ANALYSIS OF KNOWLEDGE AND ATTITUDES TOWARD GENERAL BIOLOGY OF FACULTY MATHEMATIC AND NATURAL SCIENCES' STUDENTS STATE UNIVERSITY OF MEDAN

Naimatussyifa Daulay*, Hasruddin
Program Studi Pendidikan Biologi Bilingual, FMIPA, Universitas Negeri Medan, Medan
Jl. Willem Iskandar Psr. V Medan Estate, Medan, Indonesia, 20221
*E-mail : syifalovato@gmail.com

ABSTRACT

This research aims to know knowledge and attitudes toward general biology of Faculty Mathematic and Natural Sciences' Students State University of Medan (FMIPA) included mathematic, physic, chemistry, and biology department. The research was conducted in FMIPA State University of Medan with population were all of students in education class FMIPA of 4th semester and the sample was taken by cluster random sampling, by takes one education class in each department. The kind of this research is descriptive quantitative. The total of knowledge test is 30 items number was validated before used to students is by expert validator in general biology 2 also test instrument by using validity test, reliability test, and difficulty level test, then there are 15 items number of questionnaire. The result of research are Biology department got better knowledge toward general biology 2 with categorized less (56.6%), good (26.7%), and very good (16.7%), then continue for chemistry department with categorized less (76.7%), good (20%), and very good (3.3%), mathematic department with categorized less (86.7%) and good (13.3%), and last physic' department with categorized less (96.7%) and good (3.3%). Mathematic, physic, chemistry, and biology of students department has most neutral for dimension attitudes and less awareness to love environmental. Students' most favorable attitudes were found toward participating in environmental activities by an institution or community is a good thing is very interesting because most of biology' students agree, then average neural answer for other students.

Keyword: Students' Knowledge, Student's Attitudes, General Biology 2

INTRODUCTION

Pavol (2007) reported that a majority of the students (57%), however do not want to have biology lessons more frequently. Although 16% of the respondents stated that they hate biology lessons, the nature, and biology subjects have not been found as "strange" by 68% of respondents. One of the most striking results of this dimension is that, most of the students (83%) enjoy working with living organisms during lessons. 47% of the students agreed that learning biology improves the quality of life, 33% of them stated that they do not know the answer. All items of dimension were significantly and positively correlated with each other. Evaluation showed that the highest score was obtained for the item which asks about the necessity of biology knowledge for understanding of other courses. And that the lowest was belong to the item which states that, biology is helpful to develop conceptual skills. The importance of biology can summarized as that, they believe in the importance of knowledge of biology, but according to them, biology is not one of the essential issued of their own lives.

In Faculty Mathematic and Natural Science (FMIPA) State University of Medan, after observation and interview directly, there are students still littering, the trash is still in the classroom, and also around building in FMIPA. The researcher gave 10 questions to 40 students in FMIPA State University of Medan. The question is the form of essay test which include about knowledge and attitude of students which relates to General Biology 2 (Appendix 4). After the students answer the questions, there are still 32.5% of students who understand about General Biology 2 topics, 20% of students are middle, and 47.5% of students are low about General Biology 2.

Some of students says the lecturer variation way of learning general biology is lack where class condition and learning process is rigid.

Based on background described above, researcherthink that it is necessary to conduct the research about Analysis of Knowledge Toward General Biology of Faculty Mathematic and Natural Sciences' Students State University of Medan.

The objectives of this research is to know students knowledge of mathematic, physic, chemictry, and biology department state university of medan and to now students attitudes of mathematic, physic, chemistry, and biology department state university of medan.

RESEARCH METHOD

Location and Time. This research is conducted in Faculty of Mathematics and Natural Science, State University of Medan including Mathematic, Physic, Chemistry, and Biology Department. This research is planned for range February-May 2016, which include proposal preparation, research instrument preparation, research instrument standarization, collecting data, and taking conclusion.

Population and Sample. Population of this research is students of Faculty of Mathematics and Natural Science State University of Medan exactly who are in the 4th semester then sample is education class A for mathematic, education class B for physic, education class B for chemistry, and education class C for biology. All of taken by cluster random sampling.

Kind of Research. Researcher use descriptive research methodology.

Research Procedure. The explanation of research procedure are: the research conducted in State University of Medan exactly in the faculty mathematic and natural sciences (FMIPA), then the researcher use General Biology 2 knowledge multiple choice to examine the students knowledge and General Biology 2 attitudes questionnaire to examine students attitudes. The knowledge test and questionnaire must be validated first by validator for construct and content. The

construct is by Mr. Dr. Hasruddin, M.Pd and content is by Mr. Drs. Lazuardi, M.Si. After that the students of FMIPA State University of Medan exactly who are in the 4th semester are given the General Biology 2 knowledge multiple choice and General Biology 2 attitudes questionnaire to examine their knowledge and attitudes toward General Biology 2. For this test, firstly the researcher ask the students greeting then the researcher gives 30 questions of multiple choice to test the knowledge. After that, the researcher gives 40 minutes to finish the test. After 40 minutes, the researcher ask the students to collect the test. And then, the researcher gives the questionnaire about attitudes toward General Biology 2. The questionnaire consist of 15 statements. The researcher gives 10 minutes to answer the questionnaire. No students is allowed to cheat others, the researcher control the class situation. After that, researcher collect the data and then, the researcher does data analysis and finally make some conclusion.

Research Instrument. The researcher formulated 30 number of questions in General Biology 2 multiple choice test to examine students knowledge and 15 number of items in General Biology 2attitudes questionnaire.

Analysis Technique. From the answer obtained for each item is analyzed by noticing how many correct answers and how many tests were answered correctly by the students. if more than half (50%) of total students answered correctly of each item so students considered to get very good knowledge, but if less than half (50%) the number of students answering considered to get not good enough knowledge.

RESULT

From the diagnostic test, researcher got datas which are from each department. Where biology students are got better knowledge than other students of FMIPA State University of Medan. It's continued by chemistry, mathematic, and physic' students.

Percentage of Mathematic' students knowledge in General Biology 2 subject matter 86.7% is categorized less and just 13.3% is

categorized good. For physic' students knowledge in General Biology 2 subject matter 96.7% is categorized less and just 3.3% is categorized good. For chemistry students knowledge in General Biology 2 subject matter 76.7% is categorized less, 20% is categorized good, and just 3.3% is categorized very good. Last for biology' students knowledge in General Biology 2 subject matter 56.6% is categorized less, 26.7% is categorized good, and 16.7% is categorized very good.

From attitudes test, overall, mean score for each dimension seems to be around average.

DISCUSSION

Overall, about half of the knowledge questions were answered correctly by goes to half of all respondents in biology department, but some of them still get less score. It means that students had less knowledge to describing about environmental ethic, bad activity that damaged environment, human population factors, and global warming that actually the students must be aware about that.

For physic' students seem have poor knowledge about General Biology 2. It can be seen almost all respondents got less score. From the test result, the researcher found that almost questions seem very difficult to the students. But the researcher take five range questions which are the question number 6, 7, 12, 15, and 27 seem was very difficult questions. It can be seen many students answer wrongly. In contrast, from the test result of mathematic' students, the researcher found that they answered correctly than physic' students, but the researcher take 5 five questions that was difficult which are numbers 16, 18, 24, 27, and 29. In the same number physic' and mathematic' students less about topic *Reduce, Reuse, and Recycle* (3R). Its clear that they have less basic concept about 3R and not understand what for to learn it.

For chemistry' students, they have better knowledge than physic' and mathematic' students, but researcher take range questions which are the question number 8, 20 ,25 ,29 and 30 seem very difficult questions. It can be seen that many

students answer wrongly. The most topics are about human population, ecology nature, and earth layer. This topic is abstract to learn by the students.

Thisresult because that science curriculum probably might not provide enough place for teaching General Biology 2. The learning-teaching is still based on outdated educational books and solely on lecturer classes which tends to lead to a shallow notion of important General Biology 2 concepts. It would, therefore, be a difficult task for these students to behave as critical and active citizens in a constantly changing society and act directly about their environment, because they do not understand clearly about what learn in classroom.

This should be like Larijani Maryam (2010) says that to protect and preserve the environment, emphasis should be given to environmental education systems in both formal and non formal. The formal education system, teacher plays very significant role for developing great awareness about environment.

Like reported by (Pavol, 2007) evaluation showed that the highest score was obtained for the item which asks about the necessity of biology knowledge for understanding of other courses. And that the lowest was belong to the item which states that, biology is helpful to develop conceptual skill. The importance of biology can summarized as that, they believe in the importance of knowledge of biology, but according to them, biology is not one of essential issues of their own lives. Since the 1970s, there is a consensus that environmental education is crucial for achieving the goals of sustainable depelopment, by creating an environmentally literate citizenry capable and motivated towards environmentally responsible lifestyles (Unesco-Unep, 1992).

Also according to the interview data by FMIPA students, the learning-teaching process of General Biology 2 is only theory in classroom without no variation learning and teaching of lecturer to make students understand about what learn. There is no

video for watch about phenomenon related to environment so they only focused to books and not understand clearly about what read.

Overall, mean score for each dimension seems to be around average. Most of mathematic' students choose neutral answer, very neutral is turning off lights and other electrical appliances when not use in the classroom is by total percentage 96.7%. For biology and chemistry is neutral, and for physic' students answers agree is 70%. It could say that they are still aware or not aware for something good or not good for their environment effect. Aslalin (2011) have research for UP Board and CBSE student in Varanasi City India, found that students environment awareness is still low and have some factors that influence it as follows department class, school background, parent education, and gender.

Then, for mathematic' students, making poster about healthy life can be accepted as way of assignment in the course of General Biology 2 is neutral for 86.7%, and for physic' students as 96.7% neutral. In contrast with chemistry' and biology' students, they are most agree for it. It's very good because at least they have good spirit to make poster as value for persuade people also as product of them after learn General Biology 2 even they never do it.

Throwing trash while sitting in the FMIPA environment got average value for each department in FMIPA. It's so alarming, it means FMIPA students is still lack awareness of the love the environment.Theory in classroom is not enough because the successful should be proven and implemented in daily life. When implementation is hard, it takes hard commitment to change behavior. The attitude is doubt around environment. The relationship between environmental education and positive environmental action is a complex one and requires a deeper understanding of the contributing factors. This is because a behavioral manipulation of many variables can result in students' participation in environmental action in the manner that is pedagogically undesirable (Emmons, 1997).

General Biology 2 is interesting science to study is only chemistry' and biology' students are most agree, and other students was not. For *Reduce, Reuse, and Recycle* (3R) topics is presenting in theory then applied directly is neutral for mathematic, physic, and chemistry' students but acceptable for biology' students even they not application this topic when they was learn about and after.Participating in environmental activities by an institution or community is a good thing is very interesting because most of biology' students agree, then average neural answer for other students.

Using the junk material to make the material unsuitable for use is seems to be average for students in FMIPA. It could say that there are little creativity or doubt about what will produce from the junk material to be use full for their life and environment. Actually, there are many junk material could be use as useful product. Like pipette, it could make as flower decorate, or bottle of water as pot for plant and it also could see in internet about the procedure how to make creativity from junk material. But all of it is depend to students how to be act as someone who do good for environment. Schultz and Zelezny (2000) say that the attitude of concern for the environment originates from individual' concept of self and from the degree of perceiving himself as a fundamental part of natural environment. Behavior is what people do, if its environmentally appropriate or not (Hernandez,2000). Behavior is generally supported by the knowledge and attitude, but the direct connection from knowledge to attitude and on to the behavior does not always exist (Monroe, 2000).

Disposing of waste products of practicum in the trash is the good things is not acceptable because most of students said neutral for three department, there are mathematic, physic, and chemistry's students, then biology' students answer most agree. In fact, the disposing of waste products of practicum become problem. Students around FMIPA known there are cleaning service but responsible to take the trash should be better, because we have to act as agent of change in

our environment. It means that less awareness of students around FMIPA because presenting of cleaning service around FMIPA laboratory building.It also same case with citing trash scattered when walking in the FMIPA building is most answer neutral. Probably presenting of cleaning service makes them not sensitive to look at for bad view around FMIPA building. Researcher have observed directly one hour that in back of FMIPA building, there are some students are working on a report with conditions contained junk food and drink trash around. They are relaxed about their work, and when it done, they just go without citing trash around.

It's like Singseewo (2011) was researching for first year of Mahasarakham University in Thailand. The result of research shows that most of students awareness to environment is in moderate level, it also same result for critical thinking ability. There is no correlation about gender and cumulative value with students awareness for environment, but cumulative value have correlate with critical thinking of students.

Environmental education is instrumental to forming the character of human being who have the attitude, behavior, and high awareness in managing for good environment. However, the reality is still not as expected. In daily life is still found piles of garbage in front of houses, yards, roadsides, traditional markets, and other places that can cause disease source.

From the reason above, the students FMIPA must be aware about environmental issues and give suitable attitudes because it's talk about life around.

CONCLUSION

There are some conclusions from this research, it can be seen as follows: Biology department got better knowledge toward General Biology 2 with categorized less (56.6%), good (26.7%), and very good (16.7%), then continue for chemistry department with categorized less (76.7%), good (20%), and very good (3.3%), mathematic department with categorized less (86.7%) and good (13.3%), and last physic'

department with categorized less (96.7%) and good (3.3%).

Mathematic, physic, chemistry, and biology of students department has most neutral for dimension attitudes and less awareness to love environmental. Also most favorable attitudes were found toward participating in environmental activities by an institution or community is a good thing is very interesting because most of biology' students agree, then average neural answer for other students.

REFERENCES

Aslalin, P.K., (2011), A Study of Environmental Awareness Among Higher Secondary Students And Some Educational Factors Affecting It, *International Journal of Multidisciplinary Research*, 1 (7) : 90-101.

Emmons, K. M., (1997),Perspectives on Environmental Action: Reflection and Revision Through Practical Experience,*The Journal of Environmental Education,* 29(1), 34-44.

Hernandez, O. & Monroe, M., (2000),*Thinking about Behavior. In B. Day & M. Monroe (Eds.), Environmental Education & Communication for A Sustainable World,* Handbook for International Practitioners, Washington, DC: Academy for Educational Development.

Larijani, M. 2010. Assessment of Environmental Awareness Among Higher Primary School Teachers. *Journal Humaniora Ecology*, 31 (2) : 121-124.

Monroe, M., Day, B. & Grieser, M., (2000),*Green Weaves Four Strands. In B. Day & M. Monroe (Eds.), Environmental Education & Communication for A Sustainable World,*Handbook for International Practitioners, Washington, DC: Academy for Educational Development.

Pavol, Prokop., (2007),Slovakian Students Attitudes Toward Biology*, Eurasia Journal Mathematics, Science and Technology Education*, 3(4) 287-295.

Schultz, P.W. & Zeleny, L.C., (2000),Promoting Environmentalism,*The Journal of Social Issues*, 56, 443-457.

Singseewo, A., (2011), Awareness of Environment Conservation And Critical Thinking of the Undergraduate Students. *European Journal of Social Sciences.* 25 (1) : 136-141.

UNESCO-UNEP, 1992, UNCED: The Earth Summit,*Connect, 17*(2), 1-8.