Validation of Learning Media Using Learning Cycle 9E Model

Fitroh Annisaul Mubarokah
Science Education Program
Post-Graduate, State University of Surabaya
Indonesia

Tukiran, Harun Nasrudin
Science Education Program
Post-Graduate, State University of Surabaya
Indonesia

Abstract:- The subjects in this study are the development of learning media using the Learning Cycle 9E model on acid base material. Learning media developed aim to improve self-efficacy and student learning outcomes. Development of learning media is carried out using the 4D development model. Data validity is obtained based on the results of the assessment by three validators from the chemistry lecturer, where the assessment is carried out using a validity test sheet in the form of questionnaire. This study aims to describe the validity of the learning media developed consisting of Lesson Plan, Student Worksheets, knowledge assessment sheets, student response questionnaires, student activity sheets, motivational questionnaire sheets, self-efficacy questionnaire sheets, and student response questionnaire. The results of the assessment of the three validators were found that the learning device developed got the value of modus 4 with a very valid category.

Keywords:- Validation, learning instruments, learning cycle 9E, self-efficacy.

I. INTRODUCTION

Teaching and learning activities are the process of interaction between students and teachers. The success of the teaching and learning process is not only influenced by the role of the teacher, but also the role of students for example in terms of confidence in themselves. Some studies state that high self-efficacy of students will improve student learning outcomes and academic achievement [1].

Self-efficacy is very important in learning activities because it can affect cognition, motivation, affective process which will affect one's behavior and can have an impact on someone's perseverance in learning [2]. The other researcher also suggests that the higher self-efficacy, student achievement in learning chemistry will get higher [3]. Conversely, if students' self-efficacy is low, their learning achievement will also be low [4].

The availability of learning in accordance with the demands of education nationally and internationally can be used to achieve the educational goals described earlier. Learning media is a set of materials used for the learning process, for example lesson plans, student worksheets, and assessment sheets. This learning media is made so that learning done in class can run well in accordance with the

objectives and competencies of learning to be achieved. The learning media based on the 9E learning cycle model is considered to be able to help improve students' self efficacy and student learning outcomes. Learning media really determine the achievement of desired learning goals, so we need a valid learning instrument to get learning objectives that are in accordance with the competencies to be achieved.

II. METHODOLOGY

The development model used in this study is the 4-D (four-D Model) [5]. Which consists of four stages, namely definition, design, development and dissemination. First, the definition phase is carried out need-analysis which includes curriculum analysis, student analysis, task analysis, concept analysis, and formulation of learning objectives. Second, the design phase aims to produce learning media based on the learning cycle 9E model. The results at this design stage are called draft I. Learning media developed include learning lesson plans, student activity sheets, and assessment sheets, motivational questionnaires, self-efficacy questionnaires, student response questionnaires. Third, the development phase is carried out to study and evaluate the learning media developed, especially on aspects of concepts, novelty, language, and ease of use by students or teachers.

At the development stage, validation of learning instruments was carried out. It was carried out by experts to get an assessment and input in the form of suggestions and criticisms of the draft learning instrument I. The instrument validation is content validation, language, format, and corresponds with the learning cycle 9E model. Suggestions and criticisms from the validator are used to improve learning media that have been developed by researchers before learning media are tested on the subject of research. The revised learning media based on the validation results is called draft II.

Data from the validation results were analyzed using quantitative descriptive analysis by calculating the average value given by the validator. This score is then adjusted to the assessment criteria shown in Table 1 [6].

Score	Category
$3,6 \leq P \leq 4$	Very Valid
$2,6 \leq P \leq 3,5$	Valid
$1,6 \leq P \leq 2,5$	Less valid
$1 \leq P \leq 1,5$	Not valid

Table 1:- Criteria for assessment of learning instrument

The validation agreement was calculated based the formula:
That

A = the highest score given by the assessor
B = the lowest score given by the assessor

An instrument is satisfied to valuation agreement if the percentage of agreement is ≥ 75%. Based on the criteria in Table 1, the learning instrument developed in this study are said to be valid if they get a score ≥ 2.6.
.

III. RESULT AND DISCUSSION

The results of the validation of the learning instruments include the plan for implementing the lesson, student worksheets, motivation armature sheets, student activity sheets, self-efficacy questionnaires, and knowledge assessment sheets which will be explained as follows:

A. Lesson Plan Validation
The lesson plan developed by using learning cycle 9E model where using the learning model is expected to be able to improve self-efficacy and student learning outcomes in acid base material in class XI of SMAN 7 Surabaya. The developed lesson plan is arranged for 3 meetings. The result of lesson plan validation which has been validated by 3 validators from chemistry department in UNESA. The results of validation were presented at Table 2.

Description	Modus	Category	PoA (Average)(%)
Lesson plan format	4	VV	92.46
Learning activities	4	VV	86
Supporting Learning activities(worksheet)	4	VV	86
Language (sentences structure)	4	VV	86

VV = Very Valid; PoA = Percentage of Agreement
Table 2:- Validation Results of Lesson Plan

Table 2 shows the data that in general the results of the validation of the Lesson Plan are arranged to have very valid categories and an average reliability of 87.62% so that it can be categorized as reliable. Followings are some suggestions for improvement from 3 validators.

Suggestion	Enhancement
Some writing procedures need to be fixed	The writing system has been fixed
The activity phase must use a number	The activity phase already uses number
Indicators must be appropriate with analyze indicators	Indicators have been appropriated with analyze indicators

Table 3:- Suggestion and Enhancement Lesson Plan

The lesson plan is a very important guide prepared by the teacher in the implementation of learning activities. The implementation plan is prepared based on the basic competency that has been set, so that it is expected that the learning objectives can be achieved thoroughly. The lesson plan which was developed by using the learning cycle 9E model, with the applied learning model expected to be able to improve students' self-efficacy. Teachers who have high self-efficacy are teachers who successfully teach their students and even naughty students [7]. The developed lesson plan was arranged for 3 times face-to-face applied to acid base material. In the three meetings successively discussed indicators of natural acid base, artificial acid base indicator and acid base strength.

B. Students Worksheet Validation
The developed worksheet is used to guide students to make it easier to understand acid base concept. The results of the Student Activity Sheet Validation validated by 3 Validators:

Description	Modus	Category	PoA (Average) (%)
Student's Worksheet format	4	VV	88.2
Eligibility	4	VV	73.3
Language	4	VV	67

V = Valid; VV = Very Valid; PoA = Percentage of Agreement
Table 4:- Validation of Student's Worksheet

Table 4 shows that in general the results of validation of Student Worksheets compiled get modus 4 with a very valid category and an average reliability show 76.2%, giving the meaning that Student Worksheets can be categorized as reliable. The followings are some suggestions for improvement from 3 validators.

Suggestion	Enhancement
Some writing procedures need to be fixed	The writing system has been fixed
There is no opportunity to read the literature before making a hypothesis	There has been opportunity to read the literature before making a hypothesis
There are some presentation of phenomena that are not appropriate	The phenomenon presented has been corrected

Table 5:- Suggestion and Enhancement Student's Worksheet

Student Worksheets is teaching material that is packaged in such a way that students are able to learn material taught independently [8]. In this study the researcher facilitates students to learn by using students worksheet for guidance in conducting practical work, thus students are expected to be able to gain an understanding of the concepts learned. The results of Student Worksheets validation are good if the worksheets compiled by the researcher pay attention to the following: (1) The titles on the Student Worksheets must be in accordance with the material, (2) the material presented is in accordance with the level of student development, (3) the material presented is simple, logical, clear, and systematic (4) able to make students actively involved in learning activities, (5) the appearance of student worksheets is simple, clear and easily understood by students, (6) images and graphics in accordance with concepts (7) location of images, tables, and questions must be appropriate, and (8) develop interest and be able to invite students to think.

C. Self efficacy Questionnaire Validation

The self-efficacy questionnaire that has been developed is used to measure the increase in student self-efficacy, where self-efficacy questionnaires are developed based on the dimensions of self-efficacy including magnitude, strength, and generality. The following is the result of student self-efficacy

Description	Modus	Category	PoA (Average)(%)
Format	4	VV	89.5
Language	3	V	89.5
Contents	4	VV	90.7

V = Valid; VV = Very Valid; PoA = Percentage of Agreement
Tabel 6:- Self efficacy Questionnaire

Table 6 show that in general the results of the self-efficacy questionnaire validation compiled have modus 4 with a very valid category and the reliability data of 89.9% mean that the results of the validation of the self-efficacy questionnaire are reliable. The following are some suggestions for improvement from 3 validators.

Suggestion	Enhancement
Some writing procedures need to be fixed	The writing system has been fixed

Table 7:- Suggestion and Enhancement Self efficacy Questionnaire

The self-efficacy questionnaire is used to measure the increase in self-efficacy of students. The self-efficacy questionnaire assessment includes the suitability of the format, language, and content. Based on the results of the assessment of 3 validators, the format conformity data obtained modus 4 with a very valid category and reliability of 89.5% with the reliable category. Language points in the self-efficacy questionnaire get modus 3 values with valid

categories and reliability of 89.5% with the reliable category. For the content format, get the modus value of 4 with a very valid category and 90.7% reliability with the reliable category. Thus the self-efficacy questionnaire developed was declared very valid and reliable.

D. Learning Outcomes Test Instrument Validation

The learning outcomes test instrument developed consisted of the pretest and post-test questions. The following is the result of the validation of the learning outcomes test instrument from three validators.

Description	Modus	Category	PoA (Average)(%)
Format	4	VV	88.8
Language	4	VV	86
Contents	4	VV	86

VV = Very Valid; PoA = Percentage of Agreement
Table 8:- Learning outcomes test instrument

Based on the results of validation by three validators in table 12, the data shows that in general the results of the learning outcome test validation are compiled with modus 4 with a very valid category and can be used with little revision. In addition, the reliability data of 87% also gives the meaning that the results of the validation tests of student learning outcomes are included in the category of reliability. Here are some suggestions for improvement of 3 validators.

Suggestion	Enhancement
There are several keys and cognitive domains that are not appropriate.	The answer key and cognitive domain have been adjusted
There are several uncorrect word and difficult to understand	The word has been correct and easy to understand.

Table 9:- Suggestion and Enhancement Learning outcomes test instrument

The student learning outcomes test instruments are composed consisting of 10 questions for the *pretest* and 10 questions for the *posttest*. Questions are arranged based on learning indicators, namely on acid base material. With the existence of cognitive processes *self-efficacy* students will appear to apply the various knowledge they have as well as to overcome the existing problems. In working on the problem, it takes strong *self-efficacy* in dealing with problems when working on questions and other demands. With high *self-efficacy*, a person will be able to set themselves to achieve the goals of the challenges that exist, and by using good analytical thinking able to show good performance when conducting tests [9]. S*elf-efficacy* possessed by students is able to have an impact on student achievement in accordance with the objectives to be achieved [10].

IV. CONCLUSSIONS

Based on the results of the research conducted, it can be concluded that the learning device developed using the learning cycle 9E model on acid base material is declared valid with a modus value of 4, and a reliability of 80% - 100% with a reliable category.

ACKNOWLEDGMENT

REFERENCES

[1]. Jamaldini, M., Baranzehi, H., Farajpour, N., dan Samavi, A. S. 2015. The causal relationship of *self efficacy*. *Self-concept,* and attitude towords mathematics with academic achievement in mathematics by meditation ofapproaches to learning. *International Journal of Review In Life Sciences.* 5(2): 41-45.

[2]. Erika, Farah., dan Praharani, B.K. 2017. Innovative Chemistry Learning Model to Improve Argumentation Skills and Self-Efficacy. IOSR Journal of Research and Method in Education (IOSR-JRME). Vol.7, 62-68.

[3]. Hairida & astuti M. W. 2012. Self-efficacy dan prestasi belajar siswa dalam pembelajaran IPA-kimia. Jurnal Pendidikan Matematika dan IPA, 3(1), 26-34.

[4]. Tehrani, I.A., Majid, M.A., Ghamari, M. 2014. Comparison of *self efficacy,* test anxiety and competitiveness between students oftop private schools and public schools. *Mediteran Journal of Social Sciences.* 5 (23): 2749-2754.

[5]. Thiagarajan, S., Semmel, D., S and Semmel, M., I. 1974. Instructional Development for Training Teachers of Expectional Children. Minneapolis: Leadership Training Institute/ Special Education, University of Minnesota

[6]. Riduwan 2012 Skala Pengukuran Variabel-variabel Penelitian (Bandung: Alfabeta)

[7]. Bandura, A. 1997. Self Efficacy; The Exercise of Control. New York: W.H. Freeman and Company.

[8]. Prastowo, A. 2015. Bahan Ajar Inovatif. Yogyakarta: Diva Press.

[9]. Bandura, A. 1994. Encyclopedia of human behavior. 4: 71-81. Tersedia pada http://www.uky.edu. Diakses 15 maret 2019.

[10]. Zimmerman. 2000. Self-Efficacy: An Essential Motive to Learn. Contemporary Educational Psychology. New York: Graduate School and University Center of City University of Newyork.