

A Needs Analysis for Vertebrate Zoology Materials Development

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Abstract: Referring to its objectives, vertebrate zoology plays a crucial role in preparing students to get involved in an education community. The materials, therefore, are obviously essential to achieve the goal. This study was conducted as a needs analysis prior to vertebrate zoology materials development. This analysis was based on empirical data collected from university students who were majoring in biology education at Universitas Siliwangi Tasikmalaya. Data obtained from 32 questionnaires revealed differences among students based on their experiences. The descriptive statistical analysis showed 93,8% of the students liked the vertebrate zoology subject, 50% of the students recognized the content being learned, 18,8% of the students thought that the materials were abstract, and only 28,1% of the students realized the importance of the subject. Related to the teaching materials, 53,1% of the students stated that it was difficult to find references related to the competences, 65,6% of the students admitted that they needed to apply certain strategies to comprehend the materials, and 100 % of the students liked to get involved in the practical training in labs, but during the process, 81,3% of the students experienced hardship in doing some experiments. Thus, it could be concluded that the subject had not been well interpreted as a subject which can help construct the students' knowledge.

Keywords: development, materials, vertebrate zoology

Education is one of strategic areas in which human resources can be prepared to compete, either at a regional or local scale. Therefore, people keep improving components which can support better education, to seek for gaps between what is going to be achieved and what has been achieved by the students. Education in Indonesia is expected to be able to create humans who have capability to actualize their competence at schools from the elementary level until higher level of education. Besides, the education is also expected to provide information about what needs to be improved in the future in order to respond the upcoming challenges.

According to Yuwono (2005), university students tend to perceive learning as a product. As a result, they memorize concepts, theories and laws. This situation is proven by the test oriented learning which makes students get used to memorizing concepts. Similarly, Sahrudin (2014) argues that students do not construct their knowledge, but they are more likely to perform as a learning object. Suardi (2015) also states that learning is not an absorption process which occurs without active efforts from those who are involved in it. Habok and Nagy (2016) point out significant roles of an instructor in learning. The instructor will be always able to control classroom activities. This condition, however, is in contrast with the constructivism theory which states that knowledge can be more meaningful if it is connected to other body of knowledge or if it is implemented in daily life (Hodojo, 2005). This kind of knowledge, thus, should exist among learners (Krulik *et al.* 2003).

Santoso, (1999) argues that education in Indonesia has not met the expectation. Likewise, Hapsoro (2014) also adds that colleges and universities have not been able to produce independent graduates. Jalmo (2007) states this low quality of education is due to ineffective learning in the classroom. Most instructors are more likely to act as a lecturer rather than a

facilitator. Therefore, it is expected that colleges or universities can empower the education process so that all students are able to develop themselves and become graduates who serve as human resources with high quality (Sukidin, 2014). According to Permenristekdikti No 44/2015 on Standard of Process, an ideal education process has some characteristics; one of which states that learning must be contextual and students-centered (Article 10 sentence (2)a). Thus, learning process should be able to encourage students to dig more information about certain subjects by observing, asking, experimenting, processing data or information, presenting data or information, analyzing the data, reasoning, drawing conclusions, creating, and thinking at lower or higher level.

Galuh (2007) argues that contextual learning can make students' achievement more meaningful. The learning process takes place naturally in the form of students' experiences or activities. In this context, the students need to better interpret learning, understand its benefits, and learn how to accomplish the goals. The students have to realize that they are learning something useful for their life in the future. They need an assistance whom they can work with to guide and lead as well as manage their activities in the classroom.

Based on BSNP (2008), to explore students' ability, lecturers need to develop materials which suit the curriculum demands, goal characteristics, and problem-solving learning demands. Mulyasa (2014) points out that a learning material is one of the factors which influence students' learning achievement. Department of National Education (Depdiknas) (2008); Prastowo (2014) assert that a learning material contains information on a subject which is systematically arranged to be used by instructors in executing learning with stated objectives and implementation analysis. As a result, materials development need to be conducted by the instructors to support learning.

This study aimed to describe the results of needs analysis conducted before developing learning materials of vertebrate zoology subject. These results were expected to add more references of vertebrate zoology.

METHOD

There were 32 students participating in this study. They had enrolled and passed the vertebrate zoology subject in semester 6. Sample was chosen randomly through *simple random sampling* technique which produced 100 participants in the end. This study was a survey by collecting data through questionnaires to gather students' responses towards the learning process, especially seen from the aspect of utilizing learning materials after class. Then, collected data would be analyzed using the qualitative descriptive statistical analysis.

FINDINGS AND DISCUSSION

Results of the study were in the form of general description of needs analysis on zoology vertebrate materials development. This needs analysis was necessarily conducted as the starting point of improving the quality of learning. Data obtained from the questionnaires is presented by Figure 1.

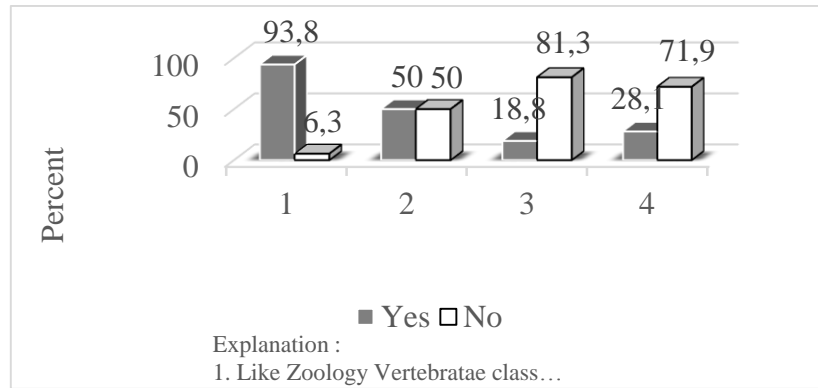


Figure 1. Students' Responses towards Vertebrate Zoology Subject

According to figure 1, the students basically had a great interest in joining the vertebrate zoology subject, but this interest was not fully supported by their knowledge on the course. Their understanding of the materials could be improved by providing the students with more comprehensive learning context.

Students' understanding of the subject materials which are mostly abstract was quite satisfying. Most of the students were able to distinguish concrete and abstract materials, 18,8% stated that this course contained abstract materials which require deep thinking and understanding unlike concrete materials which can be understood through senses. Therefore, learning by context could help the students understand the connection made between the materials content and real life situation. Hernawan (2015) supports this finding by stating that real life context provides more meaningful learning experiences. There were only 28,1 % of the students who realized the significance of this subject. The students had not fully understood learning. These initial constraints became reorientation of learning to improve not only the curriculum content but also pedagogical aspects. There are many variables that can be developed by every lecturer to improve the quality of learning. Figure 2 shows another students' response towards their needs on the course materials.

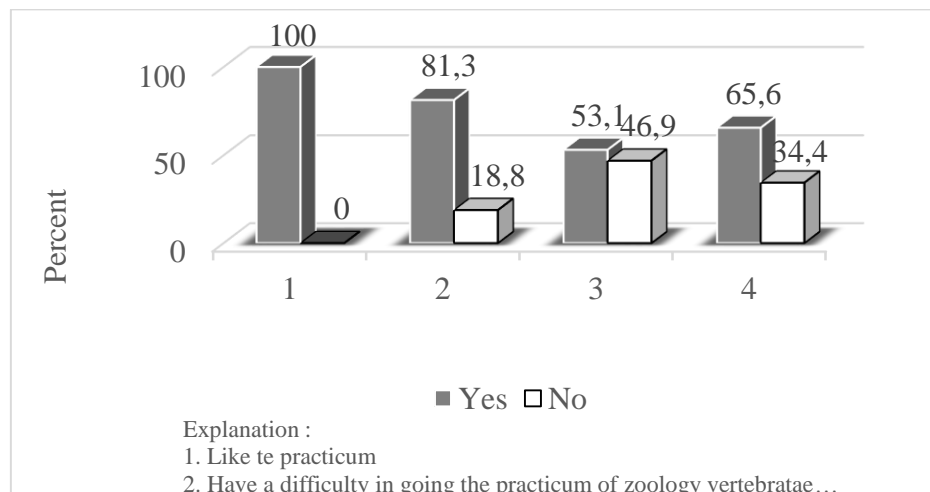


Figure 2 Students' Responses towards Course Materials

All of the students chose practicum as the most appropriate learning activity. This has proven by the fact that the students prefer contextual learning. Depdiknas (2003) argues that

contextual learning belongs to one of holistic educational processes which aim to assist students in understanding subject materials by relating them to their real life context. This kind of learning creates students who have flexible skills and knowledge which can be transformed from one circumstance to another.

One way learning cannot help students understand how to learn. According to Komalaningsih (2007), the students should not only do *hands-on activities* but also need to have *minds-on* experiences. However, there were still many students faced difficulties in practicum since they got used to receiving direct information from the lecturer. Thus, they often failed when faced with real life situation which requires skills.

One of the problems which caused the failure was that it was difficult to find references which supported learning competences. There were 53,1% of the students agreed to this. To fulfill their needs, it is necessary to make an easy access to books and literature which can assist them in learning. As a result, the quality of learning can gradually improve. Gagne and Briggs (1979) state the quality of learning was determined by various internal and external condition of learning.

External quality in AECT (1986) refers to learning resources. The six components of learning resources are messages, people, learning materials, tools, techniques, and environment. Among them, learning materials appear as the most dominant. Learning materials specify learning experiences in the form of structured learning activities which contain variation and result in effectiveness similar to an effectiveness of accomplishing learning goals. Therefore, it is very important for an instructor or a lecturer to have a competence to develop learning materials which suitable with learning requirements and students' needs so that the students can get involved in better learning environment.

According to Joni (1984), five functions of materials which are essential to learning are as follows: (1) to give teacher guidance in managing the learning process, (2) to provide complete material/tools for every learning activity, (3) to connect teacher and learners, (4) to be used independently by the learners to achieve standard competences, (5) to improve learning.

Good learning strategies can help students learn better. There were 65, 5% of the students felt that they needed some learning strategies which could help them get more learning experiences. National Academy of Science (1995) states the process of learning sciences must engage activities which can be done by the students. The students must be given an opportunity to develop their physical or sensory-motor experiences before upgrading their ability to understand abstract things. This, of course, opens a path for the instructor or the lecturer to promote learning by doing.

CONCLUSION

Learning materials are needed to support learning process in the classroom. Since the students were not used to exploring their ability to construct their own knowledge, it became necessary to develop the materials.

Suggestion

There should be a follow-up of this study in order to obtain broader description of vertebrate zoology materials which are suitable with the indicators set to achieve learning goals.

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