



Developing a model of traditional wisdom portfolio-based teaching for students of Muhammadiyah University Palangkaraya, Indonesia

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Abstract

Teaching content is necessary to adopt the local wisdom. The objectives of the research are to develop a model of domestic intelligence named BETANG (Traditional Dayak longhouse) portfolio-based teaching to elevate the student's learning outcome using Borg & Gall model. The results showed that (1) the development of a model of BETANG portfolio-based teaching had produced a valid portfolio document consisting of Course Outline, Student Worksheet, Evaluation, and Scoring Format; (2) the developed model has created a useful result as shown in (a) significant improvement in student's cognitive aspect, (b) although there is no significant different result in the student's performance skill, the implementation of assessment provides a support to the whole evaluation; (c) a high category of student's self-help, (d) top category of the portfolio ranged between 78.6 - 93.6; (3) student's positive responses towards the model of *BETANG* portfolio-based teaching.

Keywords: portfolio-based teaching, learning outcome, performance, self-help, students

1. Introduction

Teaching basic natural sciences poses problems not only the learning outcome but also the independent and student performance. The independent learning of student is a process of moving power or encouraging them to push their potential to learn the object of learning without any pressure or influence outside. The characteristics of independent learning in each student will appear if students have shown a change in learning style. Students learn to take responsibility to do the tasks independently that assigned to them^[1].

Students' independent of Muhammadiyah University in Palangkaraya, Indonesia tend to be lacking, marked by the students who are given routine tasks generating an unsatisfied result. Another finding, many students do copy paste from friends or other groups when they have a function. Besides, when learning in groups, many students who are passive and only rely on the work of friends who have a better intellectual ability.

Many performance skills have not yet been fully mastered by every student due to the learning system that applied by the lecturer is still a tutorial model, and then, it affects to the students are less able to have an active role^[2].

Assessment is a critical component related to the quality of learning and the quality of the assessment system. Portfolio assessment is one form of evaluation more complete and more accurate due to the portfolio is more emphasis on the process of changing the students' ability as a result of learning, and it is not only focusing on learning outcome^[3].

The weaknesses in the implementing of the learning process with the portfolio-based model are assumed due to the implementation of the learning with the portfolio-based model has not yet been appropriately structured, for example, the lecturing contract and the given tasks are not yet appropriately structured. And, the particular study aims to improve the

weaknesses of the implementation of the portfolio-based learning model by the method of implementing the portfolio-based model which is appropriate to the characteristics of UM Palangkaraya students by imposing local wisdom content.

The general objective of the particular study is to produce a Betang portfolio-based learning model that has an impact on the independent, performance skills and the student learning outcome in the Basic Natural Science) subject.

2. Materials and Methods

The main points in research and development (R & D) comprised of; a) developing model; b) establishing procedures and; c) trial^[4]. Working procedures that are performed with an R & D approach through several cycles are divided into several major stages. There are 10 steps in R & D, they are; (1) conducting preliminary studies (including literature review and field survey); (2) designing (analysis of tasks and research subjects); (3) developing initial product (draft design / initial product design); (4) conducting initial product validation; (5) revising the initial product; (6) performing the limited trial; (7) revising the limited trial product; (8) conducting field trials; (9) revising the field trial of final product; (10) disseminating and implementing the product. To collect the data, in the particular study were used of: (1) qualitative descriptive analysis to describe the average of independent, performance skills and portfolio results; (2) quantitative descriptive report, based on data obtained from the observation, questionnaire and test of learning outcome. The quantitative descriptive analysis aimed to determine the feasibility and effectiveness of BETANG portfolio-based learning model.

3. Results & Discussion

Based on the findings of research and development of the product, obtained data comprised of; need analysis results,

expert validation results, limited trial results, final model, model feasibility, model effectiveness (cognitive learning outcome, performance skill results, independent results, and student portfolio assessment results) and student responses.

1. Need Analysis Results

Based on the analysis results of the collected tasks, it obtained a framework of portfolio learning model that will use in teaching. In lecturing the basic natural science Muhammadiyah University of Palangkaraya has been implemented using Portfolio-based learning model, but the portfolio-based learning model in the lesson had not been well structured, and the characteristics are not accordance with the

actual portfolio method. Moreover, it is not also considered to the aspects of students of the Muhammadiyah University of Palangkaraya.

2. Expert Validation Result

BETANG portfolio-based learning model products had a revision after the quality assessment of prototype by experts who have competence not only in material/content but also proficiency in language and media. Expert judgment is the basis for the post-assessment revision. Summaries of validation results, suggestions and improvements from each expert are presented in Table 1.

Table 1: Summary of expert validation result

No	Prototype	Average/ Category	Comment and suggestion	explanation	Average/ category (after revision)
1.	Teaching planning Lecture Course/ Lecture Contract	84.38% / is valid, or can use but needs to have any revision	Learning objectives should base on indicators, and time sequence in teaching learning process activities is planned per activity (introduction, main, closing).	Already revised	88.13% / very valid or able to use without any revision
2.	Student Activity Worksheet	78.5% / valid, or can use but needs to have any revision	The student activity worksheet is useful, but need to add more about the <i>BETANG</i> contents.	Already revised	87% / very valid or able to use without any revision
3.	Evaluation Tasks	76.94% / is valid, or can use but needs to have any revision.	The instructions should be clear, and the picture should be clear and functioning, word effectiveness in the statement and answer, the deception answer must be right.	Already revised	86.94% / very valid or able to use without any revision.
	Evaluation Sheet of the Practicum Report	3.289/ B	Percentage of assessment must meet accordance to the level difficulty.	Already revised	3.62 / B
4.	Portfolio Assessment Sheet	3.48 / B	Percentage of assessment must be accordance with the level difficulty.	Already revised	3.68 / B
5.	Assessment sheets of the article Analyzing	3.18 / B	Percentage of assessment must meet accordance to the level difficulty.	Already revised	3.63 / B
6.	Task assessment sheets of structured Paper	3.6 / B.	Paper assessment format of is excellent and complete.	Already revised	3.6 / B
7.	Students assessment note sheets	3.8 / B	The assessed components and maximum score are appropriate.	Already revised	3.9 / B

3. Results of limited trial test

Limited trial tests were conducted on three students as potential users. By the, it summarized of; Percentage of Portfolio assessment, assessment sheets of the article analyzing, assessment sheets of the practicum report, paper assessment sheets, and the daily note sheets are changed according to the level difficulty, the duration of task collection and the level of accuracy during the task process. The picture is not entirely satisfying; the time duration of work is too short and then, assumed the student activity worksheet is not maximal. On the evaluation task sheets of the instructions are not visible (not explicitly stated), the picture is not clear, some questions have the same answers, and the difficulty level is quite tricky.

4. Final Model

The final model of product development is presented in the supplements (Teaching Unit, Student Activity Worksheet, Tasks and Assessment Sheet).

5. Model Feasibility

Based on the results of student portfolio assessment, obtained the average score of paper assignment (11.9), article analysis (12.0), practicum report (23.5), cognitive learning outcome (15.6) and diaries (17.2). The calculation results of the average pretest-post-test of student performance are presented in Table 2.

Table 2: Average summary of student portfolio assessment results in implementation class 1

Portfolio Component							
Papers Task	Articles analysis	Practicum reports	Learning outcome	diaries	Total (categories)	Lowest	Highest
11.9	12.0	23.5	15.6	17.2	80.2 (Good)	74.5 (High)	85.08 (very high)

Where: 0 = Very less (0 -20), 1 = Less (21- 40), 2 = Adequate (41 – 60), 3 = Good (61 – 80), 4 = Very Good (81 -100)

Based on table 2 shows that the calculation results for the total score of student Portfolio assessment in the implementation class 1 with an overall average are 80.2 with the lowest score is 74.5 and the highest score is 85.08. By the total, the students achieved very good portfolio score of 55.81% and

44.19% with the good category.

6. Model Effectiveness

The effectiveness of the Portfolio model was based on data of field test 2 results in the control class and the implementation

class 2. Based on the outcome of the student portfolio assessment obtained the average score of paper assignment (13.09), article analysis (13.39), practicum report (25.06),

cognitive learning outcome (15.06) and diaries (18.64). The calculation results of the average pretest-post-test score of student performance are presented in Table 3.

Table 3: Summary of student portfolio assessment results in implementation class 2

Portfolio Component							
Papers Task	Articles analysis	Practicum reports	Learning outcome	diaries	Total (categories)	Lowest and highest score	Percentage of accordance the category
13.02	13.47	25.13	15.05	18.67	84.74 (very good)	78.6 93.8	Good (3.4%) Very Good (96.6%)

Where:

- 0 = Very less (0 -20) N-Gain = Normality of Gain
- 1 = Less (21- 40) Low = 0,3 <
- 2 = Adequate (41 – 60) Medium = 0,3 – 0,7
- 3 = Good (61 – 80) High = > 0,7
- 4 = Very good (81 -100)

Table 3 shows that the calculation results for the total score of student Portfolio assessment in the implementation class 2 with an overall average are 84.74 with the lowest score is 78.6, and the highest score is 93.8. By the total, the students achieved very good portfolio score of 96.6% and 3.4% with a good category.

7. Student Response

Students responses toward the sheets and BETANG Portfolio-based learning models are obtained by asking students to fill out the questionnaires using student response instruments, and the questionnaires are given to the students after the learning. The result of student response analysis is presented in Table 4.

Table 4: Student Response toward Learning Activities

No	Description	Response			
		Happy		Unhappy	
		F	%	F	%
1.	How do you feel during the learning activity?	29	100	-	-
2.	How do you feel about:	29	100	-	-
	a. Course Material...?	28	97	1	3
	b. Student Worksheets?	27	93	2	7
	c. Learning atmosphere in the class?	29	100	-	-
	d. Lecture’s teaching in deliver the material?	25	86	4	14
	e. Assignment by the lecturer?	26	90	3	10
		New		Not New	
		F	%	F	%
3.	Is this new learning model for you?	23	79	6	21
		Yes		No	
		F	%	F	%
4.	During the learning activity, do you:				
	a. Able to express opinions to answer the questions.	24	83	5	17
	b. Able to do practice for performance skills.	27	93	2	7
		Happy		Unhappy	
		F	%	F	%
5.	How would you respond if the next lecture uses a learning model like this...?	28	97	1	3
		Useful		Un-useful	
		F	%	F	%
6.	Is the main course using this Portfolio Model useful to you?.....	29	100	-	-

Note: F = Frequency of student response to learning

Based on the validation results toward prototype development showed that the all components contained in the portfolio have valid and feasible to implement. The main characteristics that can illustrate the effectiveness of portfolio utilization are; 1) reflects the student learning outcome that identified in the core of curriculum where students are expected to learn 2) Focus on the students' performance-based learning experience, as well as acquiring knowledge, skills and key attitudes. 3) Contains work examples of all occupations over a period 4)

Contains specific jobs representing the various measurement tools 5) Contains a working example, and evaluation of the work by students, colleagues, lecturers, and even there is possibility of the parents' reaction^[5]. The cognitive learning outcome may be influenced by internal and external factors. Teaching using Betang-Portfolio document is one of action as an effort to improve the learning outcome externally. Teaching using Betang-portfolio model not only being more meaningful but also train students to

discover their concepts and understanding by finding solutions to solve the problem and accompany the knowledge to be processed into the new knowledge of them. This is in line with Bruner's theory states that discovery learning is appropriate to seek the knowledge actively by the learners, and automatically will give the best results.

Based on the performance-based assessment that found there is an increase in the learning outcome of all aspects/indicators. Although in general, the growth is still categorized as low and medium. But, the implementation of student performance-based assessment has a meaning/value and gives a positive impact and contributes to the overall evaluation result. When a performance-based evaluation is done by teachers, and then teachers have chosen a right way in evaluation and learning ^[6]. Based on the observation results and independence questionnaire both in the implementation class 1 and implementation class 2, both classes showed that student independent is high on Learning Context aspects, compared to issues of personal attributes and processes.

The considerable independence of the Learning Context aspect is assumed that during the lecturing (teaching and learning) process using the portfolio-based model, the students are given the opportunity to explore the learning activities outside of the class. As a result, the students' thinking structure is made. It may not be separated from the learning model portfolio-based that requires an assignment in the document.

Overall, it may state that the lectures based on Betang portfolio-based can improve the learning outcome both cognitive and student performance and independent. The average portfolio score is in the very high category because basically, the portfolio-based learning model is an effort to make the students having the ability to states and express themselves as individuals or groups. In every step, students learn independently in groups. Through portfolio assessments, students may monitor their ability independently, show the different ways of learning with others students, show the quality of their work, have their strengths, develop social (blend to others) skills, and motivate themselves to be more active in learning. Through portfolio-based learning, students have a more meaningful learning experience ^[2].

Based on the result of the questionnaire, the students' response stated that the way of learning by the lecturers and the students' atmosphere in learning is entertaining and exciting, and is also the new experience. It means that students were happy with Betang portfolio-based learning model. According to students, with Betang portfolio-based learning, they more quickly understand the material subject and its application in daily life. The interaction between students and lecturers and students created well through discussion.

The assignments and assessment make the students learning more meaningful and more independent, and able to reflect the learning outcome. It is a reason why they are more passionate about following the learning. In contrast, the student's disagreement to the student worksheet activity and the learning atmosphere with the portfolio model is caused by learning atmosphere that is very oriented to the students and requires the students to practice independently in order to solve the problems meanwhile the lecturer give less about the material, and then they must be ready with the material before

the learning activity begins in order they able to solve the problems that posed by the lecturer at the beginning of the learning activities.

Most of the students think that they have just followed the lecturing with the Betang portfolio-based learning model. Meanwhile, the rest of the student considers that is not new learning model. It may because portfolio learning models have ever been implemented but do not yet have the characteristics appropriate to the needs. However, overall students felt that the learning model has benefit to them because the Betang portfolio-based learning model emphasizes to not only the final result but also the process and the assessment which is done comprehensively, and then, learning are more meaningful.

4. Conclusions

The results of this study have implications toward the learning of Basic Natural Science in general and specifically on the learning of Basic Science subject on students of Muhammadiyah University in Palangkaraya, Indonesia. The theoretical implications are for improving students' learning process and outcomes, lecturers can use various models that have developed and valid. The selection of learning models should base on the needs analysis. The considerations aim to ensure the education practitioners to do the right things based on the students need. Meanwhile, empirically, the implications of the development Betang portfolio-based learning model can improve the students' learning process and outcomes. By the development of prototype product, it is possible to implement the prototype in the teaching-learning.

5. References

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