

Critical Thinking Skill of Students on Food Chain Topic and Its Relation to Their Interest

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Abstract—This research aims to investigate the interest of students in science and their capability to think critically on food chain learning on pre-service teacher classroom in an integrative science course. Data were collected using a questionnaire and the essay questions. Rank Spearman correlation test was used to observe this relation. The result showed that there was no significant correlation between the interest of students and their critical thinking on the food chain learning (sig. 0.519) and the relationship of them was weak ($r = 0.081$). Many factors may influence the critical thinking of the students in food chain learning.

Keywords—critical thinking; the interest of students; food chain

I. INTRODUCTION

Indonesia has a significant curriculum transformation and also revision since 2013 [1]. This transformation is fastly changing the learning habit in Indonesia, from the small aspects to the significant elements. One of the major alterations is about the learning model that we need to use in the classroom. In the newest education system in Indonesia, the curriculum demands four main learning models to stimulate students to think higher consist of discovery learning, problem-based learning, project-based learning, and inquiry [1]. Moreover, these learning models are recommended to be implemented in the classroom all over Indonesia in all of the subjects.

The target of the new curriculum is to enhance the critical thinking of students to solve the problem in their surroundings. Critical thinking is vital because it uses the ability of students to analyze the phenomenon that appears in our daily basis and find the solution to tackle the problems. The latest curriculum design is the most appropriate strategy to be applied in Indonesia, which is one of the most populous countries [2].

Today, the critical thinking ability of students in Indonesia is not growing up a time to time [3]. So, we need to find what factors can affect the way students to think critically. This research investigates the interest of students to do the learning process because the interest is one of the fundamental elements [4]. Furthermore, the paper will explain the profile of the interest of students and the relation with critical thinking skills on food chain learning. The food chain learning is fascinating

because students enable to observe the real phenomenon happen, such as the chaos of some species food chain [5].

II. METHOD

A. Sample

The research involved 65 students who enrolled in Department of Science Education, at 7th Grade Integrative Science Course.

B. Methodology

The non-parametric test (Spearman Rank Correlation) was used to investigate the interest and critical thinking of students on food chain learning on figure 1. During the learning, students focused on the given topic which discussed the food chain and its relation to the ecosystem. Then students needed to answer all questions on the worksheet and presented it in front of the class. The data were collected from the questionnaire after conducting the learning process. The questionnaire asked about three reasons related to their interest: (1) the subject is easy to understand, (2) the topic rose their learning motivation and (3) it would be beneficial for their daily life.

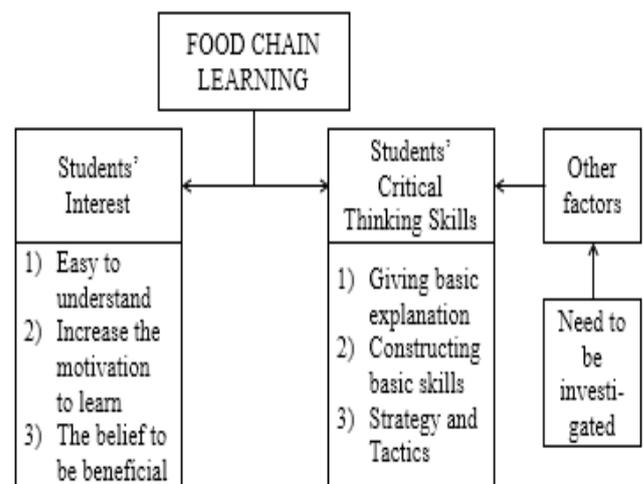


Fig. 1. The detail of the interest and the critical thinking of students.

III. RESULTS AND DISCUSSION

Figure 2 shows there was no tendency regarding the interest of students and their critical thought. It shows that critical thinking did not depend on the interest of students. Students who gained 59.00 point on critical thinking have different scores on the interest scores: one student gained 33.00 and one students gained 100.00, and the rests (0.00 and 66.00) were none. The students who gained the highest score (92.00) were also diverse on the interest score: one student obtained the lowest rating (0.00), no student obtained both 33.00 and 66.00 and two students achieve the highest one (100.00).

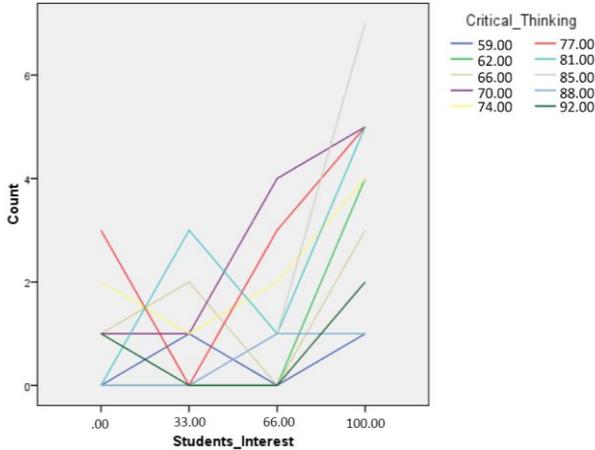


Fig. 2. The number of interest of students and their critical thinking scores.

The interest of students, which is showed by the graph in Figure 2 is found to be diverse. The number of students who have the highest interest (100.00) in learning food chain was dominated by students who gained 85.00 on their critical thinking test, and the lowest interest (0.00) went to students who obtained three different scores on their critical thinking: 59.00, 81.00, and 88.00. The interest of students was only categorized into 4 group of scores (0.00; 33.00; 66.00 and 100.00). Moreover, here is the detail of the number of students on each score categories of the interest of learning food chain: (1) 8 students obtained 00.00; (2) 8 students gained 33.00; (3) 12 students acquired 66.00; and (4) 37 students achieved the perfect point, 100.00.

Over 70% of the students were interested in learning the food chain learning on figure 3. Based on a short interview, most of the students believed that the leaning material would be so beneficial (more than 80%) for their life due to the students are going to go to school as a teacher. Also, the other backgrounds, the easiness and the motivation factors gained under 70% which showed that the primary goal of students studying the topic was not going to the way how students answered the question and more motivated, but related to the benefit of studying this material.

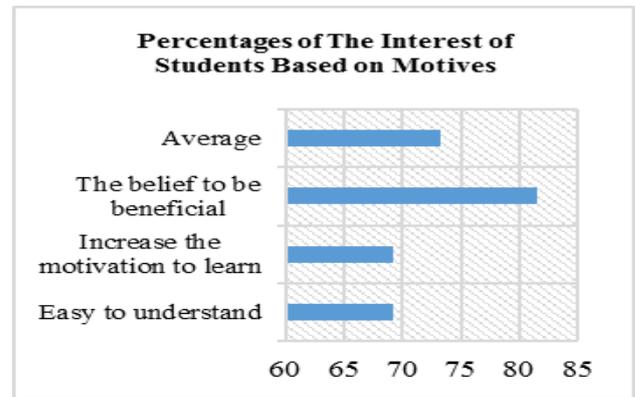


Fig. 3. The background of the interest of students on food chain learning.

To investigate the relation between the interest and their capability to think critically, Spearman Rank Test was applied to examine the correlation coefficient (r) between these two variables. This research measures 65 students to record the data in two different classes. From the table 1, there was no significant correlation ($\alpha = 0.05$) between the interest of students and their critical thinking (sig. 0.519). It also shows the value of r^2 is really low (0.006561) which means that the interest of students in learning food chain influences 0.6% of student's critical thinking. It indicates that the high interest of students to learn the food chain topic did not make students achieved higher critical thinking.

TABLE I. THE STATISTICAL CORRELATION TEST BETWEEN THE INTEREST AND CRITICAL THINKING OF STUDENTS

Aspect	N	Correlation Coefficient (r)	r ²	Sig. (2-tailed)
The interest and critical thinking of students	65	0.081 ^a	0.006561	0.519

^a. $\alpha = 0.05$

Several factors were influencing the interest of students to learn food chain learning. The type of activity in the classroom was also fundamental to increase students to learn. Students tended to emphasize the activity of classroom activity instead of the learning materials itself [4]. The learning on this research was using the discovery learning which was combined with analyzing the scientific literacy questions. Students were assigned to work on these question in a group that they have formed. The teacher engaged the interest of students through the exciting topic of learning material, starting to ask the student with a contextual question about symbiosis interaction between buffalo and starling.

The questions which were stressed to tackling the problem, as used in this research is right to be implemented to enhance the ability of students to think critically [6]. It stimulated students to think how to find the solutions in order the problem in their surrounding would be solved. The example question in food chain learning to eager students to think critically was asked about the similarity and difference related to the complex food chain.

The complex food chain stimulated students to find the similarities and also the differences through the analysis process, which was going to enhance their capability to give the basic explanation as one of the critical thinking indicators. Students could choose so many alternative options to write down their thought during analyze the picture. The producer, the organism who can do photosynthesis process, in the food chain is a center of some organism food source, for instance, phytoplankton, which is eaten by krill, see figure 4 [7].

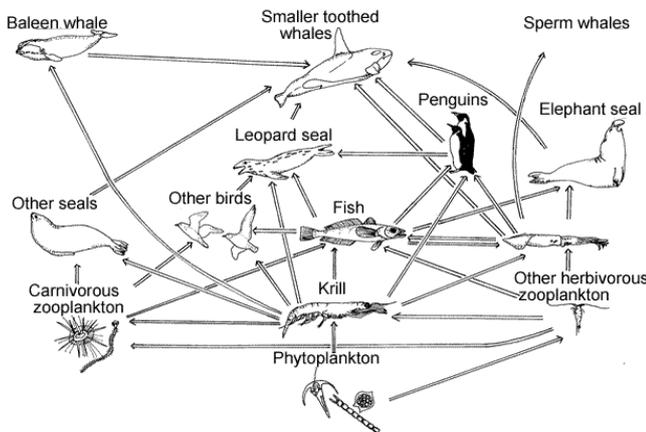


Fig. 4. The extended food chain: Antarctic ocean food web.

From the picture, we can observe the pathway of the food chain which constructs the food web. Students also have the chance to mention the variety of the food chain that they have never seen before. One of the examples of the food chain from the figure is phytoplankton (producer) – krill (primary consumer) – fish (secondary consumers) – penguins (tertiary consumers) and smart toothed whales (quaternary consumers). That information can be used as a model of the answer of the students in finding the similarities in food chain structure. The motive of giving such type of questions, which based on the problem, was to enhance the capability of students to think critically [6].

The research emphasized students to find the concepts through the learning inside and outside the classes (in task form), this aimed to improve the interest of students [8]. However, the interest of students did not influence students to think critically. The use of learning multimedia was one of the alternatives to increase the interest of students [9]. Furthermore, online media also may have a positive impact on the increase of emotional engagement [10]. Moreover, the use of multimedia on food chain learning was fascinating because students can see the actual condition through video, pictures and so on. It was important because the concept mastery of students in Padang is still low [11]. Also, the traditional way of learning such as reading before the class has also not relation to the curiosity of students [12]. So, the using of multimedia is one of the solutions to assist students to increase their interest and critical thinking skills.

IV. CONCLUSION

There was no significant correlation between the interest and critical thinking of students on food chain learning. Several factors may influence the critical thinking skill of students instead of their interest to learn the food chain material. The next study has to measure the more specific interest of students to investigate one of the factors influencing critical thinking skills. Also, the following research needs to implement the in-depth interview to explore more information about the interest of students in learning science content.

ACKNOWLEDGMENT

Authors thanks Lembaga Penelitian dan Pengabdian Kepada Masyarakat Universitas Negeri Padang (LP2M UNP) who have given the fund to conduct this research.

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