INTEGRATION OF ETHNO-PEDAGOGY TO DEVELOP BIOLOGY LEARNING MODELS

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Abstract. Model of learning is a syntax or learning steps depicted from the beginning to the end presented in full or typical in the learning process. This study aims to determine the ability of biology pre-service teacher in developing an ethno-pedagogical oriented learning model. This research is a quantitative descriptive research, data obtained based on the results of data analysis is described to obtain information or description of the results of this study. Population in this study as many as 164 students are divided into 38 groups. Technique of data collecting with non-test, data obtained from document of assignment of student report given score based on its indicator which divided into some aspect of assessment and student response questionnaire. The results showed that the ability of biology pre-service teacher in developing the learning model oriented ethno-pedagogy including sufficient category with an average score of 75. Students' response to development of learning model oriented ethno-pedagogy is good, 70.04% of students expected. Thus it can be concluded that the ability of students in developing biology learning model integrated ethno-pedagogy still needs to be developed especially for several aspects. The results of this study can be used as a reference for the lecture program in the future.

Keywords: ethno-pedagogy, learning model, development of learning model, biology learning

I. INTRODUCTION

Learning model is a syntax or learning steps depicted from the beginning to the end presented in full or typical in the learning process. In other words, the learning model is a whole set of unity between approach, strategy, method, and technique. Learning model is like a framework that describes a systematic procedure in organizing learners' learning experiences to achieve specific learning goals, and serves as a guide for learning designers and teachers in planning and implementing teaching and learning activities. The learning model is a description of the learning environment that describes the planning and framework for designing learning to overcome teacher difficulties (Joyce and Weil, 2000; Rustaman, 2005; Arikunto, 2003; Dahar, 1989). This is the heavy duty of a teacher where the teacher in addition must have a reliable competence, should also form a competitive student individual, creative, and character in this sophisticated era. It is certain that only competing individuals will speak in an era of globalization, for which each individual must have reliable competence in various fields according to his / her interests, talents and real abilities along with the advancement of science and technology (Sanjaya, 2005; Sa'ud , 2008). Classroom learning activities can not be separated from the learning model. the accuracy of choosing a chase model for a particular subject will have a good impact on the student. The use of learning models should be a key aspect of learning activities and their implications in education, especially by prospective teachers (Krell, et al., 2015; Cil, et al., 2016). The advancement of science and technology, particularly in relation to learning theory has inspired and inspired many innovations in the field of learning models using technology (Saud, 2008; Zaltman, 1973)

technology can support more motivation and encourage educational programs and improve teaching methods if designed in such a way as to achieve the learning objectives (Costa, et al; Marsh, 1996; Eggen and Kauchak (2012).

Biology is a branch of natural science that studies about living things, especially humans, animals and plants and its interaction with the environment built on concepts based on facts that can be sensed through the process of scientific methods (Rustaman, 2005, Prawoto, 1992). Biology studies many things about living things and their interactions with the environment. The complexity of biological science becomes an obstacle in studying biology especially abstract concept. Biology is concerned with a systematic way of finding out about nature, so that biological learning is not only the mastery of collections of knowledge in the form of facts, concepts or principles but also a process of discovery. In this regard, biology learning emphasizes the provision of direct experience to develop competencies so that learners explore and understand the natural surroundings scientifically. In modern theory, the learning process does not depend on the existence of the teacher (educator) as the manager of the learning process. It is based that the learning process is essentially an interaction between students with the object being studied (Mudjiman, 2009).

The current teacher's demands must have the responsibility of building the character of the nation and culture. In this case ethno-pedagogy has an important role. Ethno-pedagogy views local knowledge or local wisdom as a source of innovation and skills that can be empowered for the welfare of society. Ethno-pedagogy is a practice of local wisdom-based education in various domains such as medicine, martial arts, environment, agriculture, economics, government, dating system etc. The local wisdom deserves to be the basis of education and culture. Introduction to local culture, especially in the Answer to the students is very necessary so that students can live, preserve the culture and himself. The development of ethno-pedagogy oriented biology learning model is expected to provide meaningful enrichment in supporting the national educational goals that will shape the nation's character. Therefore, ethno-pedagogy becomes the foundation in the development of biology-based learning model of local wisdom, because the learning can bring closer the teachers and students with the concrete situation they face to be able to better understand its own culture, so grow and pay attention to the maintenance and utilization of natural environment around (Suratno, 2010). Culture is directly or indirectly, able to provide a certain identity for the individual and the support community (Kosasih, t.t). According to Alwasilah et al. (Suratno, 2010) views ethno-pedagogy as a practice of local wisdom-based education in various domains and emphasizes local knowledge or wisdom as a source of innovation and skills that can be empowered for the welfare of communities where local wisdom is linked to how knowledge is generated, stored, applied, administered and inherited . In this case, local wisdom has characteristics: 1) based on experience; 2) tested after centuries of use; 3) can be adapted with current culture; 4) coherent with the daily practice of society and institutions; 5) commonly done by individuals and communities; 6) is dynamic; and 7) are closely related to the belief system.

II. METHOD

This research uses quantitative method with descriptive research type. The population in this study were 164 students divided into 38 groups. Random sampling technique (ramdom sampling) based on the formula developed by Isaac and Michael (Sugiyono, 2011) as follows:

$$\text{Sample} = \frac{\lambda^2.N.P.Q}{d^2\,(N-1) + \lambda^2.P.Q} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(1)$$

λ^2 = with df=1. P=Q= 0,5. d= 0,005. N= Population

This research was conducted in March 2017. Data collection was done by non test technique. Non-test techniques for collecting data are conducted by questionnaire, document review (document analysis) and teacher assessment results on the developed biology learning model. Questionnaire contains instrument of student attitude toward development of biology learning model with ethno-pedagogy qualitatively. Then the qualitative data is converted to quantitative data. Questionnaire is a statement of 20 items of statement, 10 items of positive statement and 10 items of negative statement. The questionnaires used in this study use Likert scale, with four categories that strongly agree (SS), agree (S), disagree (TS), and strongly disagree (STS). For positive statements the categories strongly agree (SS) given a score of 4, agree (S) given a score of 3, disagree (TS) given a score of 2, and strongly disagree (STS) given score 1. While negative statements, strongly agree SS) was scored 1, agreed (S) given a score of 2, disagree (TS) was given a score of 3, and strongly disagree (STS) was scored 4. The score will be converted and described based on the results of the analysis in this study.

Table 1. Aspects Assessment Report

Numb.	Assessment Aspects	Score
1	Originality	20
2	Accuracy	20
3	Systematics Syntax	20
4	Etno-pedagogycal Integration	20
5	Creativity	20
Total		100

The data analysis technique used is descriptive quantitative analysis. Quantitative data analysis is done by descriptive technique that is statistical data analysis used to describe collected data as it is. The results of analysis in the form of presentation of data in the form of tables and graphs. From the data collected in subsequent research was analyzed by quantitative descriptive analysis analysis technique that is describing and interpreting each component compared with reference criterion based on ideal ideal score (Mi) and ideal standard deviation score (SBi) reached by instrument sheet. This study used a five-scale questionnaire with value and score conversion, determining (Mi) and (SBi) in this study using the formula developed by Jumadi (2012). Determination (Mi) and (SBi) are presented in Table 2.

Table 2. Conversion of scores on 5 scale

Score	Criteria
$x > (Mi + 1{,}8\ SBi)$	Excellent
$(Mi + 0{,}6\ SBi) < x < (Mi + 1{,}8\ SBi)$	Good
$(Mi - 0{,}6\ SBi) < x \leq (Mi + 0{,}6\ SBi)$	Sufficient
$(Mi - 1{,}8\ SBi) < x \leq (Mi - 0{,}6\ SBi)$	Low
$x \leq (Mi - 1{,}8\ SBi)$	Lowest

III. RESULT

The research data was obtained from each group of students of 38 groups who were given the task to develop biology learning model that integrates local wisdom values especially in Tatar Pasundan (Sunda). The result data of the analysis is from the assignment document to the student group which analyzed the data based on several aspects. The result of data analysis is converted into percent (%). For more details are presented in Figure 1.

Based on Figure 1. The highest aspect of assessment is on the integration of ethno-

pedagogy used in developing learning model of 84.87% and the lowest assessment aspect in systematic syntax of learning model development is 64.21%. Based on these aspects can be seen ability of student group in developing model of learning oriented ethno-pedagogy as a whole.

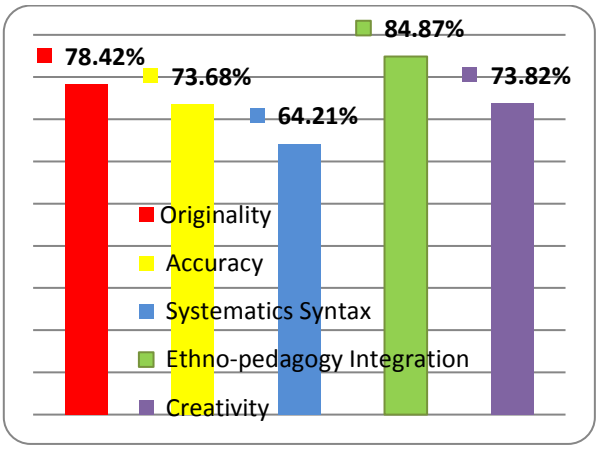

Figure 1. Percentage of Student Ability in Developing Learning Model Oriented Ethno-pedagogy

A. Student Skills Criteria

The average score of the students' group ability is taken from the data of the analysis of the task assessment report of the development of ethno-pedagogy oriented biology learning model. Referring to the formula developed by Jumadi (2012) the average value of students can be classified by category. Each component is compared with category references based on ideal ideal score (Mi) and ideal ideal deviation score (SBi) achieved by the instrument sheet. This study used a 5 (five) scale questionnaire with value and score conversion. For more details are presented in Table 3.

Table 3. Conversion of scores on 5 scale

Score	Criteria
$x > 78,8$	Excellent
$75,6 < x < 78,8$	Good
$72,4 < x \leq 75,6$	Sufficient
$69,2 < x \leq 72,4$	Low
$x \leq 69,2$	Lowest

Based on Table 3. the average score of the students' group ability in developing ethno-pedagogy l oriented learning model 75 is in the range of 72,4-75,6 with the ability of student in developing odel of ethno-pedagogy oriented biology learning included into enough category.

B. Student Response Questionnaire

Questionnaire of student responses in this study was analyzed with the aim to obtain information on how the attitude or response of students to the development of learning model oriented ethno-pedagogy. Data collection was done on the students as many as 30 people. Using the Likert scale the qualitative data is converted to quantitative data. Quantitative data scores are converted to percent (%), then described by data analysis. Description of data recapitulation is presented in Table 4.

Table 4. Description of Student Response to Development Oriented Learning Model Ethno-pedagogy

Statement Numb	Percentage (%)
1	86.67
2	80
3	75
4	75.83
5	78.33
6	77.5
7	72.5
8	73.33
9	65.83
10	66.67
11	63.33
12	61.67
13	57.5

Statement Numb	Percentage (%)
14	62.5
15	60.83
16	65.83
17	64.17
18	70.83
19	68.33
20	74.17
Average	**70,04**

Based on Table 4., it is found that the average percentage of student attitudes is 70.04%. This shows that as many as 70.04% of students responded well to the development of ethnopedagogical-oriented biology learning model from the expected.

IV. DISCUSSION

The model developed is a model of biology-oriented learning ethno-pedagogy especially Sundanese culture that became identity in the environment Pasundan University. This research was conducted on seven semester students (fourth graders) Biology Education, Faculty of Teacher Training and Education. The development of this model encourages one of the postponed university mission "Jembar Budayana" so that its development is thick with elements of Sundanese culture. The ability of students groups in developing biology learning model based on its aspects is quite good with an average above 60%. The originality of the model developed by the student group is 78.42%, this explains that the developed model has good overall authenticity because most of the models developed by the student groups of their thinking based on ethno-pedagogy (Sundanese culture) are not from adoption or modification of other learning models, only a small group of students adopted and modified from other learning models. This is in line with the opinion expressed by Zaltman (1973) an innovation can be a combination of many attributes, even innovation can be born out of pure thought as a result of urgent interests.

The implementation of the learning model is the extent to which the model developed by students can be applied (implemented) in the classroom this is seen from the results of the overall model analysis including indicators, objectives and syntax developed in the learning. The application of the developed model is good category that is equal to 73,68%. Thus some of the models developed by student groups can be implemented in the classroom in the learning process. This is understandable because students already have prior knowledge of the learning model in other courses. As a result, the students are able to design a good learning model and clear direction so that it does not close the possibility that the model can be applied in classroom learning. This is supported by the opinion expressed by Rustaman (2000) model of learning is a frame of mind that directs a designing and implementing learning in the classroom and guide students learn so that the learning and teaching interaction becomes more focused.

The syntax system studied in this study is related to the syntax / systematic syntax created by the student group. The syntax designed by the student group should be clear and sequential (systematic), it will make it easier to understand the steps in overall learning. The ability of students in preparing the syntax systematically can be categorized either that is equal to 64.21%. This systematic aspect of syntax is the lowest aspect Thus the learning syntax developed by the student group is not well structured and systematic, this should be the focus in the course program. This is in line with the opinion of Rustaman (2000) if in the learning of a teacher using the stages of learning, the stages must be certain and clear. The social system and its support system must be well designed, because

the class within the school is part of the social system.

The integration of ethno-pedagogy in the development of the intended learning model is how big the cultural elements contained in the developed learning model. Ethno-pedagogy integration of 84.87%, explains that the learning model developed that is oriented ethno-pedagogy by students is good and most there are elements of ethno-pedagogy in its syntax. This can be understood because most students come from tatar sunda, so the values of Sundanese culture attached to the student self. This of course gives effect to the model of learning that is made because according to what they experience and earn in everyday life especially related with tradition, customs and life pattern of Sundanese society. This is supported by the opinion expressed by Kosasih (t.t: 6) through culture, man fostering interaction with others, with nature, and passing on values that are considered beneficial for their survival from generation to generation. It means that culture is directly or indirectly, able to provide a certain identity for the individual and the support community.

Creativity of model development in this research is intended to the extent to which students can be creative by collaborating learning models that they develop with elements of ethno-pedagogy. Student creativity is good enough that is equal to 73,82%. Although the creativity of students is quite good in developing the model of learning, but the creativity aspects of students are considered the lowest compared with other aspects. This is understandable because a creativity will not come easily, just maybe certain people who have high creativity. This is supported by the opinion put forward by Sanjaya (2005) to ensure that only competing individuals speak in an age of globalization, for which each individual must possess competent competencies in various fields according to his interests, talents and real abilities. In addition, the students involved in this research may have adapted to the environment with advanced technology, living in the midst of cultural acculturation, so they are less understanding of how regional cultural values they should pour in the learning model. in the end this resulted in limited student creativity. The same thing put forward by Kosasih (t.t.) Children past time very challenged by nature and the environment is located. They are able to take advantage of what is in the environment. As a result, they must be creative, always ready for the challenges and obstacles that arise at any time.

The ability of groups of prospective teachers in developing a model of ethno-pedagogy biology-based learning included in the category is sufficient. Thus the ability of the development of biology learning model in prospective teachers should be developed. This is quite understandable because the learning model developed is quite difficult because in it must be related to the model of learning, biology and ethno-pedagogy learning. The same point expressed by Dahar (1989) model is a conceptual analogue used to suggest how to continue empirical research should be about a problem. It is intended that the development of learning model should be continuous especially through various research, so that later will emerge a model that can be applied and can be applied in learning and can be used as solution in education problem especially in Indonesia. In line with the opinion expressed by Arikunto (2003) in conducting teaching and learning activities, teachers may find difficulties in relation to students' circumstances, so teachers should choose the most appropriate. Developing a learning model is not easy because of the many criteria or aspects that students must understand. Innovative learning model that is created must show effectiveness in learning and pay attention to some key aspects and goals to be achieved. In

line with this, Krell, et al. (2015), Cil, et al. (2016) and Costa, et al. (2016) suggests that the use of learning models should be a key aspect of learning activities and their implications in education, especially by prospective teachers, to find new ways of teaching. In this case the student must understand the key aspects in developing a learning model, the key aspects must of course be relevant to the learning objectives, the students' needs in learning and assessment. In addition Marsh (1996), Dahar (1989), Sa'ud (2008) and Sanjaya (2005) stated that teachers should have teaching competence, motivate learners, create instructional models, manage classes, communicate, plan lessons, and evaluate leads to research as the forerunner of innovation so that can compete in the era of globalization. This explains that in developing a model of learning a prospective teacher must have competence in all matters concerning learning. The difficulty in developing the learning model proposed by Eggen and Kauchak (2012) argues that the learning model should be supported by theories and research on learning and motivation. Thus developing a learning model should have a clear theoretical basis and how much better the learning model developed based on some research results. Many aspects or specific criteria must be met in developing a model of learning, for which Joyce and Weil (2000) argue that the learning model should include several aspects such as clear syntax, should describe the social system as a form of interaction, support systems that have always been an important part in the implementation of learning models and impacts on learning in particular positive impacts for students.

Based on the results of questionnaire analysis of the highest percentage of student responses in the statement number 1 of 86.67%. The statement explains that the biology learning model needs to be developed in line with the development of the era. This shows that 86.67% of students assume that existing models especially for biology learning should be developed in this case new innovations are needed more current along with the development of the era. The percentage of the lowest statement is on statement number 13 of 57.75%. The statement explains that students find it difficult to develop ethno-pedagogy biology-based learning. This shows that as many as 57.75% of students find difficulties in developing an ethnethno-pedagogy-based learning model, this can be understood because the development of etethno-pedagogy-based model is new for them and the scope is limited, so that students are not free to develop the learning model in accordance with what they will. But if we examine the numbers are quite balanced, it means as much as 42.25% of students can develop a model of learning-based ethno-pedagogy easily without difficulty.

V. CONCLUSION

The prospective teacher must have the ability to develop a learning model which will be useful in becoming a person. Learning model can be a guideline in the learning process, can also determine success. The results of this study showed that the ability of biology teacher candidates to develop an ethno-pedagogy oriented learning model included in the category enough. Most students support the development of learning models by integrating ethno-pedagogy elements in it. However, students find it difficult to integrate them into the syntax system they design. Of course this should receive special attention in the development of lecture program that will come.

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