

# Development of Online Lecture Process Assessment Indicators

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## ABSTRACT

In the ever-evolving digital era, online lectures offer greater flexibility and accessibility compared to conventional methods. However, significant challenges arise in ensuring the active participation of students during online lectures.

**AIMS:** This research aims to develop an assessment instrument for the online lecture process that is valid, effective, and practical.

**Place and Duration of Study:** Ahmad Dahlan Islamic University, Sinjai Regency, South Sulawesi, during the 2023-2024 academic year.

**Methodology:** This study uses a Research and Development (R&D) methodology with an ADDIE (Analysis, Design, Development, Implementation, Evaluation) approach. The first step is a needs analysis to understand the needs of assessments in online lectures. The design and development stage involves the preparation of valid assessment instruments based on indicators of validity, effectiveness, and practicality. This instrument was tested for validity and reliability using the Gregory method.

**Results:** The implementation stage is carried out by applying assessment instruments that have been developed in several online classes at Ahmad Dahlan Islamic University. Data collection was carried out through observations, questionnaires, and interviews to assess the effectiveness of the assessment model. The results of the study show that this assessment instrument is able to increase the active participation and quality of student interaction in online lectures. The assessment instrument used has high validity and reliability with a content validity coefficient of 0.95.

**Conclusion:** The application of this assessment instrument also has a positive impact on the quality of learning, where students show an increase in the use of technology and digital literacy. Lecturers feel helped by the systematic and easy-to-use assessment format. Overall, this study concludes that the assessment model developed is effective in assessing student activities during online lectures and can be adopted more widely to improve the quality of online learning in various universities.

*Keywords: Online Lecture Assessment, Instruments, validity, effectiveness,*

## 1. INTRODUCTION

Higher education has undergone a significant transformation in line with the development of information technology and the demands of the 4.0 technology era towards society 5.0. This created the concept of distance learning in response to this change[1], [2], [3], [4]. Distance learning allows the teaching and learning process to continue despite physical restrictions. In the context of mathematics lectures in universities, e-learning has emerged as a significant alternative, becoming a solution to challenges in education[5]. However, the transition to online learning also brings new challenges, especially in terms of assessing student learning outcomes[6].

Assessment is the process of collecting, synthesizing, and interpreting information to make decisions [7]. Online learning assessments require different indicators than face-to-face assessments. Assessment indicators must be able to measure learning outcomes objectively and comprehensively in a virtual context[8]. The concept of assessment of the lecture process is becoming increasingly relevant and urgent[9].

It is important to remember that assessment is not only about logistics (what, when, why, and how), but also about achieving the desired level of success in the course and skill development [10], [11]. The learning process must be meaningful and students become more progressive so that it not only develops the cognitive shutter but can improve the affective and psychomotor shutter of students through the process of assimilation and accommodation developed by Piaget and Vigotsky so that the assessment process is not only at the end of the lecture but is also needed in the lecture process[12]. A good assessment is the right assessment to measure achievement indicators and in what way lectures are carried out, for that it is necessary to have assessment techniques in the form of observations, performance checks, and the like[12].

Guidelines are needed in the implementation of the assessment of the lecture process for students. It is important for students to know or be aware that the lecturer is conducting an assessment, including during the lecture process [13]. Students should be told to do their best or reminded of the importance of demonstrating their true beliefs and feelings on affective assessments related to effort.

However, there is no comprehensive framework that specifically addresses the development of effective assessment indicators for online lectures in universities. Therefore, this study aims to develop an assessment indicator model that can be adapted and implemented in the context of online learning. It is hoped that the results of this study can be a reference for universities in evaluating student learning outcomes online more optimally.

## **2. METHODOLOGY**

This study uses the Research and Development (R&D) method by applying the ADDIE (Analysis, Design, Development, Implementation, and Evaluation) model to develop effective assessment indicators in online lectures in universities.

### **2.1 ADDIE Models**

#### **2.1.1 Analysis Stage:**

At this stage, a need analysis is carried out on assessment indicators that are appropriate for the context of online lectures. The analysis includes the identification of assessment challenges and weaknesses in online learning, as well as a literature review related to assessment indicators that have been applied previously. The analysis was carried out through literature studies, interviews with lecturers and students, and needs surveys.

#### **2.1.2 Design Stage:**

Based on the results of the analysis, the research team designed a conceptual framework and assessment indicator model that can be adapted for online lectures. The design is carried out by considering the principles of effective assessment, such as validity, reliability, objectivity, and practicality. This stage also includes the preparation of a blueprint for assessment indicators along with the assessment rubric.

#### **2.1.3 Development Stage:**

At this stage, the assessment indicators and rubrics that have been designed are developed in more detail. The research team involved online learning assessment experts to validate and provide suggestions for improvements to the developed model. The revision was carried

out based on input from experts until a final prototype of the assessment indicators was obtained.

#### 2.1.4 Implementation Stage:

The prototype of the assessment indicators that have been developed is then implemented in several online courses in universities that are the subject of research. The implementation stage aims to test the effectiveness and practicality of the implementation of the assessment indicators in the context of actual online lectures.

#### 2.1.5 Evaluation Stage:

In the final stage, a comprehensive evaluation of the implementation of assessment indicators is carried out. Evaluation includes collecting feedback from lecturers and students, analyzing the achievement of learning outcomes, and identifying obstacles and challenges faced. The results of the evaluation are used to improve the assessment indicator model so that it can be implemented more optimally.

### 2.2. TEST SUBJECTS

The resulting lecture assessment products will be tested in the Mathematics Study Program, Ahmad Dahlan Islamic University, Sinjai Regency using a *purposive sampling* technique with limited trials

#### 2.2.1. Lecturer Criteria

- Lecturer of Mathematics Study Program
- Willing and able to apply the online lecture assessment model developed.
- Have experience in online teaching and the ability to use educational technology.

#### 2.2.2. Student Criteria

- Actively participating in online lectures in the Mathematics Study Program.
- Taking courses that are the focus of research.
- Have adequate access to the technology needed for online lectures.
- Demonstrate active and consistent participation in online lectures.

This study involved three lecturers who carried out a trial with three different classes:

Class A: A total of 17 students.

Class B: A total of 8 students.

Class C: A total of 13 students.

### 2.3. DATA ANALYSIS TECHNIQUES

#### 2.3.1. Validity Data Analysis

Instrument assessment using the validation of the Gregory method, Content Validity

Coefficient =  $\frac{D}{A+B+C+D}$  [14].

Table 1. Validity indicators

Aspects	Indicators
Quality of content and purpose	a. Accuracy b. Completeness c. Justice d. Balance e. Suitability to student conditions

\*Source[15], [16], [17]

### 2.3.2. Effectiveness Data Analysis

**Table 2. Effectiveness Indicators**

Aspects	Indicators
Instructional quality	a. Objective assessment b. Giving a positive impact to students c. Increasing students' motivation to learn d. Instructional flexibility

\*Source[18]

### 2.3.3. Practical Data Analysis

**Table 3. Practicality indicators**

Aspects	Indicators
Technical quality	a. Easy to use b. Quality of answer handling c. The quality of the program management d. The quality of the documentation

### 2.3.4. Criteria for Assessing the Implementation of Instruments

**Table 4. Criteria for assessing the implementation of research instruments**

No	Interval	criterion
1	$3.5 \leq x \leq 4$	Highly Active
2	$2.5 \leq x < 3.5$	Active
3	$1.5 \leq x < 2.5$	Less Active
4	$1 \leq x < 1.5$	Inactive

\*Source[19], [20]

$$\text{Dimensional effectiveness} = \frac{\sum \text{Nilai indikator}}{\sum \text{Indikator}}$$

$$\text{Effectiveness of student assessment in 1 meeting} = \frac{\sum \text{Nilai Dimensi}}{\sum \text{Dimensi}}$$

$$\text{Effectiveness of meeting assessments} = \frac{\sum \text{Nilai Permahasiswa}}{\sum \text{Mahasiswa}}$$

$$\text{Effectiveness of student assessment in 1 semester} = \frac{\sum \text{Nilai Perpertemuan}}{\sum \text{pertemuan}}$$

## 3. RESULTS AND DISCUSSION

The results of the development of online lecture assessment instruments are presented in the following table:

**Table 5. Results of the Development of Online Lecture Process Assessment Indicators**

Dimension	Activity	Indicators	Relevance of Theory/Research Results
Obedience & Compliance	1. Activating the Camera 2. Dress neatly & Politely 3. Conducive learning place	1. Visual interaction 2. Active presence	1. Lecturers & students create an effective learning process & take responsibility for their

		<ul style="list-style-type: none"> <li>3. Focus &amp; concentration</li> <li>4. Compliance with rules</li> <li>5. Clean &amp; organized</li> <li>6. Polite</li> <li>7. Obey the norms</li> <li>8. Physical comfort</li> <li>9. Stable internet</li> <li>10. Lecture equipment available</li> </ul>	<ul style="list-style-type: none"> <li>conditions and knowledge [21].</li> <li>2. Learning is a process of behavior change that occurs through interaction with the environment observed through the senses [22]</li> <li>3. Vygotsky's theory provides an explanation that the interaction of interpersonal (social), cultural-historical, and individual factors is the key to human development</li> </ul>
Enthusiasm	<ul style="list-style-type: none"> <li>1. Attitude &amp; Presence</li> <li>2. Actively Respond</li> <li>3. Provide solutions</li> </ul>	<ul style="list-style-type: none"> <li>1. Present at the beginning</li> <li>2. present at the core</li> <li>3. present at the end</li> <li>4. Respond</li> <li>5. Inquiry Initiative</li> <li>6. Quality &amp; Relevance of Responses</li> <li>7. Accuracy of analysis</li> </ul>	<ul style="list-style-type: none"> <li>1. Behaviorist learning theory is the relationship between stimuli and responses shown by individuals through interaction with the environment [23]</li> <li>2. The theory of constructivist learning also emphasizes that students think more confidently, more progressively and better in the activities they do. The teaching and lecture process is more memorable and meaningful so that the activities carried out can attract the attention of students Piaget's Theory is strong for the constructivist view that students learn well when they actively build information and knowledge.</li> </ul>
Openness to Learning	<ul style="list-style-type: none"> <li>3. High year's craving</li> <li>4. Able to adapt</li> <li>5. IT Skilled</li> </ul>	<ul style="list-style-type: none"> <li>1. Participation</li> <li>2. Exploration</li> <li>3. Material research</li> <li>4. Technical proficiency</li> <li>5. Challenge resilience</li> <li>6. self-sufficient</li> <li>7. IT proficient</li> </ul>	<p>The growing use of social networking tools has also brought attention to the contribution of social and collaborative lectures [24], [25]</p> <p>Scientific approach by enabling students to explore and elaborate the material studied [26].</p>

			Application of AI principles, <i>machine learning</i> , & HOTS [27]
Collaborate	<ol style="list-style-type: none"> <li>1. Able to Collaborate</li> <li>2. Group contributions</li> <li>3. Group IT utilization</li> </ol>	<ol style="list-style-type: none"> <li>1. Effective communication</li> <li>2. Timely response</li> <li>3. Be actively involved in the group</li> <li>4. Teamwork</li> <li>5. Quality of contribution</li> <li>6. conflict resolution</li> <li>7. creativity in the use of IT</li> </ol>	Behaviorism and constructivism theories that lead students to cooperate and communicate effectively [28], [29]
Independence	<ol style="list-style-type: none"> <li>1. Time Management</li> <li>2. Self-management</li> <li>3. active unattended</li> </ol>	<ol style="list-style-type: none"> <li>1. Efficiency</li> <li>2. On time</li> <li>3. Additional learning resources</li> <li>4. Focus &amp; concentration</li> </ol>	A scientific approach so that students are able to explore and elaborate so that they can become systematic problem solvers [26]
Positive Response to Feedback	<ol style="list-style-type: none"> <li>1. Reflection</li> </ol>	<ol style="list-style-type: none"> <li>1. Make repairs</li> </ol>	The theory of constructivism involves individuals in solving problems, improving thinking skills, and being productive [30], [31].
Involved in all lecture activities	<ol style="list-style-type: none"> <li>1. Responding at the end of the lecture</li> </ol>	<ol style="list-style-type: none"> <li>1. Making conclusions</li> </ol>	There is an increase in ability and a change in the level of practice for the better according to the theory of behaviorism [32]

The main findings in this study are as follows:

- **Adaptation and Openness to Technology:**  
The study found that students gradually showed good adaptation to the use of technology in the online lecture process. Most students are able to take advantage of various digital learning platforms, such as Google Docs and other collaboration applications, to complete assignments together even though they are in different locations. This increases collaboration and active participation of students in lectures.
- **Increasing Student Activity and Creativity:**  
One of the positive impacts of the implementation of this assessment model is the increase in student activity and creativity. This assessment model triggers students to be more proactive in looking for additional references, discussing, and doing assignments. Students not only rely on the material delivered by lecturers but also conduct independent exploration, which can be seen from their enthusiasm in providing responses and feedback during lecture discussions.
- **Effectiveness of the Learning Process:** The results show that this assessment model helps in creating a more structured and systematic learning process. Lecturers who apply this assessment model are able to provide a more objective and comprehensive assessment of student activities. This also helps lecturers in planning and carrying out

lectures more efficiently, in accordance with the goals and expectations of the curriculum. Another finding is that with the assessment of this process, lecturers have a reference in controlling the course of lectures so that lecturers must prepare themselves by completing assessment instruments that will be used to monitor students.

- **Lecturer and Student Satisfaction:** The study also found that both lecturers and students were satisfied with the assessment model applied. Lecturers feel helped by the existence of a clear and systematic assessment format, while students feel more cared for and motivated to actively participate in lectures. This satisfaction is reflected in the increase in students' grades and achievements, the majority of which are in the "Good" and "Very Good" categories.

**The Role of the Independent Learning Curriculum:** The findings of this study are also in line with the principles of the Independent Learning Curriculum initiated by the Minister of Education. The assessment model developed supports flexibility, independence, and personalization of learning, where students can learn according to their interests and abilities. This supports the goals of Independent Learning which focuses on competency-based and project-based learning.

**Table 6. Results of Practicality and Validity**

It	Subject	Observation Indicators				
		Practicality		c. Lecturer Response	Effectiveness	
		a. Implementation of Online Lectures	b. Implementation of the Process Assessment Model		a. Student Activities	b. Student Response
1	First Lecturer	2.8	2.9	3.0	2.9	2.8
2	Second Lecturer	2.5	2.8	2.9	2.8	2.6
3	Third Lecturer	3.1	3.3	3.5	3.3	3.0
Value		<b>2.8</b>	<b>3.0</b>	<b>3.1</b>	<b>3.0</b>	<b>2.8</b>
Achievement Category		<b>2.9 (Practical)</b>			<b>2.9 (Effective)</b>	

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