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The Development of Assessment Instruments in Improving Analysis Thinking Ability

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Abstract

This study aims to improve analytical thinking skills and student accounting learning outcomes through the development of assessment instruments. The object of this research is journal material. This research is a development research that develops an assessment instrument adopting the Thiagarajan development model. Data collection techniques with tests and observations. The data analysis technique of this research is descriptive qualitative analysis technique. The assessment instrument designed was tested for validity and reliability. The test instrument test that is designed is valid and feasible to use and the Test Reliability test is declared reliable. The ability to think in analyzing students through journals can be categorized as low, this can be seen from the average score of 37.66.

Keywords
analyzing thinking; learning outcomes; assessment instrument

I. Introduction

The research aims to analyze how the development of assessment instruments in improving students' analytical thinking skills. Learning conducted online during a pandemic is generally full of problems for both lecturers and students due to sudden changes in learning methods without proper preparation, from face-to-face learning to online learning. research conducted by Asmuni (2020) states that the implementation of online learning which is distance learning during the COVID-19 pandemic has various problems experienced by teachers, students, and parents. Problems from teachers are in the form of weak IT mastery and limited access to student supervision. The learning carried out can be said to be not optimal considering the role of the teacher is only as a transfer of knowledge.

Learning objectives are targets to be achieved by students. there are three kinds of aspects that are the target of the learning objectives, namely cognitive aspects, affective aspects and psychomotor aspects. According to Sujana in Tri Indra Prasetya (2012), the cognitive domain (cognitive domain) is a domain related to intellectual learning outcomes which includes six aspects, namely: knowledge or memory, understanding, application, analysis, synthesis and evaluation. The first two aspects are called low-level cognitive and the next four aspects include high-level cognitive. while the affective aspect according to Arifin (2012) Affective domain (affective domain), namely the internalization of attitudes that point towards inner growth and occurs when students become aware of the values received, then take an attitude so that it becomes part of itself in forming values and determining behavior. Psychomotor domain (psychomotor domain), namely the ability of students related to body movements or parts therefore, ranging from simple movements to complex movements, Changes in movement patterns take at least 30 minutes.

The learning that is carried out should be able to bring students into the real world, so that the knowledge possessed by students can be applied in the world of work and the real world with a good attitude, so that the three aspects of learning objectives become a unified

whole in learning. The learning objectives are stated right on target, it can be known by the assessment of learning outcomes. Assessment of learning outcomes is an act of teachers to evaluate students which is done in writing or orally. The value obtained by students becomes a reference to see students' mastery in receiving the subject matter whether the material presented has been able to meet the learning objectives. Teachers must carry out learning assessments as one of the teacher's tasks, namely assessing learning outcomes.

Law Number 20 of 2003 Article 39 paragraph 2 concerning the National Education System states that educators are professionals who are tasked with planning and implementing the learning process, assessing learning outcomes, conducting guidance and training, as well as conducting research and community service, especially for educators at College. One of the competencies that must be possessed by an educator is the ability to conduct assessments, both assessments in the learning process and assessment of learning outcomes. Assessment serves to measure the achievement of an activity in this case is a teaching and learning activity.

Assessment of learning can be carried out at the beginning of the process, during the process and at the end of the learning process. all of which cannot be separated from the learning objectives, the learning materials delivered and how to deliver the material so that the objectives can be achieved. According to Rahmawati (2014) "Assessment is a series of activities to obtain, analyze, and interpret data about learning processes and outcomes that are carried out systematically and continuously so that they become meaningful information in decision making". Assessment is carried out not only at the end of the lesson but starting from the lesson plan, the learning process and until the end of the lesson. The learning process is an integrated system and cannot be separated between the stages carried out by the teacher in the classroom until the end of the lesson. Furthermore, Anurrahman 2013 states that specifically in the context of classroom learning, assessments are carried out to determine the progress and learning outcomes of students, diagnose learning difficulties, provide feedback/improvement of the teaching and learning process, and determine grade promotion through assessments to obtain accurate information about the implementation of learning itself.

The development of an assessment instrument can be said to be a step taken to obtain an assessment tool that can measure the indicators of the goals to be achieved in the learning process. Learning is now more emphasis on 21st century learning with the 4.0 revolution. Learning demands in revolution 4.0 with 4C competencies: 1) Critical Thinking and Problem Solving, 2) Communication Skills, 3) Collaboration Skills, 4) Creativity Skills and Innovation. These four competencies are not something that is easy to achieve. Achievement of the four competencies can be done through HOTs-based learning outcomes assessment. The Director General of GTK (2018) stated that the Government expects students to achieve various competencies by applying HOTS or Higher-Level Thinking Skills. These competencies are critical thinking (critical thinking), creative and innovative creative and innovative, communication skills (communication skills), the ability to work together (collaboration) and confidence (confidence). Research conducted by Puspaningtyas, in Hasna (2019) that HOTS is very necessary in the current era of globalization. Students are no longer guided and told about solving a problem, but find out for themselves. It takes higher order thinking skills to solve something difficult. According to Hasna (2019) HOTS is a way of thinking that not only memorizes, but also analyzes, manipulates information, and draws conclusions towards the creation of creative ideas. In this study, using higher order thinking skills C4 and C5, namely analyzing and evaluating. According to Uno (2014) that the cognitive area is an area that discusses learning objectives with regard to mental processes that start from the level of knowledge to a higher level, namely evaluation.

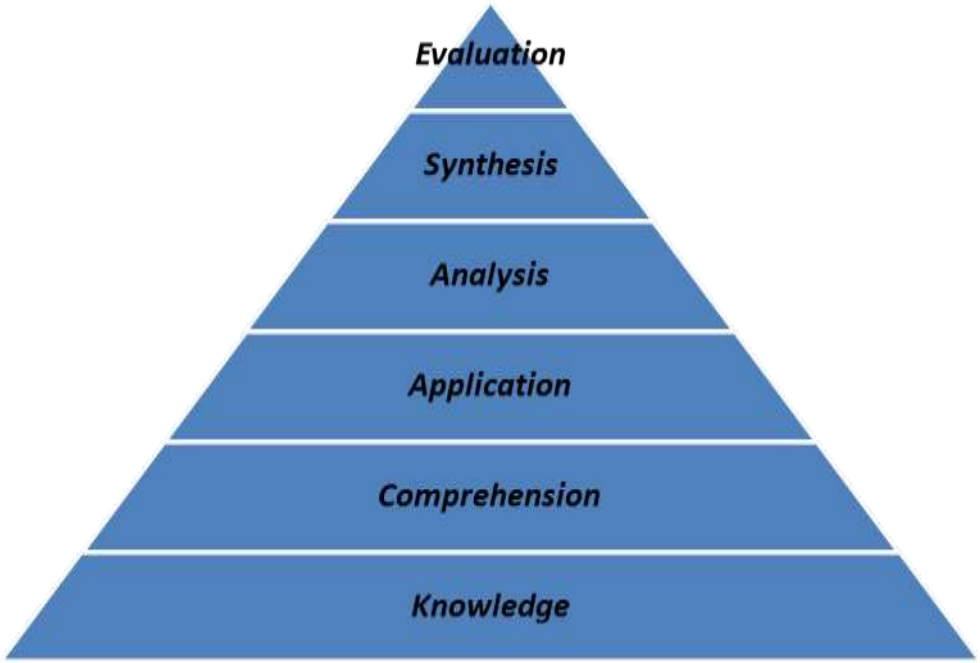

Figure 1. *Bloom's Cognitive Taxonomy (Retno, 2011)*

Figure 1. explains that knowledge (Knwoledge), Understanding (Comprehension), Application (Application) are the abilities that are expected at a low level and Analysis (Analysis), Synthesis (Synthesis), Evaluation (Evaluation) are at a high level ability. This study will discuss the assessment of the cognitive aspect.

II. Review of Literature

2.1 HOTs. Indicator

In Eka Fitriani (2019) According to Krathwohl in A revision of Bloom's Taxonomy: an overview Theory Into Practice states that indicators to measure higher order thinking skills include:

a. Analyze

Simanjuntak (2011) states that the ability to analyze can be interpreted as an individual's ability to determine the parts of a problem and show the relationship between these parts, see the causes of an event or give arguments that support a statement. Dan Rokhman (2018) states Analyzing is a process that involves parts and structures of thinking as a whole to solve problems. Analyzing includes the cognitive processes of attributing, distinguishing, and organizing. There are three indicators in the ability to analyze, namely:

1) Analyze incoming information and divide or structure the information into smaller parts to identify patterns or relationships
2) Able to recognize and distinguish the causes and effects of a complex scenario.
3) Identify/formulate questions

b. Evaluate

1) Provide an assessment of solutions, ideas, and methodologies by using suitable criteria or existing standards to ascertain the value of their effectiveness or benefits.
2) Create hypotheses, critique and conduct testing.
3) Accept or reject a statement based on predetermined criteria

c. Create

1) Make generalizations of an idea or perspective on something.
2) Design a way to solve the problem.
3) Organizing elements or parts into a new structure that has never existed before

According to Hasna Alfasina (2019) that HOTS is needed for accounting learning in schools, in general and in vocational schools in particular. This is because vocational students majoring in accounting are expected to work in the accounting and finance fields. Muhamad & Sulaiman (2013) suggested that professional accountants need to develop a skill paradigm, one of which is how to think.

Based on a survey conducted by Nugroho (2018), it was found that most students are still at a low-level thinking ability where students are able to work on questions for which there is complete information and can be answered immediately without the student having to make conclusions like problems that require higher-level thinking skills high (HOTS). The results of Purba's research (2019) stated that students' skills in doingthe development of questions with HOTs standards is still low compared to the ability to compose questions with the LOTS category. Research result Sukarni (2019) states that Inviting students to think at a higher level is in the difficult category and difficulties of the Economics Accounting teacher in measuring ability based on HOTS fall into the very difficult category. This condition shows the importance of developing assessment instruments to improve higher-order thinking skills and to improve learning outcomes.

2.2 Assessment Instrument

The learning carried out has a purpose, namely to achieve Basic Competence, Competency Achievement Indicators and learning objectives that are set beforehand. To measure the achievement of the Competency Achievement indicators and learning objectives, an instrument called an assessment instrument is used.Bastaman (2016) stated that the ability of teachers to develop test instruments certainly affects student learning outcomes. With an assessment test instrument that meets the criteria, of course, student learning outcomes will be detected properly and can be used as evaluation material for the learning program. Furthermore, the assessment instrument prepared must be able to represent the learning material as a whole and be able to answer the problems in the subject matter presented. RI Law Number 14 of 2005 concerning Teachers and Lecturers (2006: 167-168) explains that educational assessment standards are national education standards relating to mechanisms, procedures, and instruments for assessing student learning outcomes.

Assessment is the process of collecting and processing information to measure the achievement of student learning outcomes. Ella Yulaelawati, (2004) states that in education there are two meanings for assessment, namely assessment in the sense of evaluation (evaluation) and assessment in the sense of assessment (assessment). Assessment in the sense of evaluation is an assessment of the education program as a whole, educational evaluation examines the interrelated components of planning, implementation, and monitoring in education. Meanwhile, assessment in the sense of assessment is part of the evaluation, which is an assessment of some components in education, concerning the assessment of learning outcomes related to the components of graduate competence.

The assessment instrument referred to in this study is a test. Tests are generally used to measure the level of knowledge and skills of students. There are generally two kinds of tests to measure cognitive abilities, namely descriptive tests and objective tests. According to Sudjana (2016) the description test consists of free descriptions, limited descriptions and structured descriptions. While the objective test consists of several forms, namely the form of

true and false choice, multiple choice with various variations, matchmaking and short or complete entries.

The assessment instrument in its preparation is first determined by the question grid. The grid generally contains indicators of achievement of competence, / learning objectives, level of difficulty of questions, subject matter, number of questions, number of questions and assessment criteria. The next step is to design the instrument, based on the grid that is arranged. The design of the assessment instrument is adjusted to the type of test. The next step is the validity and reliability of the assessment instrument. According to Arikunto (2013: 211) states that validity is a measure that shows the levels of validity or validity of an instrument. A valid or valid instrument has high validity. On the other hand, an instrument that is less valid means it has low validity. Winarno (2011: 106) states that instrument validity is more precisely defined as the degree of closeness of the measurement results to the actual situation (truth), not a matter of being completely right or completely wrong. Test reliability is the level of constancy (consistency) of a test, namely the extent to which a test can be trusted to produce a score that is relatively unchanged even though it is tested in different situations. A good test reliability indicates that the test is appropriate for measuring thinking ability or in accordance with what will be measured that is, the extent to which a test can be trusted to produce a score that is relatively unchanged even though it is tested in different situations.

III. Research Methods

This research is a development research that adopts the Thiagarajan development model. The procedure is carried out through four stages, namely: (1) Define Phase, (2) Design Phase, (3) Development Phase and (4) Expansion Phase carried out in this study only reached the third stage. The research sample is 5th semester students of Accounting Education Study Program, FKIP Muhammadiyah University, North Sumatra

Data collection techniques were carried out using tests and questionnaires. The test is used to measure students' thinking skills in analyzing while the questionnaire is to get an overview of the tests that are arranged whether they are valid and reliable in meeting the criteria for the Hots test. Indicators in measuring the instrument's validity include: Question Clarity, Question Relevance, Content Validity, Content Accuracy, No bias and Language Accuracy.

Data Analysis Techniques using qualitative descriptive method based on the stages of development with the steps to produce a product as for the following steps: (1). Needs Analysis (2).Assessment Instrument Design (3) Validation of Assessment Instrument Design (4). Revision of Assessment Instrument Design (5). Assessment Instrument Trial and (6). Revision of Assessment Instruments.

IV. Results and Discussion

4.1 Results

The development of an assessment instrument in improving analytical thinking skills is carried out in the 5th Semester Accounting Education Study Program. The assessment instrument in its development is carried out by analyzing the needs for assessment instruments, designing assessment instruments that refer to the curriculum, syllabus and RPS for Service Company Accounting courses. The stages of research development using the Thiagarajan model go through four stages, namely: (1). Define stage, (2). Design Phase, (3). Hold Development and (4) Deployment stages. This research is only at the development stage.

a. Define Stage

The first planned research activity is to conduct a needs analysis on the importance of the assessment instrument. It is known that in the teaching and learning process there is an assessment. Sudjana (2016) states: The purpose of the assessment is: (1) to describe students' learning skills so that their strengths and weaknesses can be known in various fields of study or subjects they take, (2) to determine the success of the education and teaching process in schools, namely how effective it is in changing the behavior of students towards the expected educational goals. The purpose of the assessment expressed by Sudjana shows that the assessment can measure how the implementation of learning carried out by lecturers and students is in accordance with the expected goals and to measure the ability or competence of students for the learning carried out. Service company accounting material in this study is limited to general journal material.

The important thing that must be understood in the journal is understanding the concept, how to analyze a transaction, understanding the accounts that arise from the transaction, how to position the account in relation to the debit and credit positions and how to enter the account into the journal column. Journal material is a key first step in accounting, because the truth and accuracy of recording in the journal determines the correctness of the preparation of financial statements and how to interpret the financial statements in the interest of management. This is the basis for determining the journal material in this study. The curriculum used is the KKNI curriculum which has learning outcomes at level 6

b. Design / Design Stage

Designing an assessment instrument begins with the preparation of an assessment instrument grid, the goal is that the assessment material is truly representative and relevant to the subject matter that has been given by the teacher to students in accordance with the syllabus or lesson plans, the next step is to assemble a test or develop a draft assessment instrument. Assessment is a process carried out through the steps of planning, preparation of assessment tools, and gathering information through a number of evidence that shows the achievement of student learning outcomes, management and use of information (Aini, 2019). In the application of peer assessment, it is expected that students can build criticism and input directly to the students assessed, because usually if the assessment is only limited to the teacher, it is constrained by the number of students who many teachers find it difficult to criticize errors and assess student attitudes one by one (Pane, 2019). Assessment is an activity that cannot be separated from general learning activities. All learning activities carried out must always be followed or accompanied by assessment activities. (Nurgiantoro in Mindayani, 2019). The form of the question, the number of questions and the number of questions can be seen in the following table:

Table 1. Assessment Instrument Grid

Sub CP MK	Learning materials	Indicators of Competence Achievement	Test Form	Question Number	Number of Questions
Students can have competence in: 1. Define Describe Journal function 2. Record transactions in the journal 3. Determine the accounts that affect transactions **4.** Accounts to be recorded as debits and accounts to be recorded as credits	General ledger	1. Describe the function of the journal correctly	Multiple choice	1,2,3	3
		2. Describe the classification of accounts correctly		15, 17	2
		3. Analyze transactions based on the normal position of the account		4, 5, 6, 7, 8, 9, 10, 18, 25 11, 12, 13, 14, 19	9 5
		4. Setting the position of the account in the journal		21, 22, 23	
		5. Fill in the journal column of the source document correctly		16, 20, 24	3 3
		6. Studying the Journal carefully			

The preparation of the test is carried out based on the grid that has been designed. The number of tests that are arranged is 25 questions in the form of multiple choice. The test design that is prepared must refer to the GPA and learning objectives that have been formulated previously so that the assessment can be measured. "According to Sudjana (2016) Question writing is the translation of indicators into questions whose characteristics are in accordance with the grid guidelines, each question must be clear and focused and use effective language both in the form of questions and in the form of answers".

c. Development Stage

The development of the assessment instrument was carried out by testing the validity of the test and testing the reliability of the test.

d. Test Validity

The development stage of the assessment instrument was carried out by validating the test instrument by a team of experts from the lecturers as many as three people, namely: (1) Mariati, S.Pd, M.Ak. (2) Pipit Putri Hariani MD, S.Pd, M.Sc. (3) Sofia, SE, M.Ak. The results of the validation carried out by the Lecturer are as follows:

Table 2. Expert Validation Results

Aspect	Indicator	Expert Validator			Amount	%	Average/ aspect
		I	II	III			
Clarity	1. Conformity between learning objectives and questions	5	4	5	**14**	**93.33**	
	2. Suitability of Questions with HOTs KKO (C4-C6)	5	4	4	**13**	**86.67**	
	3. Explanation of the instructions for filling out the answers	5	5	5	**15**	**100**	**93.33**
Relevance	4. Questions related to learning objectives	5	4	5	**14**	**93.33**	
	5. Questions according to the aspect to be achieved	5	4	5	**14**	**93.33**	**93.33**
Content validity	6. Statements reveal true information	4	5	5	**14**	**93.33**	**93.33**
Content accuracy	7. The accuracy of the question with the expected answer	4	5	4	**13**	**86.67**	**86.67**
No bias	8. Question contains one complete idea	4	4	4	**12**	**80**	**80**
Language accuracy	9. The language used is easy to understand	5	4	5	14	**93.33**	
	10. The language used is simple and clear	5	4	5	14	**93.33**	
	11. The correctness of the grammar used according to EYD	5	4	5	14	**93.33**	**93.33**

The validity carried out by lecturers can be said to be valid, this is explained in the following:

1. Clarity. This indicator can be said to be very good, even though the HOTs (C4-C6) component of the Conformity Problem with KKO shows an average score of 86.67 which is lower than the average score on the clarity component. the test is structured based on learning objectives and indicators of achievement of competence, the preparation of KKO in the test has referred to the HOTs which consists of analysis, synthesis and evaluation
2. Relevance, shows a very good average count of 93.33. The questions are in accordance with the aspects to be achieved, in the preparation of the questions they are in accordance with the aspects to be achieved, it can be seen from the learning objectives that have been formulated
3. Content Validity, shows a very good average count of 93.33. The questions that have been prepared have provided clear information for the validator.
4. Content Accuracy, shows a very good average count of 86.67, although it is still below the overall arithmetic average. The accuracy between the questions is in accordance with the expected answers
5. There is no bias, showing a very good average count of 80 although it is still below the overall arithmetic average. even though it shows the lowest score from the assessed aspect but this point is said to be good

6. The accuracy of the language, shows a very good arithmetic average of 93.33, the use of language in this test instrument is easy to understand, the instructions are clear and simple and the correctness of the language is in accordance with the EYD.

The conclusion given by the expert validator is that this test instrument is feasible to use without revision. The test reliability test states that the test instrument is declared reliable can be seen in the following table:

Table 3. Reliability Statistics

Cronbach's Alpha	N of Items
.712	25

Test reliability is the level of constancy (consistency) of a test, namely the extent to which a test can be trusted to produce a score that is relatively unchanged even though it is tested in different situations.

One of the aims of this research is to describe how students' analytical thinking skills are. the next step is to conduct an assessment of students' analytical skills through tests on General Journal material. This test is given to students of TA accounting education. 2020/2021 as many as 32 people via google form. Of the 32 students who returned the results of the answers as many as 29 people the results can be seen in the following table:

Table 4. Student Test Results

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20.00	5	17.2	17.2	17.2
	24.00	2	6.9	6.9	24.1
	28.00	5	17.2	17.2	41.4
	32.00	4	13.8	13.8	55.2
	36.00	1	3.4	3.4	58.6
	40.00	1	3.4	3.4	62.1
	44.00	4	13.8	13.8	75.9
	48.00	1	3.4	3.4	79.3
	52.00	2	6.9	6.9	86.2
	56.00	1	3.4	3.4	89.7
	72.00	3	10.3	10.3	100.0
	Total	29	100.0	100.0	

Table 4 shows that the lowest score is 20 and the highest score is 72. Only 10.3% of students passed and 89.7% did not pass. and the average value obtained by students can be seen in the following table:

Table 5. Descriptive Statistics

	N	Minimum	Maximum	mean	Std. Deviation
VAR00001	29	20.00	72.00	37.6552	15.91108
Valid N (listwise)	29				

Table 5 describes how the results of learning accounting with general journal material. The maximum score of students is 72 and the minimum value is 20. And the average value is 37.66 with a maximum value of 100. The conditions indicate that student learning outcomes are in the low category and it can be stated that students' thinking skills in analyzing are in the low category.

4.2 Discussion

The development of assessment instruments in improving analytical thinking skills is carried out in the 5th Semester Accounting Education Study Program. The assessment instruments in their development are carried out through the stages of define, design and development. In the development of the assessment instrument, the validity and reliability of the assessment instrument is carried out. The validity test of the assessment instrument was carried out by a team of experts in this case the lecturer stated that the assessment instrument was valid and feasible to be tested, while the reliability test stated that the assessment instrument was reliable and concluded that the assessment instrument was suitable for use without revision. The student's analytical thinking ability test was carried out by answering tests through Google Form stating that students' analytical thinking skills were in the low category because the test results had the lowest score of 20 and the highest score of 72 with an average count of 37.66. The test results obtained show a picture that the ability to think in analyzing students is very low. The obstacle in this research is that the research was conducted during a pandemic so that all research activities are carried out online.

V. Conclusion

Based on the research discussion, it is concluded that the development of the assessment instrument is carried out through three stages, namely the Define stage, the Design stage and the Development stage. The Assessment Instrument is designed to refer to the KKNI Curriculum, Syllabus, RPS, Competency Achievement Indicators and learning objectives. The assessment instruments were tested for validity and test reliability tests which stated that the validity of the tests carried out by the expert team in this case the lecturers declared valid and the test reliability tests were declared reliable, the test instruments designed were feasible to be used without revision.The results of the test to students stated kThinking ability to analyze students through journals can be categorized as low, this can be seen from the average score of 37.66. The next research is recommended to examine learning that can improve analytical thinking skills through innovative, creative learning in the 4.0 revolution era.

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