research instruments was tested by using the content validity, and their reliability was tested by using the Cronbach's alpha formula. The quantitative data of research were analyzed by using the descriptive statistics whereas the qualitative ones were analyzed systematically and structurally. The students' cognitive competencies were judged to improve if the students achieved the final score of at least 85 in the Economics learning and At least 85% of them had experienced the improvement in cognitive competencies.

For each cycle, the procedure of implementation action was divided into four phases: action planning, action execution, observation and reflection. At the action planning stage, the activity was providing knowledge of the Bloom's Taxonomy for Economics teachers. The next stage was action execution. At this stage the teachers designed assessment instruments for Economics learning by implementing the Bloom's Taxonomy knowledge, which can be broken down into the following activities:

1. Teachers determined the identity of learning.
2. Teachers determined the cognitive levels of Bloom's Taxonomy to be used.
3. Teachers developed indicators into question items.

At the observation stage, the process of doing the written narrative tests by the students was observed Finally, in the reflection stage, the implementation of the Bloom's Taxonomy in the assessment instruments in the Economics learning which was done by the students was analyzed. When the result of the first cycle reached the performance indicators set in advance, the action execution was considered to be successful.

RESULTS

Based on the implementation of the Bloom's taxonomy on assessment instruments of the Economics learning at Grade XII of Social Science of Senior Secondary School 1 of Surakarta, execution action at the first cycle improved the students' cognitive competencies as shown in the following figure:

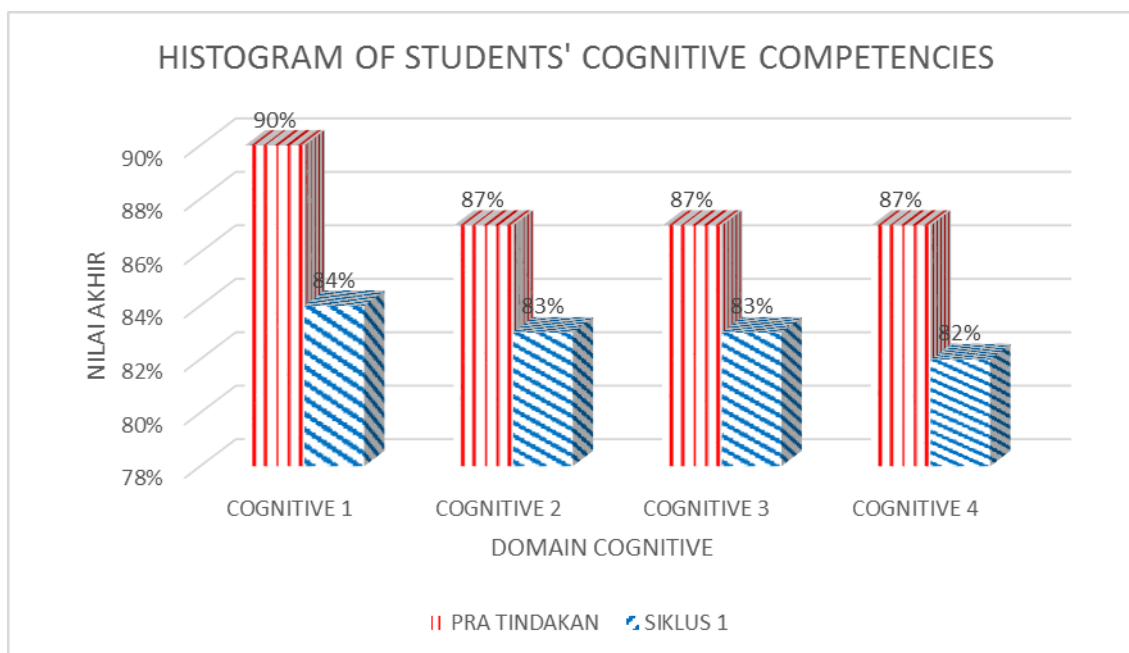


Figure 1. Histogram of Students' Cognitive Competencies

Figure 1 shows that the implementation of the Bloom's Taxonomy in the assessment instruments of the Economics learning improved the students' cognitive competencies. The Pre-action data show that the final score of the students in Cognitive 1 was 84%, in Cognitive 2 was 83%, in Cognitive 3 was 83%, and in Cognitive 4 was 82%. 9 students still gained the final score of less than 85. Therefore, there were only 17 students or 67% who had the final score of more than 85. The average final score of the students' cognitive competencies during pre action was 83.06.

Data of the first cycle show that the final score of the students in Cognitive 1 was 90%, in Cognitive 2 was 87%, in Cognitive 3 was 87%, and in Cognitive 4 was 87%. There were only three students who gained the final score of less than 85 whereas 23 students or 88% gained the final score of more than 85. The average final score of the students' cognitive competencies in the action cycle 1 was 87.87. Thus, the

implementation of Bloom's Taxonomy in the assessment instruments in the Economics learning was able to improve the students' cognitive competencies.

DISCUSSIONS

The results of research show that that the implementation of the Bloom's Taxonomy on the assessment instruments in the Economics learning could enhance students' cognitive competencies. The improvement of the students' competencies happened because the assessment instruments in the form of written test in narrative form had been well prepared according to the procedure. There were significant differences of action prior to and during the action executed to the Economics teachers. Before the action was done, the teachers used the same assessment instruments in the form of written tests in narrative time after time. Yet, the instruments were not developed through the test preparation procedures. In preparing the tests, the teachers only estimated the time of the tests and the materials to be tested, so that the preparation of the tests on Economics for the students in Grade XII of Social Science Program at State Senior Secondary School 1 of Surakarta was done without paying attention to aspects of cognitive levels of the Bloom's Taxonomy.

The execution action in cycle 1 began with action planning. At this stage, the teachers were given the knowledge of the Bloom's Taxonomy in the form of introductions to each level consisting of knowledge; comprehension; implementation; analysis; synthesis; evaluation. The Economics teachers should be able to identify any material with its cognitive level. For instance, in the teaching materials on constructing a financial report, the teachers must be able to identify the cognitive level required for the material. In order to construct a financial report of service company with a good level of competencies, the students need knowledge; comprehension; implementation; and analysis on such material, and therefore the designed assessment instruments should contain those four cognitive levels.

The second stage of the class action was action execution. At this stage the Bloom's Taxonomy on the assessment instruments in the Economics learning was implemented. Activities undertaken by the teachers as to be able to implement such knowledge were determining the identity of learning, determining the cognitive levels of the Bloom's Taxonomy to be used in the blue print table, and then developing indicators

into question items. The final output of the action execution stage was the assessment instrument blueprint and the written test in narrative form.

The third stage was the observation. At this stage the teachers observed the students' activities in doing the written test in narrative form. Based on the observations, the students felt comfortable and had no difficulties in taking the test. It was proved when the students were fully concentrated in taking the test and showed no suspicious activities. The test results described in study indicate that the students experienced the improved cognitive competencies as shown in Figure 1.

The last stage of the class action was reflection. At this stage the teachers analyzed the implementation of the Bloom's Taxonomy on the assessment instruments in the Economics learning to improve the next assessment tools. Referring to the performance indicators having previously been determined, the students' cognitive competencies were considered to improve if they achieved the final score of at least 85 in the Economics learning, and there were least 85% of students who gained improvement in their cognitive competencies, the class action study could already be terminated in cycle 1 because the performance indicators was achieved. The result of the study show that the average final score of the students in the Economics learning in cycle 1 was 87.87 and there were 87% of students who achieved the final score of more than 85.

CONCLUSIONS

Based on the explanation and the discussion above, a conclusion is drawn that the implementation of Bloom's Taxonomy in the assessment instruments in the Economics learning was proved to improve students' cognitive competencies.

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