Teaching Material Development 0f Learning and Teaching Course Through Lesson Study Application for University Students

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Abstract: The purposes of this development are to (1) create valid, interesting, practical and effective teaching material products for learning and teaching course; (2) to apply an approach of Dick and Carey model system in a teaching material for Learning and Teaching course; (3) implement descriptive learning theory and prescriptive learning theory in Bahasa Indonesia teaching and learning at Junior High School, Senior High School and Vocational High School; and (4) apply lesson study as a learning model for Learning and Teaching course. The data was collected using product validation questionnaire by content experts, language experts, and design experts as well as university student response questionnaire to obtain data on the aspects of attractiveness, practicality and product effectiveness developed. The data was analyzed by using descriptive statistic and t-test with assistance of SSPS *for windows* version 22,0 program. The research results are that (1) the validation by content experts, language experts, and design experts obtained very valid criteria, (91%); (2) the design of teaching material prepared by an approach of Dick and Carey model system tested in extensive field and analyzed through descriptive statistic obtained very practical criteria (93%); (3) the implementation of teaching and learning theory in the Bahasa Indonesia subject at Junior High School, Senior High School and Vocational High School extensive field and analyzed through descriptive statistic obtained very practical criteria (97%), as well as the application of *lesson study* as learning model and analyzed through descriptive statistic obtained very effective criteria (83%). Results of t-test with assistance of SSPS *for windows* version 22,0 program showed the significant increase of learning outcomes in experimental group using the products, namely 0.000<0,05. Results of the development could be disseminated in all Department / Study Program in LPTK FKIP Undana because the teaching and learning theory is a formal shield for fulfillment of pedagogical and professional competencies for university students as prospective leaner teachers. The product development is directed to accommodate the language learning for prospective teachers with early age and elementary school children as the learners.

Keywords: learning, teaching, leaner teachers, implementation, lesson study.

Learning and Teaching and is a course covering overall course with characteristic of Faculty and Study Program competencies. A number of descriptive theories giving base for learning, in particular is the first foundation for university students of Senior High School and Vocational High School graduations choosing LPTK as their life breeding in the future. As the main axis for learning leading to the learning achievement of prospective leaner teachers, this subject obtains less important portion. Theoretical- informative pure sciences are still the superstars in LPTK which should be led pragmatically-applicative studies presented by this subject. The development purpose is to create valid, interesting, practical and effective teaching material products. The teaching material products are designed with properties of pragmatically-applicative to improve university students' abilities, as the prospective learner teachers of Bahasa Indonesia in Junior High School, Senior High School and Vocational High School.

Using an approach of Dick and Carey (2015) model system, the teaching material products have specification on the implementation of prescriptive learning theory (Bruner, 1884 in Gredler, 1991 and Degeng, 2012) through the application of *lesson study*. Selection of learning strategy in order to maintain applicative competencies for learner teachers is still dominated by a model having the core at the lecturers. The students as Z generation and born in digital era, require collaborative digital learning atmosphere, and not the individual one; this leads the students to find out problems and then solve the problems with their networks, not that they are given problems and solved them by lecturing from the lecturers.

Lesson study is developed as learning model, therefore its characteristics are collaborative, contextual and simulative, as well as looking for, finding out, and solving problems in learning groups. *Lesson study* that was initiated by (Lewwis and Perry (2012) focuses on the learning, however also improves learning quality conducted by the teachers so that this can effect on the students' learning outcomes. The lesson study activity is used to conduct initial and extensive field tests to measure product effectiveness aspects. In its implementation, the developers did not only present the learning in the nuance of lesson study, but also based on the small group discussion as a formation of learning community. Squire (2010) defined the learning community "as groups of teachers who continually inquire into their practice and, as a result, discover, create, and negotiate new meanings that improve their practice". The important issues expressed by this limits are continually inquiring, discovering, creating, and negotiating new meanings to be applied in the learning. Squire (2010) then stated that through the learning community, the teachers (including the students as prospective teachers) will be very qualified in the case of: (1) making connection of gaps among theories in campus and practice at school; (2) creating room to discuss problems in learning implementation practices; (3) improving retention of learner teachers; (4) sustaining pedagogical practice and theoretical concept of sciences; (5) guiding transformative learning; and (6) improving students' learning.

Then Widjayanti (without year) described stages of lesson study namely: plan: learning activity from teaching, do: learning activity concerning teaching, and see: learning activity for teaching. In the plan stage, the students conducted learning process concerning the unit learning that was being discussed. It was conducted by noting personal weakness and superiorities, hearing at group member weakness and superiorities, sharing opinions about each weakness and superiorities.

In the *do* stage, the students decided to select any problems considered to be urgent to understand in general concerning the materials to be discussed. The urgent problems are presented in class discussion. Each group proposed one problem considered to be urgent concerning the materials to be discussed, so that it could be the moment to learn about teaching.

In the *see* stage, along with the advisor lecturers, the stage learning for learning substantively discussed important issues that could be understood and could not be understood by the students. The three stages of lesson study that were conducted continually provide easiness for the students to understand didactical, methodical and psychological aspects as pedagogical profession for prospective teachers.

METHODS

Development Model

The development model uses a system approach initiated by Dick and Carey (2015) through 10 inter-connected steps with the purposes to: identify and observe various things related to the products developed; develop products based on initial study findings; validate

products; test product to be used in learning through natural setting; and conduct revision based on validation and field trial results. One of the development contributions is to provide teaching material with lesson study application to bridge gaps between research results and practice (Setyosari, 2007 in Adi, 2010).

The development of teaching materials follow Dick and Carey (2015) model outlining on the following teaching material criteria: (1) attractive, (2) content well-adjusted to special purposes of learning, (3) well-ordered, (4) having guidelines of teaching material use, (5) having practical questions, (6) having practical answers, (7) having tests, (8) having guidelines of leaners' progress, and (9) having guidelines for leaners leading to the following activity. The development of teaching materials followed the Dick and Carey (2015) model uses a system approach, because it is concerned on the relation among each component. The system approach can also enlarge an opportunity of all variable integration affecting on the learning in learning design.

Selection of Dick & Carey (2015) model is based on some reasons, as follows;

1. Meeting four characteristics that should be possessed in development of teaching materials, namely: (a) referring at purposes, (b) having conformity with the purposes, (c) systematically, (d) having guidelines on the evaluation (Miarso, 1987, in Harijanto, 2007); it also meets three main components of learning theory, such as; method, condition and results (Reigeluth, 1992, in Harijanto, 2007);
2. Using a system approach through complete steps and can be used to design the learning, both classically and individually. The learner tasks are as learning designers, implementers and assessors of learning activity results (Miarso, 1987, in Harijanto, 2007). The development results of teaching materials are the cooperation results between learning designer experts, subject content experts, media experts and other experts related to the learning; and
3. It can be used for the development of teaching materials either in verbal information, intellectual skill, or psych motoric and behavior skill fields, so that it is considered to be relevant for Teaching and Learning subject.

Development Procedure

The development steps of teaching materials followed Dick and Carey (2015) model are as follow: (1) identifying learning objectives, (2) analyzing learning, (3) analyzing the learning and context, (4) formulating learning objectives, (5) developing the test items, (6) developing learning strategies, (7) developing and selecting the content of learning program , (8) designing and implementing formative evaluation, (9) revising learning package, and (10) designing and implementing summative evaluation.

The 10-steps development initiated by Dick and Carey (2015) in this development is elaborated into 5 stages of development namely (a) the preliminary study stage including identifying learning objectives, analyzing learning, and identifying early behaviors; (b) the development stage including formulating learning objectives, developing test items, and developing learning strategies; (c) the preparation stage of teaching material products including developing learning program content as well as designing and conducting evaluation; (d) the trial stage of teaching material products is the stage to revise learning package; and (e) the data analysis stage.

Product Trial

Trial Design

For the purpose of trial on the development results of teaching materials for Teaching and Learning subject course, it was conducted three times. First, it was product validation test by 3 experts namely content, language, and design experts. The second test was the initial field test conducted on 6 students participating in the Teaching and Learning subject course. The third test was a major field test conducted on 26 college students participating in the even semester of 2015/2016 academic year.

The trials were conducted to determine the validity, the attractiveness, practicality, and effectiveness of the products developed. Effectiveness test was conducted on two aspects, namely the activity and results of student learning. The test was conducted in the form of a questionnaire referring at textbooks valuation principles, as cited by Muljono (2007). First, the eligibility component contents include (1) Competency Standards that are presented implicitly; (2) Basic Competencies that are presented implicitly; (3) Compliance of teaching material content with KD and SK. Second, the presentation components include (1) a table of contents; (2) the purposes of each chapter; (3) the concept map / epitome; (4) keywords; (5) practice questions; and (6) bibliography. Third, graphical components include: (1) The book covers; (2) the book contents; (3) the legibility; (4) printing quality; (5) the physical strength of books, such as the type of paper, binding quality.

Trial Subject

First product trial subject to validate teaching material products consist of content experts, language experts, and learning design experts. The three experts above are selected based on the validator criteria referring at BSNP (2007). Criteria of teaching book assessors are (1) having minimal education degree of S2 (master study); (2) having teaching experiences minimally two years at its subject science; (3) willing to follow overall assessment process; (4) willing to keep confidentiality of assessment process and results; and (5) not an author or book editor that is assessed. The following trial subjects are students in department of Language and Art Education, Study Program of Indonesian Letter and Language Education, FKIP Undana, the participants of Teaching and Learning subject course.

Type of Data

Data in the form of score was obtained by list of check and content by the content expert, language expert, learning design expert. There are two types of data, namely qualitative data as verbal data recommended by the content expert, language expert, and design expert, as well as the students. The quantitative data was obtained from the score calculation of expert validation questionnaire and student response questionnaires. The data collected through a series of trials were then differed according to their function, as follow (a) the data to test product validation, namely score and review by the experts, (b) the data to know the attractiveness and practicality of teaching material products namely score and recommendation for limited trials and extensive field test, (c) the data to know the effectiveness of teaching material products namely the score that were obtained through lesson study activity and results of Unit I-VIII formative test in initial and extensive field tests.

Data Collection Instruments

Purposes	Aspects that are assessed	Instruments used	Data observed	Respondents involved
Feasibility of Teaching Material Products of Teaching and Learning subject course through *Lesson Study* Model	Product Validation	Validation Sheets	Product Validation	Content Expert Language Expert Learning Design Expert
	Product Attractiveness	Questionnaires	Response by Students as Products' Users	Students
	Product Practicality	Questionnaires	Response by Students as Products' Users	Students
	Product Effectiveness	Assessment Sheets	Student Learning Outcomes	Students
		Observation Sheets	*Lesson Study* activity	Lecturers

Preparation of validation and trial instruments was initiated by compiling grating instruments. The grating instruments include aspects of assessment developed into an instrument indicator in the form of questionnaires using *5 point Likert Scale* with the interpretation as follows:

a. Score 5 (very practical / very well-adjusted / very attractive / very effective)
b. Score 4 (practical / well-adjusted / attractive / effective)
c. Score 3 (quite practical / quite well-adjusted / quite attractive / quite effective)
d. Score 2 (less practical / less well-adjusted / less attractive / less effective)
e. Score 1 (not practical / not well-adjusted / not attractive / not effective)

Data Analysis Technique

The data analysis to know the product validity, attractiveness, practicality, and effectiveness was conducted by using descriptive statistic. Meanwhile, the final product testing was conducted in the form of experimental design through *The Randomized Pretest-Posttest Control Group Design* model. The researchers followed the second design of this model as quasi experimental (Sukmadinata, 2013).

RESULTS AND DISCUSSION

Presentation of Trial Data

Presentation of trial data is detailed into 3 sections, namely (a) validation by content, language, and design experts; (b) initial field test, and (c) extensive field test. The teaching material products were validated by three experts, namely content expert, language expert, and design expert. The expert validation was conducted after the products were completely developed before it was conducted trial to the students.

Expert Validation Results

Content Expert Validation

Review of subject content expert is to obtain data in the forms of assessment, opinions, and recommendations on the textual content of teaching materials, models, and learning guides. There are two aspects of content expert assessment that are developed into 20 questions, namely the content assessment aspect presenting 6 questions and product completeness assessment aspects presenting 14 questions. There are five options available for answer choices each of which was given a score of 5, 4, 3, 2 and 1 for a positive statement. The content assessment aspects obtain total score of 28 out of a maximum score of 30, and the product completeness aspects obtain a total score of 70 out of a maximum score of 70.

Language Expert Validation

Review of language expert is to obtain assessment, opinions, and recommendations on the presentation of materials, instruction, and questions, either practical or formative test in I-VIII unit product. There are two aspects of language expert assessment that are developed into 20 questions, namely the language assessment aspect presenting 10 questions and language learning assessment aspects presenting 14 questions. There are five options available for answer choices each of which was given a score of 5, 4, 3, 2 and 1 for a positive statement. The language assessment aspects obtain total score of 45 out of a maximum score of 50, and the product completeness aspects obtain a total score of 45 out of a maximum score of 50. Total of validation score by language expert is 90 from maximum score of 100.

Design Expert Validation

Review of design expert is to obtain assessment, opinions, and recommendations on the overall product designs. There are two aspects of design expert assessment that are developed into 20 questions, namely the content/material aspects presenting 10 questions as well as title and cover design aspects presenting 10 questions. There are five options available for answer choices each of which was given a score of 5, 4, 3, 2 and 1 for a positive statement. The material/content aspects obtain total score of 45 out of a maximum score of 50, and the title and cover design aspects obtain a total score of 40 out of a maximum score of 50. Total of validation score by design expert is 85 from maximum score of 100.

Combination analysis of expert validation results obtained mean score of 91 out of maximum score of 100 and percentage of 91%. Based on validity criteria that has been set up previously, so the teaching material products obtain "very valid" and feasible criteria to be used.

Data Analysis of Initial Field Test

Initial field test was conducted by six university students from experimental class with IPK categories of high, medium, and low, to obtain response of attractiveness, practicality, and effectiveness aspects of teaching material products that are developed. Student response for product attractiveness aspects obtained score of 44 out of maximum score of 50 or 88%, practical aspects of obtaining a score of 46 out of a maximum of 50 or 93%. The combined results of student responses on the product attractiveness and practicality aspects obtained an average score of 90 out of a maximum score of 100 and a percentage of 91%. The product effectiveness was conducted on two aspects, namely (a) students' activities during the learning

process by using the products. This data was obtained from the acquisition score of the 8th lesson study unit learning value; and (b) the student learning outcomes during the learning process was measured from the test results on eight formative learning units. The students' learning activity obtained a score of 86% and the learning outcomes of 81%. The combined analysis of these two aspects indicated that the learning by using the products was "highly effective" because it reached percentage of 83%.

Data Analysis of Extensive Field Test

The extensive field test was conducted in the experimental classes namely to 26 students. The product attractiveness aspects obtained score of 1.203 out of maximum score of 1.300 with a percentage of 93% indicating that the products developed met the criteria of "very attractive" to be used. The practicality aspect obtained score of 1.256 out of maximum score of 1.300 with a percentage of 97% indicating that the products developed met the criteria of "very practical" to be used. The product effectiveness aspect was measured through the data activity and learning outcomes that reached of 83%, which proved that the learning using the products developed acquired criteria of "very effective".

Data Analysis of Pre-test and Post-test Results

Final product testing was conducted in the form of experimental design through *The Randomized pretest-post-test control group design* model of the second model namely the quasi-experimental. In the experimental group, there was and percentage increased in the learning outcomes before using the products, namely by 866, or 33.31% and after using the product, it has increased to 1,994, or 76.69%. Thus, there was a percentage increase of learning outcome score of 43.38%. In learning control class, it was conducted by not using the products developed, the scores achievement for pre-test was 848 and post-test was 934. There was an increasing of learning outcomes by 3.30% but it was not significant assumed because the teaching material products that were developed were also read by the students in the class control.

Inferential Statistic Test

The data normality test used Kolmogorov-Smirnov test (K-S test), in which the data would be said to be normally distributed, if the value of K-S test result was > the significance level of 0,05. The test result by using *Statistical Product and Service Solution* (SPSS) version 22.0 program showed that the data was distributed normally, in which the K-S test result was 0,200 > 0,05 for *pre-test*, meanwhile for post-test, the K-S test result was 0,76 > 0,05. Homogeneity test was conducted to know whether the data in variable was homogenous or not. The test results that was used SPSS version 22.0 program, for *pre-test* and *post-test* data obtained homogenous data variant results, which the significance level of 0,487 >0,05 for *pre-test* data and 0,058>0,05 for *post-test* data.

REVIEW AND RECOMMENDATION

Product Review

1. The products are referred to as teaching materials for they present description on the teaching and learning materials, arranged systematically and selected according to the

purposes, as well as learning-oriented. The components developed include the content, presentation and graphically feasibility and after being validated, they obtain criteria of very valid, (91%);
2. Design of teaching materials prepared by the Dick and Carey model system approach was tested on an extensive field with descriptive statistics and obtained criteria of very attractive (93%);
3. Implementation of the teaching and learning theory in the a Indonesian Language field of study in Junior High School, Senior High School and Vocational High School on the extensive field tests with descriptive statistics obtained criteria of very practical (97%);
4. The learning using teaching materials through the lesson study application has been shown to be effective (83%);
5. The teaching materials are one of the solutions for lecturers' shortage with learning specifications.

Utilization Recommendation

1. The teaching and learning theories are universal in LPTK. These theories are the main access of learning achievement concerning didactic, methodical, pedagogical, and psychology in LPTK;
2. The behavioristic, cognitive, and constructive theories implemented into the Indonesia Language teaching and learning can be substituted throughout Study Programs in LPTK FKIP Undana.
3. The learning through the lesson study provides collaboration and synergy habits, because it is centered on the learning than teaching, learning concerning teaching and learning for learning.

Dissemination

1. Unit I-VIII: is developed through theoretical aspect discussion followed by implementation of lesson study of Indonesia Language subject course so that it can be applied for all study programs;
2. The *lesson study* model applied is very effective to bridge gaps of theory and practice of learning in LPTK and *stakeholders;* and
3. Growing the cultures of *inquiry, discovery, collaborative, and contextual*, since in the time of study in the university.

Product Development

1. Formulation of learning achievements through the teaching and learning course can be developed for Indonesia Lan learning at every level of education;
2. Making the Teaching and Learning course as the pivot of the entire courses characterized by LPTK from university, faculty, through study program levels in *puzzle* networking.

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