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## DEVELOPING WEB-BASED PERFORMANCE ASSESSMENT IN INTEGRATED SCIENCE COURSE

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### ABSTRACT

This research aims to develop a web-based performance assessment in Integrated Science course. The research was Research and Development (R & D). The expert validation of developed products resulted the average percentage of 3.88 for content category, 3.94 for format category, and 3.78 for language category. Meanwhile, critical thinking skill aspect resulted percentage of 92.20 basic clarification indicators, 90.05 for basic for the decision category, and 94.67 for inference category. Students also responded positively to web-based performance assessment in Integrated Science course.

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**Keywords:** Critical Thinking Skills; Integrated Science; Web-based Performance Assessment

### INTRODUCTION

Science is the object of a very extensive study, which consists of set of concepts, principles, laws, and theories that are formed through the scientific attitude and discovery process skill. Susetiyono (2010) stated that the science and technology grow rapidly in this century and are expected to be more in the next century. Science underlies technology advances, so it should be presented attractively, to develop students' curiosity habit of learning.

Integrated science learning is a science lesson presented integrately as one unit of physics, biology, and chemistry material, so it does not presented separately. Referring to that explanation, this integrated learning will help students to acquire integrated science knowledge of and whole views of life, real world, and universe phenomena. Indirectly integrated learning requires lecturer to master science material integrately, make variation, and develop materials in the form of integrated topic (Salirawati, 2009).

Integrated Science is a course that considers the process and product of the learning result. Therefore, the test and assessment should be applied to both process and product. Integrated processes in integrated science learning is often associated with skills in performing tasks of observation, measurement, or lab experiment, data analysis, and so on. So in order to assess the learning process in integrated science learning it needs appropriate type of assessment., The type of assessment that can assess those skills is a performance assessment (performance appraisal) (Mikrajudin, 2009).

Assessment activities applied in the learning process of integrated science learning nowadays is still done conventionally. The recent assessment is used standardized assessment guidelines for assessing students' skills. Assessment based intuition or feelings tend to be more subjective than judgment assessment. Subjective assessment will make lecturer difficult to determine appropriate follow-up. To overcome this, the appropriate instrument with the appropriate and clear criteria is needed, so the subjectivity in the assessment can be avoided.

Web-based performance assessment is ap-

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appropriate assessment technique of skill aspect. Ramesh and Patel (2013) stated that web-based performance assessment is an assessment conducted to obtain data of students' ability of finishing tasks related to lecturing material. Web-based performance assessment requires students to demonstrate their knowledge, understanding, and skill. Demonstration of knowledge, understanding, and skills students will appear when the experimental method applied in the lecture. Therefore, the experimental method is suitable with the web-based performance assessment and both are necessary in the process of integrated science lecture.

The development web-based performance assessment will result good assessment instrument, it will provide benefits for lecturer and student, for example it can determine the level of students' achievement in learning of actual information. Therefore, research on the development of Web-Based Performance Assessment needs to be conducted. This model is able to provide students to learn actively so there will be interaction between the students, (Giancarlo and Slunt, 2004).

Based on the background of research, this research aims to develop the effectiveness of assessment in learning activity through the development of web-based performance assessment in Integrated Science course.

## METHOD

The method used in this study is research and development (Research and Development / R & D). According Sugiono (2009) R & D is the research methods used to produce a particular product, and test the effectiveness of that product.

The study was conducted in Physics Education Study Program in Integrated Science course in one semester. Initial research activity was carried out by the preliminary study and development assessment. In the preliminary study stage, field and literature studies were conducted to determine the needs assessment related to the implementation of a web-based performance assessment.

The research subject was first semester of Physics Education FKIP University of Jember

students who took Physics I course. The data was analyzed by using quantitative descriptive analysis. The statistics is used to provide or present information of data obtained from the study can be used by others, include: expert validation, critical thinking skills, and students' response.

## RESULT AND DISCUSSION

Web-based performance assessment instruments have been developed through the expert validation. Feasibility validation of products was done by some FKIP UNEJ lecturers. Validation of the developed product consisted of two stages including stage 1 and stage 2. The validation components of stage 1 consisted of content and presentation feasibility components, each of the component was sub-component that was used to assess the feasibility of the developed products. The result of expert validation performance assessment instrument of web-based performance assessment shows that all assessment items received a positive response. Therefore, a web-based assessment performance instrument passed the first stage of assessment.

Further assessment of web-based performance assessment instrument continued to stage 2 by using BSNP assessment instruments that have been modified to be content feasibility, format and language component. The validation of stage 2 was validated by 3 experts who assessed content feasibility, format and language component.

Based on Table 1. it can be seen that the second stage of content expert validation is obtained average score of 3.88. Therefore it can be concluded that the developed web-based performance assessment was in feasible criteria. At this stage, the experts also gave some suggestion for the improvements of revising some material concept to avoid mistakes of student understanding and the language structure. Then, after the developed product was being revised and feasible, the trial was conducted for students in the classroom.

Observation of the critical thinking skills consists of several aspects. Critical thinking skills aspects according to Ennis are classified into three groups, they are Basic Clarification, Thee Basic for The Decision, and Inference. Data of

**Table 1.** Validation Result of Web-Based Performance Test Stage 2

No	Expert	Total Score	Average	Category
1	Content/Material	125	3,88	Feasible
2	Format	65	3,94	Feasible
3	Language	58	3,78	Feasible

students' critical thinking skills results can be seen in Table 2.

**Table 2.** Critical Thinking Skills

No	Critical Thinking Skill Indicator	Percentage
1	<i>Basic clarification</i>	92,20
2	<i>The basic for the decision</i>	90,05
3	<i>Inference</i>	94,67
	Average	92,31

Based on data presented in Table 2, it shows that the percentage of students' critical thinking skills is very high. Inference (drawing conclusion) aspect had the highest percentage compared to the basic clarification (give a basic explanation) and the basic for the decision (determine the decision) reason aspects. Data of students' critical thinking skills were obtained from the average score of students' worksheet on meeting 1, 2 and 3. The successful use of web-based performance assessment instrument was because the students were able to know their strength and weakness directly via the web which can be downloaded directly by them. This is based on the results of student responses who declare 100% students were interested in using a web-based assessment performance instrument in other courses. This result proved that the instrument of web-based performance assessment was effectively used in classroom assessment, because the developed web-based performance assessment instrument was different from previous assessment instruments. This is consistent with Syahrul (2010) re-

search, that said the development of competency-based assessment models in work-based learning can improve students' critical thinking skills vocational school students.

Students' response to web-based performance assessment instrument was obtained by giving the questionnaire to students after finishing learning activities. Students' response data can be seen in Table 3.

Table 3 presents students' responses of using web-based performance assessment instrument during the product development. 40 students (100%) expressed that they liked the learning material and web-based performance assessment. While 34 students (83.3%) expressed they liked learning situation and 6 students (16.7%) did not. For lecturer's teaching style aspect, 37 students (91.7%) they liked it and 3 students (8.3%) did not.

Data of students responses of learning material component showed that 40 students (100%) said that they were unfamiliar of. 38 students (100%) said unfamiliar of web-based performance assessment instrument; 40 students (100%) said unfamiliar of students' worksheet; 34 students (83.3%) said unfamiliar of learning situation lectures' teaching style and 6 students (16.7%) said familiar 37 students (91.7%) said unfamiliar lectures' teaching style and 3 students (8.3%) said familiar.

The next result showed that 40 students (100%) expressed interested to web-based performance assessment instrument. For the language used aspect in web-based performance assessment and student worksheets, 36 students (88.9%) stated that it was easily understood and 4 students

**Table 3.** Students' Response

No	Statements	Like		Dislike	
		f	%	f	%
1	Give your respond of:				
	Learning Material	40	100	0	0
	Performance Assesment	40	100	0	0
	Students' Worksheet	40	100	0	0
	Learning Situation	34	83,3	6	16,7
	Lecturer's Teaching Style	37	91,7	3	8,3
	Average	95 %		5 %	
2	Using the same process in the next learning activity.	Interested		Not interested	
		40	100	0	0
3	Language used in web-based performance assessment	Easy		Difficult	
		36	88,9	4	11,1
4	Illustration used web-based performance assessment	Like		Dislike	
		39	97,2	1	7,8

f = frequency

(11.1%) said it was not. Student responses to the questionnaire data illustrated in instrument performance web-based assessment and student activity sheets data showed a total of 39 students (97.2%) expressed pleasure and 1 student (2.7%) expressed displeasure. While the response of illustration used in web-based performance assessment showed that 39 students (97,2%) liked it and 1 students (2,7%) did not.

Student response to the developed web-based performance assessment instruments is classified as positive response. Most of students feel happy to join the learning activity by using a web-based performance assessment instrument because it is one of new media in learning process. Besides, web-based performance assessment instrument is arranged in a package that can attract student interest in learning activity and help student during learning process. Based on students' response in development stage, it can be said that the web-based assessment performance instruments development is positive. This is consistent with Listyawati (2012) research, that indicates the assessment instruments need to be developed attractively so students will not be burdened of their assessment.

### CONCLUSION

Based on the results and the discussion, it can be concluded that web-based performance assessment instrument is feasible and effective used in the Integrated Science course. It can be seen from the percentage of critical thinking skills

of 92.20% for clarification of basic indicators, 90.05% for the basic category for the decision, and 94.67% for the category of inference. Meanwhile, students also responded positively to the web-based performance assessment in Integrated Science course.

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