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The Development of Learning Materials of Online Probing-Prompting Method at IAIN Antasari in Indonesia

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Ani Cahyadi

Institut Agama Islam Antasari, Indonesia

E-mail: anichahyadi@gmail.com

Abstract: The learning materials based on independent learning and constructivism for students especially online probing-prompting method has not been developed yet in the learning process at IAIN Antasari. The purposes of this study are to develop the learning materials of online probing prompting method including the syllabus, lesson units, instructional materials, student assessment sheet, learning media, and online learning design which have been validated by the experts. It is also aimed to identify the quality of the learning materials based on the experts' assessment. This study used research and development (R & D) approach. The finding of the study showed that IAIN Antasari has developed the learning materials of online probing prompting method including the syllabus, lesson units, instructional materials, student assessment sheet, learning media, and online learning design. The study also found that the experts' assessment on the quality of the learning materials of online probing prompting method at IAIN Antasari was quite good in terms of the feasibility aspects of the materials, presentation, language and images.

Keywords: Learning materials, material development, probing-prompting method.

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INTRODUCTION

The Law number 20 of 2003 and the Government Regulation number 19 of 2005 have stated that the trend of higher education policy puts emphasis on the quality and the public accountability of the higher institutions. Moreover, the quality of the institutions becomes an important point on the implementation of the institutional accreditation on Accreditation of Higher institutions (AIPT) in the Law No.12 of 2012.

The institutional accreditation is a process that is used by an authorized institution to acknowledge formally that an institution has the ability to perform activities in accordance with the work program that has been formulated. In the accreditation, an institution receives the government juridical recognition related to the quality, efficiency, and relevancy of the institution's management. It means that the accreditation status is considered very important for the institution. The learning process becomes an important point in the accreditation and is included in the standard 5 (curriculum standard). In other words, the learning process

should be one of the priorities needed to be upgraded in order to support the accreditation process.

The State Institute for Islamic Studies (IAIN) Antasari is one of the higher institutions under the Ministry of Religious Affairs (MORA). It has been explained in the Statute of IAIN Antasari in Article No. 25 that the IAIN Antasari has four faculties namely Faculty of Tarbiyah and Teaching Training, Faculty of Sharia and Islamic Economics, Faculty of Islamic Theology and Humanities, and Faculty of Da'wah and Communication.

The faculties carries out a substantial mandate in educating the students in order to produce graduates who are ready to compete internationally as educators as well as other roles. Therefore, there needs to be a way for the students of IAIN Antasari to be qualified graduates.

One way to prepare the students is through a good learning system which leads them to become independent learners. According to Gagne (Jonassen, 2000), the center of education is to teach the students to think. The rational thinking process is used as a better problem solver. In addition, Jonassen (2000) states that independent learning is a process to promote the students to perform independent actions involving both individuals and groups. Moreover, Hui & Umar (2011) state that independent learning is a process involving the students to set their learning goals. To conclude, from the above definitions, independent learning is very important for students and this self-learning is very much supported by network accessibility or online.

According to Wagner, Hassanein, & Head (2008), online learning is defined as an instructional content or a learning experience delivered via electronic technology. The advantages of using online learning are: the students can be independent, have high motivation, and commitment in learning. The increasing number of virtual learning makes

online approach necessary to be used in the education process. In addition to online learning, it is also useful to provide suitable learning methods to encourage the students to construct their own thinking. The learning method that can be used to accomplish this goal is probing-prompting method. Probing-prompting is a process of learning by presenting questions to guide and explore the students' knowledge, as described by Suherman & Mahendra (2001) that probing is the investigation and examination, while prompting is pushed or guided. Probing-prompting based learning is a form of learning that presents a series of guided questions and explores the students' ideas so that the students can associate their prior knowledge and experiences with a new knowledge that is being studied.

Probing-prompting method has two students' activities which include thinking activity and physical activity (Johnson, 2007; Suherman & Mahendra, 2001). The lecturer activities in probing-prompting method build the students' knowledge and help them by using a number of questions that require lower and higher order thinking process.

Based on the theories of the online learning and probing-prompting method, it is necessary to develop the learning materials which promote the independent learning and the ability to construct the students' knowledge. The development of the learning materials is directed to the designing of the learning plans by using a variety of learning approaches so that the learning goals can be achieved. The development of the online probing-prompting based learning design will also support the preparation of the 2013 curriculum. The 2013 curriculum focuses on the learning process that directs students to actively discover the concept, while probing-prompting method begins with a series of questions to guide the students in finding the concept of what is learned, so that the development of probing-prompting-based learning design is beneficial to support the implementation of the 2013 curriculum. The learning materials developed include the

syllabus, teaching units, instructional materials, Student Assessment Sheet, learning media, and online learning materials which have been validated by the experts.

The results of this study can be utilized by the department / study program in an effort to equip the lecturers as the educators who have the integrity and competitiveness in accordance with the vision and missions of IAIN Antasari.

Departing from the discussion above, the research problems of this study are then formulated as follows: (1) what are the online learning material components of probing-prompting method that will be developed? (2) How is the quality of the learning materials based on the experts' assessment?

This study aims to 1) produce the learning materials of probing prompting method in the form of syllabus, learning units, instructional materials, Student Assessment Sheet, learning media, and online learning design which have been validated by the experts, and 2) identify the quality of the learning materials based on the experts' assessment.

The significances of this study are (1) as the study material in the framework of the department development at IAIN Antasari; (2) as a guideline of learning material development for lecturers; (3) as a valuable input for IAIN Antasari in the policy-making related to the learning process; (4) as one of the accreditation documents of IAIN Antasari both for the institution and study program level; and (5) as a document of Primary School Teacher Education Department (PGMI) which can be used in the learning guideline.

METHOD

This study used Research and Development (R&D) model as the research design (Bozeman & Melkers, 2013). The products to be developed are the learning materials of online probing-prompting method comprising the syllabus, teaching units, instructional materials, Student Assessment Sheet, learning media, and online learning design as validated by the experts. The development model used in this study was adapted from the 4D model; definitions, design, develop, and disseminate. Here is the overview of the study figure 1.

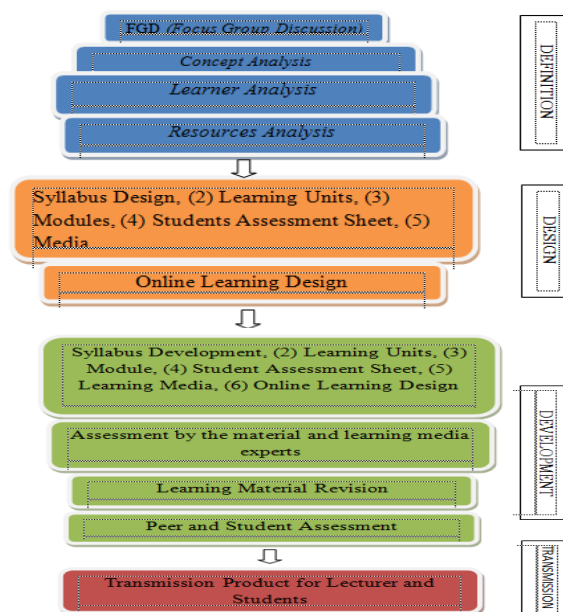


Figure 1. Learning Design Development by Using the 4D Development Model (Adapted from Thiagarajan, Semmel, & Semmel, in *Instructional Development for Training Teachers of Expectional Children*, 1974)

The subjects of this study are the lecturers and students of the learning design course. The objects of this study are the learning materials: the syllabus, teaching units, instructional materials, student assessment sheet, learning media, and online learning design which has been validated by the experts.

The questionnaire and documentation were used as the research instruments to obtain the data needed in this study. The data analysis techniques used were content analysis and quantitative descriptive.

Based on the research problems and the stages of the development model above, the results of the study are presented as follow:

Definition Phase (Define)

In this phase, the FGD (Focus Group Discussion), the discussion of experts, was used as the method of collecting the data. The research team brought the draft materials to be discussed, and then the draft was discussed in the focus group. The result of the FGD has become important data in this study. The participants were the lecturers from the Department of Mathematics Education, the representatives of the Department of Primary Education, e-learning trainers of IAIN Antasari, the students, and the research team. Three points that were discussed in this stage are related to:

a. Concept Analysis

Concept analysis is a review of the basic concepts that will be taught. The learning materials of online probing-prompting method that will be developed are for the Basic Arithmetic course.

The discussion result showed that the descriptions of introductory questions in the Integer chapter related to the polar regions' temperature needed to be simplified and replaced by the body temperature or the temperature of boiling

water; replacing the indicators of learning achievement with the operational words, for example, the word "understand" is substituted by the word "explain"; and it is required to provide an instructional manual on the use of online probing-prompting method.

b. Learner Analysis

The learner analysis in this study is an analysis of the students' characteristics in accordance with the design of the learning material development according to the online probing prompting method. The students' characteristics include academic skill background (knowledge), students' cognitive development, and individual or social skills associated with the study of learning, instructional media, the selection of formats and languages. The learner analysis is needed in order to figure out the student characteristics; (1) the level of ability or intellectual development of the students, and (2) the individual or social skills already acquired by the students which can be developed to achieve the learning objectives.

The result showed that: (1) many students in the Primary Education department came from non-science major background; therefore, they lacked ability to calculate well; (2) there were a number of students who came from the remote areas, thus their good local knowledge; (3) the local languages still dominated the conversation in the classroom; (4) some students still did not have email addresses, and some of them forgot their own emails; and (5) their literacy to access the internet with regard to the learning was still lacking.

c. Resources Analysis

Resources analysis is a review of the main concepts that will be taught which includes the themes that will be developed such as (1) Roman, Decimal, and Binary Numerals, (2) Natural Number, (3) Whole Number, (4) Integers, (5) Fraction

Number, Rational Number and Irrational Number, (6) Real Number, (7) Exponential Number and the roots, (8) Prime Number and Composites Number, (9) Greatest Common Divisor (FPB), (10) Least Common Multiple (KPK), and (11) Social Arithmetics.

Design Phase (Design)

The design phase aimed to design the learning materials of online probing-prompting method. This design was based on the results of focus group discussions on the definition phase. The initial drafts of the define phase i.e. syllabus, learning units, and modules still had many shortcomings; therefore they needed to be redesigned to correspond to the learning objectives. Thus, in this stage the learning materials in the form of: (1) Syllabus, (2) Learning Units, (3) Books / Module, (4) Student Assessment Sheet, (5) instructional media, and (6) online learning were designed based on the input of phase 1. The design of online learning will then be accessed and promoted to the students via online.

Development Phase (Develop)

The third step was the development phase. The development phase produced the learning materials of online probing-prompting method. At this phase, there were two stages: (1) the assessment of the learning material and media experts as well as the revision of the results of the assessment, and (2) the development trials.

The assessment of the material experts aimed to obtain the input from the experts in order to get the material feasibility. Meanwhile, the assessment of the learning media experts aimed to obtain the input from the experts on the learning instructional technology in order to gain the feasibility of the presentation, language and image aspects. The development trials were conducted by their colleagues and students. The purpose of this step was to obtain direct input in the form of responses, reactions, the students' and the

observers' comments toward the learning materials of online probing prompting method which have been prepared.

Dissemination Phase (Disseminate)

Dissemination was the final stage of the development process. This phase was done to promote the development of the products to be acceptable by the users. The users were categorized as an individual, a group, or a system. Due to the fact that basic arithmetic course has not been taught yet in the department of Primary Education of IAIN Antasari, the dissemination could not be done in a class to determine the effectiveness of the use of the learning materials in the learning process. Therefore, the dissemination step was done through the process of transmission to some practitioners and students.

RESULT AND DISCUSSION

The result of the study in detail is described in the following:

The Result of the Material Experts' Assessment

The result is described in the table below.

Table 1. The Result of the Material Experts' Assessment

Assessment Aspect	Total Score	Mean Score	Category
Material Feasibility	38	3.5	Good

The Result of the Learning Media Experts' Assessment

The result is described in the following table.

Table 2. The Result of the Learning Media Experts' Assessment

No	Assessment Aspect	Total Score	Mean Score	Category
1	Feasibility of Presentation	77	4.1	Good
2	Feasibility of Language and Images	20	4.0	Good

The Result of Peer Assessment

The result is described in the following table.

Tabel 3.The Result of Peer Assessment

No	Assessment Aspect	Peers	Total Score	Mean Score	Total Mean Score	Category
1	Material Feasibility	1	48	4.4	4.0	Good
		2	44	4.0		
		3	39	3.5		
2	Feasibility of Presentation	1	89	4.7	4.5	Very Good
		2	85	4.5		
		3	81	4.3		
3	Feasibility of Language and Images	1	20	4.0	4.2	Good
		2	21	4.2		
		3	22	4.4		

The Result of Student Assessment

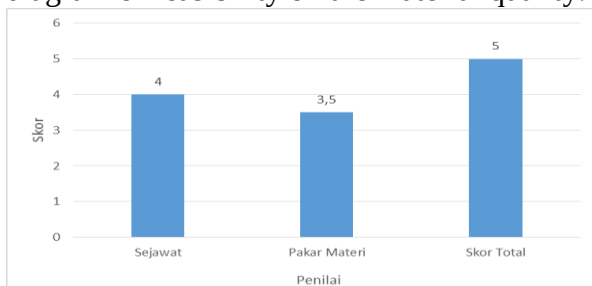
The result is described in the following table.

Table 4
The Result of Student Assessment

Assessment Aspect	Student	Total Score	Mean Score	Total Mean Score	Category
Legibility Aspect	1	75	4.4	4.5	Good
	2	71	4.2		
	3	65	3.8		
	4	59	3.5		

Analysis of the Material Feasibility

The assessment of learning materials of the online probing-prompting method shows that the *mean* score obtained from the experts is 3.5 and from the peers gained an average of 4.0 respectively in the “good” category. The following Figure 2 is the diagram of feasibility on the material quality.



Based on the assessment of the learning materials of online probing prompting method, it is known that the presentation aspect of the learning media experts' assessment obtained a score of 4.1 in the “good” category, and it got a “very good”

category from colleagues with a score of 4.5. The following image is the diagram presenting a presentation feasibility based on the learning media experts' and peer assessment.

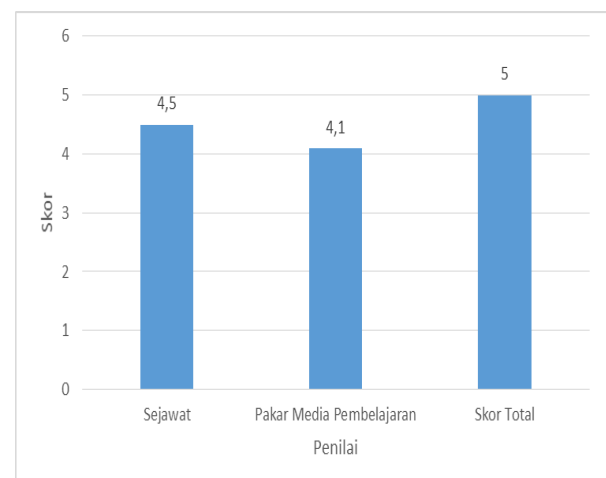


Figure 3. Diagram of Presentation Feasibility based on the Learning Media Experts' and Peer Assessment

Based on the assessment of the learning materials of online probing prompting method regarding the aspects of language and images, it is identified that the experts of instructional media put a score of 4.0 and colleagues gave a score of 4.2 in the “good” category. The following image is the diagram of the feasibility of the language and images based on the learning media experts’ and peer assessment.

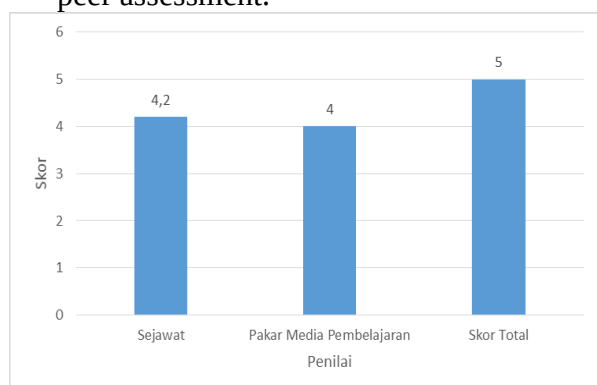


Figure 4. Diagram of Feasibility of Language and Images based on the Learning Media Experts’ and Peer Assessment

Analysis of the Legibility Aspect

The legibility aspect is the students’ response on the learning materials of online probing prompting method that have been developed. Based on the students’ assessment, it obtained a score of 4 in the “good” category. These students were the students who had been taught two courses of mathematics education in which the content materials were mainly the same with the basic arithmetic course.

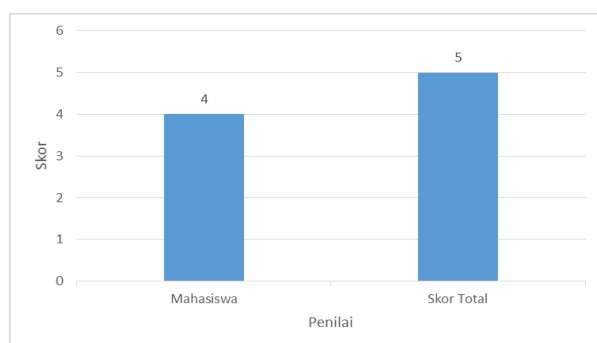


Figure 5. Diagram of Students’ Legibility

Here is the revision of the learning materials of the input from the material experts, namely:

- The achievement of syllabus and lesson plan in accomplishing the materials in a semester will not be completed, let alone if the students are given additional tasks during lectures, so the lesson plan needs to be adjusted in terms of the achievement indicators.
- The students’ worksheet should provide the materials and sample questions related to the problems stated in the worksheet, e.g. multiplication and division operation rules, formulas and principles of math operations on various numbers.
- Additional step processing with pattern rules should be provided on the types of math word problems: (1) what is known and what is being asked, (2) the formula used to solve the problem, (3) analysis and simplification, and (4) summarize and examine the results.

The input obtained from the instructional media experts relating to the presentation, language and images aspect includes (a) it would be much better to provide a glossary at the beginning part of the text in order to help the students understands several difficult specific terms, (b) lay out of the teaching materials should be revised, (c) the cover of teaching materials should be more attractive.

Peers’ feedback relating to the aspects of material, presentation, language and images includes (a) the linking words used in sentences should be revised, (b) leaving a space between the sub-chapter, (c) there are some words that should be corrected, e.g. the word “*sebalah*” should be replaced with “*sebelah*”, (d) in the chapter of fractions, one additional indicator regarding the difference of fraction and rational numbers should be included, and (e) providing additional information on the topic of “numerator and denominator” to facilitate the students in understanding the context.

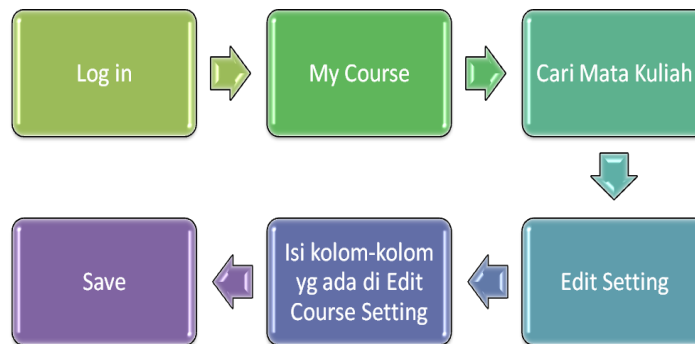


Figure 6: The Flowchart of Course Setting

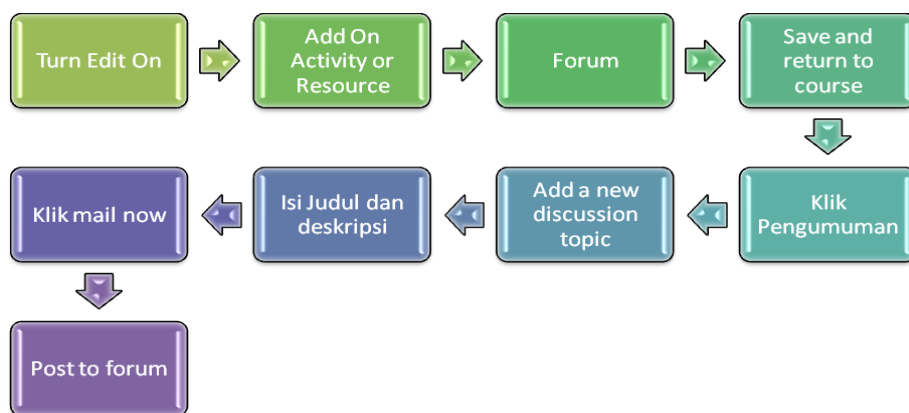


Figure 7: The Flowchart of Course Announcement

Guidelines for the Use of the Learning Materials of Online Probing-Prompting Method

There are two guidelines for the use of the learning materials of online Probing Prompting method for teachers and students guidance.

1. Guidelines for students

Here are some brief guidelines for students in using the learning materials of online probing-prompting method:

- The students must have an email account. If they do not have an email account then they have to create one.
- The students log in to the website address "elearning.iain-antasari.ac.id"
- Clicks create new account, and then fill in the form in accordance with the students' own specific information and current active email address. The

red marked part should be filled in and then click create my new account.

- Open the email address, then look for incoming messages from the super admin and open the emails.
- Look for the subject, namely basic arithmetic, then choose according to the students' own purposes, e.g. access/ download the materials in the form of PowerPoint in every meeting, or download other learning materials.
- Interact with the lecturers

2. Guidelines for the lecturers'

- Make sure the lecturers have an active email account.
- Log in to web address "elearning.iain-antasari.ac.id."
- Click create new account, and then then fill in the form in accordance with the lecturers' own specific information and current active email

address. The red marked part should be filled in and then click create my new account.

- d. Open the email address, then look for incoming messages from the super admin and open the emails.
- e. Next please click on the email address that is printed in blue on incoming mail messages.
- f. Register a new account that has been confirmed.
- g. Click on "courses" to continue
- h. For setting up the courses please select menu log in> my course> find subjects> edit settings> fill in the provided columns in the edit course settings> select save. Here is a picture of the workflow in setting up the course.

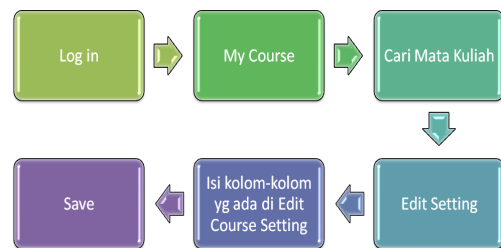


Figure 6. The Flow Chart of Course Setting

- i. To make the announcement board (topic online), the lecturers will need to turn edit on> add on activity or resource> save and return to course> click *announcement*> add a new discussion topic> fill in the titles and descriptions> click *mail now*> post to forum. Here is a picture of the workflow to create a bulletin board.

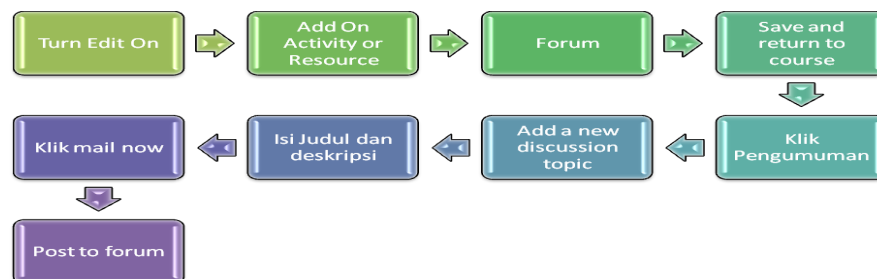


Figure 7. The Flow Chart of Creating a Bulletin Board

- j. Create a group and setting student enrollment.
 - 1) Enable self-enrollment by choosing the course administration> user
 - 2) Create a group / class parallel by selecting *course administration*> user.
 - 3) Enable self-enrollment by clicking the user> enrollment method.
- k. Create a discussion forum / chat
 - 1) Type *Turn editing* on the upper side or next to the left
 - 2) First create a Discussion Forum (in the column where the Forum will be installed)> click *Add an activity*.
 - 3) In the column *Forum name*, please click the Discussion Forum.
 - 4) In the column Description, type for example: "This page is a student discussion forum on basic arithmetic courses".
 - 5) On *Subscription mode*, please select the *forced subscription*.
 - 6) Then click *save return to course* or *Save and display*.
 - 7) Left alone the other setting without any changes.
 - 8) The next step, click the Discussion Forum that has just created.
 - 9) The new Discussion Forum has been created.
 - 10) To attach the material / subject of discussion please click *Add a new discussion topic*
 - 11) In the *subject* column, please type the theme / discussion title.

- 12) In the *message* column, type the subject of discussion.
 - 13) If a file attachment is required, please click *Attachment* and then click *Add*, and then locate the file that is stored in a laptop to upload.
 - 14) To make sure that the material is accessible to students, please make sure to click *mail now* by clicking the box mark on the right.
 - 15) Then click *Post to forum*. As a result, the material is posted and accessible at the same (read and commented upon) by the students.
- I. Create and Upload the Content,
- 1) On the Home menu, click the "My Courses".
 - 2) Select and click the subjects of teaching
 - 3) Turn on the edit function by clicking until the "turn editing off" appear
 - 4) Input the lecture materials by clicking on "add an activity or resource".
 - 5) Select "file" to include the materials in the form of files
 - 6) After the "file" is selected, and then click "add"
 - 7) Make sure to type the file name in the "name" column
 - 8) Describe briefly the contents of the uploaded file in the "description"
 - 9) Drag the file from where you save the file to the "content" column that has been provided
 - 10) Make sure the uploaded file already exists in the appropriate column
 - 11) If the browser does not provide the "file retrieving" feature, then do it manually by clicking the "add" on one of the symbols
 - 12) Find the file that is wanted to download by clicking "browse"
 - 13) Then upload the file by clicking "upload this file"
 - 14) Make sure the uploaded file already exists in the appropriate column
 - 15) Save and return to the settings menu by clicking the "save and return to course"

The results of the above analysis correlate with the research problems which explain two fundamental points: (1) what are the learning material components of online probing-prompting method that will be developer; and (2) how is the quality of learning materials based on the experts' assessment.

On the first point, scientifically through focus group discussion, assessment and validation of the experts, it was found that the learning materials that needed to be developed consisted of a syllabus, learning units, teaching materials, Student Assessment Sheet, learning media, and online learning design. The components of developed learning materials were adjusted to the participants' needs. A study should emphasize on validity, practicality and feasibility (Hannafin, Land, & Oliver, 1999) in order to obtain the independent learning as one of the learning goals of probing prompting method. This study focused on the validity and eligibility criteria. The practicality was not completely fulfilled due to the main reason that the learning materials have not been tested in the field. The learning materials were only tested on a limited basis. In a study conducted by Chandler (2003), this study was similar in terms of adapting the 4D model development, namely define (definition), design (design), develop (development) and disseminate (dissemination).

It is noted that the results of this study are not fully in line with the statement of Louis Cohen et al (2010) which state that the technique of probing-prompting is used to pursue an issue in more depth. In fact, this technique can also actually be used to establish and promote the students' independent learning.

Another finding that can be linked is a study conducted by Tomlinson (2012). Their study used similar development model namely 4D models. The only difference is that they used a different step order. Tomlinson (2011, 2012) only run two steps, namely the learning material development and testing phase. The criteria used was only limited to the validity, practicality and effectiveness. However, the effectiveness benchmark used in this study was in line with the feasibility aspect used in our study. Therefore, there is no difference in both studies.

On the other hand, the theoretical development is needed to strengthen the scientific principle of the epistemology axiology. Thus, ideally the development method can also be improved by using a theoretical development model that describes the thinking framework based on theories that are relevant and supported by empirical data. Similar concept is explicitly mentioned by (Hidayati & Listyani, 2010). In other words, the validation and reliability testing become important aspects to produce the learning instrument through: 1) the theoretical study related to the output-outcome of the probing-prompting method; 2) the series of item composition of learning instruments; and 3) the test-analysis-revision and formulation of the final learning instrument.

Interpretation, as in general research development, toward the data obtained should necessarily be based on the data and facts obtained in the field. According to Richey & Klein (2014), this study has been conducted to generate knowledge based on the systematic data that were derived from practicality. The interpretation is also enriched with theories as its theoretical orientation. The results of the development Research, of course, lead to the development of the research object.

This study developed the learning material of online Probing Prompting Method at IAIN Antasari Banjarmasin. The development of the learning materials of

online probing- prompting method, as far as the investigators concerned, was still very limited and rarely disclosed. However, as stated by Ally, 2004; Curtis & Lawson, 2001; Kruse, 2004 in online learning there are seven components that should be observed: subject, object, tools, norms, community, division of labor, and outcome. Because of the different research focuses, seven of these components cannot be analyzed thoroughly in this development research.

Thus, the first objective of this research has been achieved by accomplishing the learning materials of online probing-prompting method. The second objective to determine the quality of the learning material based on the experts' assessment can be seen from how they assessed the value of the feasibility aspect of the material, presentation, language and images. This feasibility aspect is what distinguishes this study from several other findings (Abu Rass, 2010; Hidayati & Listyani, 2010).

CONCLUSIONS AND RECOMMENDATIONS

Based on the analysis and discussion above, it can be concluded the learning materials of online probing-prompting method at IAIN Antasari have been designed consisting of Syllabus, learning units, instructional materials, Student Assessment Sheet, learning media, and online learning design.

The quality of the learning materials of online probing prompting method at IAIN Antasari based on the experts' assessment of learning materials and media has been in "good" category in terms of the feasibility of material, presentation, and language and image aspect.

The learning materials are very useful for the department, so that it is important to develop the learning materials of online probing-prompting method for the other course subjects and majors. The learning materials of online probing prompting method

have not been tested in the classroom, so that it is important to experiment this method during the learning process in the classroom.

It is important to conduct more similar studies related to the development of learning materials so that there is improvement in the quality of learning and curriculum.

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