

Development of Scientific Based Integrated Learning Model

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Abstract—The application of an integrated learning model is an effort to organize independent learning material for students of primary school education. The model framework used in blended learning uses ICARE learning, namely Introduction, Connection, Application, Reflection, and Extension. The purpose of this study was to produce products in the form of integrated scientific learning models from the ICARE model and to find out student responses. This study uses a 4-D model, which includes stages including determining, designing, and disseminating stages. At the development stage, it consists of material and media expert validation, and development trials. Validation of material experts and media was consulted with material experts and media to obtain material content validation and graphic validation. In its development, the trial consisted of 14 small trials, and a large group trial consisting of 30 elementary school students (PGSD) - data collection techniques through documentation, questionnaires, and tests. Data analysis is done through qualitative and quantitative. Product testing was carried out at the Universitas PGRI Adi Buana Surabaya with excellent results. The integrated learning module is very good and suitable for use in PGSD students at the Universitas PGRI Adi Buana Surabaya.

Keywords—module; integrated learning; ICARE model

I. INTRODUCTION

The elementary school teacher education students can live properly in the community by their profession as teachers in elementary schools if students can develop their competencies comprehensively in a balance between soft skills and hard skills. They must have a strong foundation for the characteristics of learning in elementary school. They must demonstrate mastery and understand integrated learning because integrated learning is the main foundation for thematic learning in elementary schools. For this reason, efforts need to be made to develop learning teaching materials. Development of integrated learning teaching materials with a systematic design can provide meaningful experiences to students.

The student-centred module format is the design of teaching materials that are appropriate to the needs because they can be used independently and encourage students to learn to act. This module is a learning material systematically

designed based on a particular curriculum and packaged in the form of the smallest learning unit and allows it to be studied independently in certain time units [1,2] arranged in languages that are easily understood by students [3].

The flexibility of the ICARE model makes the design very interesting because it allows the course designer to change the student learning experience [4]. Modules are arranged using the teaching material framework, namely the ICARE model (Introduction, Connection, Application, Reflection, and Extension) that has a potential for structuring and organising course content. The introduction stage contains an explanation of the lesson objectives/session and what will achieve. In the connection phase, it connect new teaching materials with something that already known from previous learning or experience. The application stage, the learners work by themselves, to complete real activities or solve real problems using new information and skills that they have acquired. The relection is a summary of the lesson/session. The instructor needs to provide opportunities for participants to express what they have learned. The extension activity is called homework, includes the provision of additional reading material, research or training assignments.

II. METHOD

The approach of this research is a combination of qualitative-quantitative sequential exploratory models. This model combines sequential qualitative and quantitative approaches: a qualitative approach to uncovering the product development process and then a quantitative approach to uncovering the quality of development results, both in terms of products and their application. [4, 5]

The design of this study is a 4 – D model [5] which consists of four stages namely, define, design, develop, and disseminate at this defining stage, a module development needs will describe.

The design phase consists of two activities, namely the selection of the format and initial design of the integrated approach oriented scientific learning module through the ICARE model for the elementary school teacher education S1 Study Program. The development stage is to produce Scientific

Approach-oriented Integrated Learning products through the ICARE model for the elementary school teacher education S1 Study Program.

Draft 1 consulted with material and media experts. Selection 2, a small group trial consisting of 4 allied lecturers and 10 elementary school teacher education Surabaya undergraduate students tested. Draft 3 large group trials are consisting of 30 elementary school teacher education undergraduate students.

III. RESULTS AND DISCUSSION

This research produced a product in the form of a scientifically oriented integrated learning module through the ICARE model. Data obtained from the development stage.

A. The Process of Developing an Integrated Learning Module oriented to the Scientific Approach through the ICARE Learning Model

This development research includes three stages. These stages consist of the defining stage, the design stage, and the development stage. At the defining stage, namely; (1) integrated learning material is needed: (2) student characteristics are independent: (3) compiled integrated learning concept maps: (4) structured procedures for completing tasks; and (5) identified basic competencies related to integrated learning, namely understanding theory and designing integrated learning that must be mastered by students.

The design phase in this study produced a draft of a scientific-oriented and integrated learning module through the ICARE Learning Model (draft 1). While module development was carried out by writing self [3].

B. Quality of Integrated Learning Modules through the ICARE Learning Model Developed

Module quality in terms of products obtained from the results of validation by two people, namely material experts and expert graffiti.

Based on table 1, it can be specified that the contents of the ICARE Learning Model integrated learning module as a whole show that the average result of 3.73 can be categorized as Good. Details of the assessment include the assessment of the eligibility component with a score of 3.81 included in the Good category, then for the assessment of the language component, the assessment score of 3.77 is included in the Good category, and for the assessment, the presentation component is 3.58 Well. This means that it has met the feasibility of content.

The feasibility components of the contents of the development of the ICARE Model integrated learning module means that it has met the feasibility of the content of the material. The feasibility components include aspects of material coverage, material accuracy, updating, stimulating curiosity, developing life skills, and developing contextual insight. Material coverage means facts, concepts, principles, and procedures is in accordance with the basic material needs contained in the material with an easily understood form. Thus the students recognize ideas or ideas, identify ideas, explain the

characteristics of a concept or idea, can define, formulate formulas/rules, or construct new knowledge in accordance with Competency Standards (SK) and Basic Competencies (KD). Material accuracy means facts that are presented in accordance with reality and are efficient to improve students' understanding. Concepts must be presented accurately to avoid misconceptions by students. The aspect of module content proficiency can be seen in terms of the suitability of the contents of the module with the development of the knowledge, the updated features (examples), and the renewal of references. Stimulating curiosity means that it can stimulate the curiosity of the reader. Curiosity can be in the form of being aroused to read, critical thinking, the desire to try, think creatively, encourage readers to look for more information, etc. Meanwhile, the life skills include in this module are personal skills, social skills, and academic skills. Furthermore, contextual insights were developed through the presentations of examples, illustrations, drawings, etc. which were presented the concrete example from the environment.

TABLE I. RESULTS OF THE INTEGRATED LEARNING MODULE MATERIAL VALIDATION THROUGH THE ICARE LEARNING MODEL

No	Observed Aspects	Validator	Category
		Average	
1	Component of Feasibility to Fill		
	A. Coverage of Material	3.81	Good
	B. Accuracy of Material		
	C. Update		
	D. Stimulates curiosity		
	E. Develop Life Skills		
	F. Develop contextual insights		
2	Language Components		
	A. Conformity with the level of student development	3.77	Good
	B. Communicative		
	C. Dialogical and interactive		
	D. Straightforward		
	E. The comprehensive and thoughtful flow of thought		
	F. Conformity with Indonesian language rules		
G. Use of terms and symbols or symbols			
3	Presentation Component		
	A. Presentation techniques	3.58	Good
	B. Supporting the presentation of material		
	C. Presentation of learning		
Overall Average	3.73		

Rating Category:
 1.00 - 1.49: Not good
 1.50 - 2.49: Not good
 2.50 - 3.49: Good enough (valid)
 3.50 - 4.49: Good (valid)
 4.50 - 5.00: Very good (valid)

The use of language in modules is in accordance with the rules of Indonesian language, both spelling and grammar; and the use of terms and symbols is carried out consistently in accordance with the guidelines for term formation.

The aspect of learning presentation involves student involvement, student-centred, suitability of learning models with subject characteristics, and ability to stimulate the depth of student thinking through illustration and problem training.

C. Results of Media Expert Validation

Based on the results of calculations in table 2 that the results of Validation Aspects of Integrity Integrated Learning Module ICARE Learning Model show an overall average of 4.04 can be categorized as good, with details of the Module Size assessment showing a mean of 4.25 categorized good, for assessment Cover Design shows an average yield of 4.06 is categorized as good, and for the assessment of the Content Design the module shows a mean of 3.83 categorized as good.

TABLE II. RESULTS OF VALIDATION ASPECT OF INTEGRITY ICARE LEARNING MODEL INTEGRATED LEARNING MODULE

No	Observed Aspects	Validator	Category
		Average	
1	A. Module Size	4.25	Good
2	B. Cover Design	4.06	Good
3	C. Design of Module Content	3.83	Good
	Overall Average	4.04	Good

Rating Category:
 1.00 - 1.49: Not good 2.50 - 3.49: Good enough (valid)
 1.50 - 2.49: Not good 3.50 - 4.49: Good (valid)
 4.50 - 5.00: Very good (valid)

The validation by media experts covers the aspects of module size, cover design aspects, and design aspects of module content. Aspects of module size, indicate that the module meets the module size conformity requirements with ISO standards and conformity to the module content material. The cover design aspect has fulfilled the requirements for the appearance of layout elements on the front, back and back covers harmoniously and has a consistent rhythm and unity. Viewed from the design aspect, the module content shows that the module meets the requirements in terms of placement of layout elements consistent based on the pattern. Thus, in terms of content validation and graphic validation, it can be stated that it fulfils the feasibility for a standard integrated learning module. It can be stated that content validation meets the standard validity that has been set. In terms of appearance, based on the validator's assessment it can be stated that it has an attractive appearance format.

D. The Quality of Writing Modules Integrated Learning through ICARE's Learning Model Viewed from the Aspect of Implementation

The implementation of the development of Scientific Approach-oriented integrated learning module through the ICARE Learning Model in this study can be seen in the results of a small group trial consisting of 4 lecturers and 10 students as well as the results of a large group trial consisting of 30 undergraduate elementary school teacher education (PGSD) University of PGRI Adi Buana Surabaya.

1) *Quality of Readability Viewed from the Aspect of Implementation in Small Group Trials:* Based on the results of the readability assessment by prospective module users from the lecturer circles in the small group trials, the average score of 3.78 was included in the Good category. Whereas from the student group, the average score of 3.89 was included in the Good category (Table 3).

Furthermore, overall the module readability value is obtained by the average result of the value of 3.83 including the Good category. This shows that the quality of the module developed is feasible to implement. The ten aspects of readability each get readability values in the Good category. Thus the overall value of the readability of the integrated learning module through the ICARE Learning Model developed includes the Good category.

TABLE III. READABILITY ASSESSMENT OF INTEGRATED LEARNING MODULES THROUGH THE ICARE LEARNING MODEL BY LECTURERS AND STUDENTS

No	Rated aspect	Average Score		Final Average
		Lecturer	college student	
	The material is arranged systematically and logically.	4	4.2	4.1
	Using a writing style that is easy to digest and readable	3.62	3.7	3.66
	Use good and correct Indonesian.	3.5	3.5	3.5
	Using Indonesian that is easy to understand	3.87	4	3.93
	Demonstrate learning experiences that can activate readers	4	4.4	4.2
	Interesting and stimulating curiosity.	3.5	3.7	3.6
	The contents of the presentation support character education	3.87	3.5	3.68
	The contents of the material are presented contextually	3.5	3.6	3.55
	Ada contoh dan ilustrasi (berupa benda, angka, gambar, grafik, bagan, diagram, tabel, dsb.)	4	4.5	4.25
	Examples and illustrations make it easy to understand and support material descriptions.	4	3.8	3.9
	Average	3.78	3.89	3.83

Rating Category:
 1.00 - 1.49: Not good 2.50 - 3.49: Good enough (valid)
 1.50 - 2.49: Not good 3.50 - 4.49: Good (valid)
 4.50 - 5.00: Very good (valid)

2) *Judging from the Aspect of Implementation in Large Group Trials:* After the draft of 3 Integrated Learning modules through the ICARE Learning Model, the module was implemented in learning through a large group trial consisting of 30 students. Based on the results of the large group trial data obtained the average value of learning outcomes per learning activity, is 80.7 with the Good category (Table 4).

Furthermore, the average learning outcomes per student can be grouped into two categories, namely the excellent category achieved by 13 students and the Good category achieved by 17 students. The average value of learning outcomes per student is 80.7 with the Good category.

The two mean learning outcomes indicate that the implementation of the Integrated Learning Module through the ICARE Learning Model has an impact on the acquisition of student learning outcomes. The impact of obtaining these learning outcomes is included in the Good category. This shows that integrated learning modules, namely individual skills expressing ideas, thoughts, feelings, opinions, desires, and / or experiences through written language media into

creation in the form of integrated learning that meets the criteria of novelty and utility, which is relatively difficult, can be mastered well by students through the Scientific Oriented Integrated Learning module through the ICARE Learning model.

TABLE IV. TEST RESULTS OF THE APPLICATION OF INTEGRATED LEARNING MODULES THROUGH THE ICARE LEARNING MODEL

No	Name	KB 1	KB 2	KB 3	KB 4	Average Value
1	N	80	85	70	85	80
2	AA	80	80	75	85	80
3	WMS	85	85	70	90	82.5
4	DL	75	70	65	85	73.75
5	SN	85	75	70	80	77.5
6	RAL	90	90	75	85	85
7	DYW.	75	85	60	85	76.25
8	DY	90	90	65	90	83.75
9	FT	80	85	70	85	80
10	FD	85	90	75	90	85
11	IS	90	90	80	90	87.5
12	DBR.	80	80	65	85	77.5
13	SS	75	85	70	80	77.5
14	MDE.	90	90	85	80	86.25
15	LA	75	70	60	85	72.5
16	VRS.	90	85	75	90	85
17	YDA	80	85	65	75	76.25
18	ZI	80	90	80	85	83.75
19	CN.	80	75	65	85	76.25
20	UF	75	85	65	75	75
21	IKN.	80	85	75	85	81.25
22	ABB.	85	80	60	85	77.5
23	AWT	80	85	75	75	78.75
24	NQ	90	85	85	90	87.5
25	DO	75	80	65	85	73.75
26	EWG.	80	90	75	85	82.5
27	WRF.	80	90	70	85	81.25
28	LS	85	70	80	75	77.5
29	DK	75	85	60	85	76.25
30	DNF.	85	90	75	90	85
Average Value		81.83	83.66	73	84.33	80.7

ICARE's learning model contributes to solving the problem of creativity which is considered a complicated phenomenon. The research of Maskur et al. is titled "Mathematics Learning with ICARE's Strategy of Constructivism to Improve Three Dimensional Material Creative Thinking Abilities". His research results showed: (1) the average score of SP, RPP, LKS, MS, and TKBK more than 4.00 showed valid criteria, (2) responses of students and teachers to components and positive learning activities, (3) learning mathematics with ICARE's strategy refers to effective constructivism [6]. Furthermore, the results of this study also prove and strengthen previous research that the ICARE learning model can improve mastery of learning material [7] "ICARE Learning Model in ICT Curriculum Subjects in Middle School". The results of his research show that the ICT learning model through the ICARE

model provides positive effects and can be developed into more meaningful and enjoyable learning.

IV. CONCLUSION

From the explanation above, it can be concluded that based on the results of material validation and graphic validation it can be stated that the integrated learning module through the ICARE Learning Model as a whole is feasible to be used as an independent learning material for integrated learning subjects in PGSD students. This can be proven from the Quality of Integrated Learning Modules Viewed from the Product Aspect with categories; Aspects of Feasibility of Content, Language Aspects, and Aspects the presentation which showed a mean of 3.73 was included in the good category. These results are in line with the criteria for writing textbooks from the Standard Assessment of Textbooks by the BSNP which include the feasibility of content, the feasibility of presentation, and the feasibility of using the language. Validation of graphic aspects which shows a mean of 4.04 including good categories, in terms of appearance, based on the validator's assessment can be stated to have an attractive appearance format. These results are in accordance with the graphical quality criteria of the Standards for Assessment of Textbook Books by the BSNP which cover aspects of module size, module cover design, and module content design. In terms of this application, the readability aspects obtained through small group trials showed that the quality of the module readability included the Good category with an average of 3.83 and the quality of implementation carried out through large group trials indicating that the implementation activities included the Good category, with a mean of each activity is 80.7. The results of this study prove and reinforce previous research that the application of the ICARE learning model has a contribution to solving the problem of creativity

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