Need Analysis for Development of WEB-Based Assessment Based on Bloom's Taxonomy Theory in Bilingual Learning Courses of PGSD Department at Medan State University

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Abstract. This research aims to analyze the need to develop an assessment instrument that can accurately measure student learning outcomes in bilingual learning courses, analyze the need for the use of technology in implementing Learning Assessment, and analyze the material and learning objectives contained in the curriculum tool. This research is a type of qualitative research. Based on the interviews with 2 lecturers in the Bilingual Learning course in the PGSD department at Medan State University, the researchers concluded that the learning assessment that has been used so far has not been designed by the theory of measuring learning outcomes. Learning Assessments are made only based on the indicators of success in learning outcomes stated in the Lesson Plan. To analyze student needs, researchers used a questionnaire instrument with a total of 18 statement items. There are 3 components that researchers measure, namely- Material Components, Technology Utilization Components, and Learning Outcome Measurement Model Components.

Keywords: Web-based, Assessment, OBE, Bloom Taxonomy, OBE.

1 Introduction

Education is a conscious and planned effort to create a learning atmosphere and learning process for students to actively develop their potential to have spiritual religious strength, self-control, personality, intelligence, noble morals, and skills needed by themselves and society. One thing that cannot be separated from the field of education is learning outcomes. The learning outcomes obtained by students greatly influence the success of learning objectives. Learning outcomes can be one of the benchmarks of a teacher's success in carrying out teaching and learning activities [1]. In order to achieve educational goals, a curriculum is needed.

The curriculum is an instrument of educational programs and courses from educational institutions concerning the design of a lesson for education participants at a certain level of education. The preparation of a course instrument must be in accordance with the abilities and conditions of each level of education in the implementation of educational activities and the needs of the workforce. According to Ornstein, a curriculum design refers to the naming of the

ICIESC 2024, September 17, Medan, Indonesia

DOI 10.4108/eai.17-9-2024.2352887

planning of several components or parts or elements of a curriculum. The parts in it include: 1) goals and objectives (aims and objectives); 2) subject matter (subject matter); 3) learning experience methods (method and organization); and 4) evaluation (evaluation) [2].

The quality of a study program's curriculum can affect various aspects of the services received by students. Therefore, various improvement efforts continue to be made to improve the quality of the higher education curriculum in Indonesia. This is evident from the issuance of Permendikbud Number 3 and Number 5 of 2020 concerning the National Standards for Higher Education and the Higher Education Accreditation System which regulates the quality standards of higher education. The adjustment of these standards requires all study programs to review the curriculum used. This review is related to the suitability of graduate profiles, graduate learning outcomes, study materials and courses to the Outcome Based Education (OBE) approach which focuses on the competencies obtained by students.

Outcome-Based Education (OBE) is a student-centered learning approach that prioritizes the achievement of certain learning outcomes for all students. This approach ensures that students achieve the learning objectives set in their learning process [3]. Assessment in the Merdeka Belajar Curriculum era generally uses outcome-based education (OBE) as the main reference for standards, with a focus on skills that students can do at the end of the learning process. As part of the education system, OBE does many things including curriculum reformulation, teaching and learning, assessment, and monitoring/evaluation in the education process [4].

Learning Assessment, or learning assessment, is a systematic process of collecting, analyzing, and interpreting information about what students know, understand, and can do as a result of their educational experiences. It is an integral component of the learning process that helps educators and educational institutions evaluate the effectiveness of instruction, identify areas where students may need additional support, and make data-based decisions to improve learning outcomes [5]. Assessment focuses not only on measuring factual knowledge, but also includes evaluating higher-order skills, conceptual understanding, and the ability to apply knowledge in real-world contexts [6]. Furthermore, modern learning assessment emphasizes the importance of formative feedback, which provides diagnostic information to students and teachers throughout the learning process, allowing for timely adjustments and improvements [7].

Bloom's Taxonomy-based Learning Assessment is an approach to assessing learning that uses a hierarchical framework of six cognitive levels developed by Benjamin Bloom and his colleagues. This taxonomy, later revised by Anderson and Krathwohl, provides a structure for classifying learning objectives and designing appropriate assessments. These cognitive levels, from simplest to most complex, are: remember, understand, apply, analyze, evaluate, and create [8]. In the context of learning assessment, this approach allows educators to design assessment instruments that measure not only factual knowledge, but also higher-order thinking skills [9]. For example, an assessment at the 'remember' level might involve simple multiple-choice questions, while an assessment at the 'create' level might require a complex project or innovative problem solving. By using Bloom's Taxonomy as a guide, educators can ensure that their assessments cover a range of cognitive levels, encourage the development of critical thinking skills, and provide a more comprehensive picture of students' understanding and abilities.

21st century learning emphasizes that the process of assessing knowledge or cognitive is carried out not only in printed form, many schools have used technological assistance (ICT) both in online learning and in evaluating learning outcomes. The use of technology in the evaluation

process such as the use of smartphones as a container for evaluation tools will make evaluation tools more interesting and efficient and can make it easier for educators to evaluate student learning outcomes.

Based on the explanation above, the author believes that there needs to be a needs analysis of the use of Computer Information Technology (ICT) in the implementation of student learning outcome evaluations designed based on Bloom's taxonomy theory. This assumption was born from the understanding that the author obtained after reading Anderson's writing which argued that Learning assessment based on Bloom's taxonomy theory has a crucial role in modern education for several interrelated reasons. First, this taxonomy provides a comprehensive and hierarchical framework for measuring various levels of student cognition, from basic to more complex levels.

2 Method

This research is a qualitative research. To obtain research data, there are several data collection methods that have been used by the author, namely questionnaire methods, interviews and literature studies. Qualitative research is a methodological approach that aims to understand and interpret social phenomena and human experiences in depth [11]. Unlike quantitative research that focuses on numerical measurements and statistical analysis, qualitative research explores the meaning, perceptions, and subjective experiences of research participants [12].

3 Results

The researcher conducted the analysis stage to find out the objectives of the Bilingual learning course, to find out the materials contained in the Bilingual Learning course and to find out students' readiness for the use of technology in implementing the evaluation of learning outcomes in the Bilingual Learning course. To obtain needs analysis data, the researcher conducted interviews with 2 (two) lecturers in charge of the Bilingual Learning course. Furthermore, to find out students' readiness, the researcher distributed questionnaires to 30 students. The results of the needs analysis are explained as follows:

3.1 Analysis of Learning Objectives for Bilingual Learning Courses.

Based on interviews with 2 (two) lecturers in charge of the Bilingual Learning course, the researcher concluded that the Bilingual Learning in Elementary Schools course aims to prepare prospective teachers and education practitioners to implement bilingual learning effectively at the elementary school level. The main objective is to provide an in-depth understanding of the theory and concepts of bilingual learning and develop the pedagogical skills needed to teach in a bilingual context. Students are expected to be able to improve their language competence, understand the socio-cultural context of bilingual education, and develop the ability to design appropriate learning materials. This course also aims to hone skills in assessing and evaluating bilingual students and developing collaboration and communication skills with various stakeholders in bilingual education.

In addition, this course aims to encourage reflective practice and continuous professional development in the field of bilingual education. Students are prepared to identify and analyze contemporary issues and face common challenges in the implementation of bilingual programs

in elementary schools. Through a combination of theory and practice, this course aims to equip students with the knowledge, skills, and attitudes needed to become effective educators in bilingual learning environments. Thus, graduates are expected to contribute significantly to the development and implementation of quality bilingual education programs at the elementary school level, preparing the younger generation to face the demands of an increasingly multilingual and multicultural global society.

3.2 Analysis of Bilingual Learning Course Material.

The researcher has conducted interviews with 2 (two) lecturers in charge of the Bilingual Learning course, and the researcher has also conducted a study of the objectives of each lecture material through a literature study. The conclusion from the results of the interviews and literature study is that there are 9 main materials for the Bilingual Learning course, namely:

1. *The Concept of Bilingual Program on Elementary School*
2. *Learning Management on Bilingual Program of Elementary School Level.*
3. Content and Language Integrated Learning (CLIL) pedagogy.
4. Introduction and Greetings.
5. Checking attendance, organizing classroom, and ending lesson
6. Giving instructions in English
7. Recalling routines, being good – positive approach to discipline.
8. Explaining and demonstrating
9. Teaching Mathematics for Elementary students through English

3.3 Analysis of Student Needs for Web-based Assessment Based on Bloom's Taxonomy in Bilingual Learning Courses.

There are 3 (three) aspects that the author uses as a reference in making the student needs analysis questionnaire instrument, namely the assessment item component, technology utilization and learning outcome measurement component. The results of the student needs questionnaire are described as follows.

A. Results of the Student Needs Questionnaire on the Assessment Material Component Aspect

There are 6 (six) statements to determine the components of the assessment items needed by students in the web-based assessment. The percentage of student answers is shown in Table 1 below.

Table 1. Percentage of Student Answers on the Assessment Material Component Aspect

Component	Statement	Response	Percentage
A. Assessment material components	Assessment items support the measurement of the ability to recall important information.	Need	85%
		No need	15
	Assessment items can measure understanding of key concepts in learning.	Need	90%
		No need	10%
	Assessment items measure knowledge in practical contexts related to Bilingual learning.	Need	90%
		No need	10%
		Need	85%

Component	Statement	Response	Percentage
	Assessment items measure the ability to analyze information and make connections between concepts.	No need	15%
	Assessment items in essay and multiple choice form	Need	85%
		No need	15%
	Assessment materials that encourage me to create new ideas or products based on the knowledge gained.	Need	90%
		No need	10%

The table shows the percentage of student questionnaire responses. From the results of calculating the average answers for each sub-component of the assessment material, 87.7% of students stated that it was necessary and 22.3% stated that it was not necessary.

B. Results of the Student Needs Questionnaire on the Aspect of Technology Utilization

There are 6 (six) statements to determine students' needs for the use of technology in learning. The percentage of student answers is shown in Table 2 below.

Table 2. Percentage of Student Answers on the Aspect of Technology Utilization

Component	Statement	Response	Percentage
A. Assessment material components	An easy-to-access and easy-to-use web-based assessment platform	Need	100%
		No need	-
	The technology used supports the presentation of multimedia materials (text, images, audio, video)	Need	90%
		No need	10%
	Interactive features (such as online quizzes, simulations) help understanding and application of the material.	Need	95%
		No need	5%
	Automated scoring system provides fast and accurate feedback	Need	90%
		No need	10%
	Technology supports online collaboration and discussion between learners.	Need	95%
		No need	5%
	Interactive website with attractive appearance	Need	90%
		No need	10%

The table shows the percentage of student questionnaire responses. From the results of calculating the average answers for each sub-component of the technology utilization material, 93.3% of students stated that it was necessary and 6.7% stated that it was not necessary.

C. Results of Student Needs Questionnaire on Measurement Model Aspects

Table 3. Measurement Model Aspects

Component	Statement	Response	Percentage
A. Measurement Model	Web-based assessments involve tasks that require the application of knowledge in new situations.	Need	80%
		No need	20%
	Some questions require in-depth analysis of information or cases.	Need	90%
		No need	10%
	There are assessment items that can measure student involvement in completing projects or tasks to create new ideas/products.	Need	95%
		No need	5%
	The assessment includes questions that test the ability to recall important facts and concepts.	Need	80%
		No need	20%
	Assessment model according to the cognitive level being tested	Need	90%
		No need	10%
	The feedback provided helped me understand areas for improvement at each cognitive level.	Need	95%
		No need	5%

The table 3 above shows the percentage of student questionnaire responses on the measurement model aspect. From the results of the calculation of the average answer for each sub-aspect of the measurement model, 90% of students stated that it was necessary and 10% stated that it was not necessary.

4 Discussion

Learning Assessment, or learning assessment, is a systematic process for collecting, analyzing, and interpreting information about what students know, understand, and can do as a result of their educational experiences [13]. It is an integral component of the learning process that helps educators and educational institutions evaluate the effectiveness of instruction, identify areas where students may need additional support, and make data-based decisions to improve learning outcomes. Assessment focuses not only on measuring factual knowledge, but also includes evaluating higher-order skills, conceptual understanding, and the ability to apply knowledge in real-world contexts.

Bloom's Taxonomy-based Learning Assessment is an approach to learning assessment that uses a hierarchical framework of six cognitive levels). This taxonomy, later revised by Anderson and Krathwohl, provides a structure for classifying learning objectives and designing appropriate assessments. These cognitive levels, from simplest to most complex, are: remembering, understanding, applying, analyzing, evaluating, and creating.

Based on the explanation above, the author believes that there needs to be a needs analysis of the use of Computer Information Technology (ICT) in the implementation of student learning outcome evaluation designed based on Bloom's taxonomy theory. To obtain data for the Web-

based Assessment needs analysis in the course, the author conducted a qualitative study. Based on interviews with 2 (two) lecturers in charge of the Bilingual Learning course, the researcher concluded that the Bilingual Learning course in Elementary Schools aims to prepare prospective teachers and education practitioners in implementing bilingual learning effectively at the elementary school level. The main objective is to provide a deep understanding of the theory and concept of bilingual learning, as well as develop the pedagogical skills needed to teach in a bilingual context. Students are expected to be able to improve their language competence, understand the socio-cultural context of bilingual education, and develop the ability to design appropriate learning materials. From the results of the calculation of the average answer for each sub-component of the assessment material, 87.7% of students stated that it was necessary and 22.3% stated that it was not necessary. In other words, students need an assessment instrument that can measure their learning outcomes, not only measure their knowledge but also be able to deepen their analytical skills. Furthermore, from the results of the calculation of the average answer for each sub-component of the material on the use of technology, 93.3% of students stated that it was necessary and 6.7% stated that it was not necessary. So it can be concluded that students need the use of technology not only in the learning process but also in terms of measuring learning outcomes. From the results of the calculation of the average answer for each sub-aspect of the measurement model, 90% of students stated that it was necessary and 10% stated that it was not necessary. So it can be concluded that students also need a measurement model that contains the components of Bloom's Taxonomy measurement.

5 Conclusions

The main objective of the Bilingual Learning course is to provide an in-depth understanding of the theories and concepts of bilingual learning, as well as to develop the pedagogical skills needed to teach in a bilingual context. Students are expected to improve their language competence, understand the socio-cultural context of bilingual education, and develop the ability to design appropriate learning materials. This course also aims to hone skills in assessing and evaluating bilingual students, as well as developing collaboration and communication skills with various stakeholders in bilingual education. The results of the needs questionnaire analysis consisting of 3 main aspects, namely with an average percentage of above 90%, it can be concluded that students need a learning outcome measurement instrument designed based on Bloom's Taxonomy and also utilizing technology in implementing the measurement of learning outcomes for the Bilingual Learning course.

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