

# Students' Critical Thinking Ability in Tennis Mathematics of Physical Health Education and Recreation

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**Abstract-** This study aims to determine the ability to think critically in a tennis course. The research subjects were 87 students of Physical Health Education and Recreation Study Program in IKIP Budi Utomo Malang. Critical thinking skills measurement instrument consisting of 7 critical thinking skills essay questions where the data were analyzed by using a descriptive method based on critical thinking skills indicators. The instrument used in this study was an instrument from Greenstein. The results of the study of critical thinking skills show that the average acquisition results of critical thinking skills by 47% including the category is still low and need improvement in learning activities that can improve the students' critical thinking skills of Physical Health Education and Recreation IKIP Budi Utomo Malang.

**Index Terms-** Critical thinking ability, Tennis courts, Mathematics, 21<sup>st</sup> Century

## I. INTRODUCTION

The educational organization Partnership for 21st Century Skills (P21) and The International Society for Technology in Education (ISTE), The United Nations Educational, Scientific and Cultural Organization (UNESCO) have created guidelines on 21st-century competencies. The 21st Century skills are life and career skills, learning and innovation skills, and information media and technology skills. Those three skills are covered in a scheme called rainbow 21st-century knowledge-skills rainbow [1].

The 21st Century Competencies emphasize education must focus on mastering subjects and developing 21st-century skills. These skills help students to be ready to take higher education. Schools are required to be able to prepare students to enter the 21st century. Therefore, university as the institution which produces prospective teachers must be able to produce graduates

who have 21st-century competencies. The way teachers teach must be changed in order to adapt to the 21st-century generation. Teachers need special competencies to change traditional teaching methods towards transformational [2]. Strategies used to achieve 21st-century skills include 4C skills (problem-solving, critical thinking, collaborative learning, environmental integration, and digital teaching materials [3].

Critical thinking is a mental process to analyze or evaluate information. Such information can be obtained from observations, experiences, common sense or communication. The ability to think critically is needed by students, related to the needs of students to solve problems faced in everyday life [4]. Also, critical thinking skills are also needed by students to face the challenges of the 21st century [5]. Indicators of critical thinking developed by Greenstein [6]. The ability to think critically is an important thing, but the reality on the ground is not as expected.

A physical training program with external weights refers to the patterns of motion that exist within a sport that is carried out without exception of a tennis court [7]. In the tennis activity, the arm's muscle is very important to improve performance. Arm muscles consist of biceps, triceps, and forearms. The hand, chest and back muscles are the main muscles for bodybuilding to build a beautiful upper body and provide an ideal shape. Tennis is one sport that is carried out by one or a pair of players who are faced with being limited by a net. It needed a racket and a ball made by rubber that contained wind and wrapped in felt. Besides, it is not only requiring the power to hit the ball, but also it needs the skill

of placing the ball on an empty side, so the opponent is difficult to return.

Tennis courses are one of the compulsory subjects that must be taught at the university level. Most students still consider that tennis material is the most difficult, abstract, and so frightening. Then, their mastery of tennis material, in general, is very lack. The success of students in learning tennis field is not only influenced by the ability of students themselves but it is supported by factors of lecturers and learning models used in the classroom. A lecturer needs to make the process of learning tennis in a field that requires students to be able to develop critical thinking skills.

As an educator, a lecturer must be able to create learning that can practice critical thinking skills to find learning information independently and actively create cognitive structures for students [8]. The efforts to establish optimal students' critical thinking skills require interactive classes, students are seen as thinkers not taught, and lecturers act as mediators, facilitators, and motivators who help students in learning not teaching. The purpose of this study was to analyze the critical thinking skills of physical health education and recreational study program in IKIP Budi Utomo Malang. This is important as an input for lecturers to be able to design appropriate learning and improve students' critical thinking skills.

## II. METHODS

This research used survey method with data collection techniques such as test. The questions were given to students of the fourth semester of the Physical Health Education and recreation Study Program in IKIP Budi Utomo Malang. The research subjects who took the test were 87 students consisting of 44 students in class A and 43 students in class B. The instrument used was an essay question consisting of 7 critical thinking questions. The instrument used in this study is an instrument from Greenstein consisting of applying, evaluating, using data to develop critical insights, analyzing, and synthesizing [6].

Data analysis was performed by using the average description method as an explanation of student test results based on indicators of critical thinking skills.

## III. RESULTS AND DISCUSSION

The results of the study of critical thinking skills of Physical Health Education and Recreation Study Program in IKIP Budi Utomo Malang, in which the tennis course are relatively low, this is shown in the acquisition of the average percentage of critical thinking abilities of 47% with fewer categories. For more details, it can be seen in Figure 1 below.

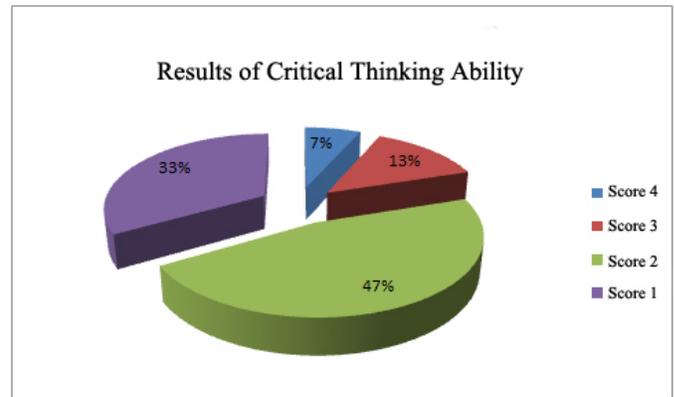


Figure 1. Result of Critical Thinking Ability

Figure 1 shows the average critical thinking skills as much as 47% (less), 33% (fair), 13% (good) and 7% (very good). These results are still far from the ideal value that can be obtained so that the critical thinking skills possessed by students of Physical Health Education and Recreation Study Program in IKIP Budi Utomo Malang in the tennis course are relatively low at 47%, Thus, it needs solutions to improve critical thinking skills.

The critical thinking ability students of Physical Health Education and Recreation Study Program in IKIP Budi Utomo Malang is relatively low. This is evidenced by an average percentage of 47% this is in line with research conducted by Kolb's Pattern which states that had the convergent learning style [9]. That results shows that the critical thinking ability of the students still low. The low critical thinking ability of these students is partly due to the learning implemented in higher education is still dominated by lecturers. Hence, it does not train students' critical thinking skills. This is in line with Patonah's research which revealed the process of learning tennis is still dominated by lecturers [8], learning tends to memorize rather than developing thinking power so that students are weak in

conveying their own ideas, weak in analyzing, and dependent on others rather than being responsible for their choices own.

The lack of critical thinking skills can cause an unfavorable effect on further education. Therefore, critical thinking skills need to be trained. This is in line with the opinion of Johnson that critical thinking is a directed and clear process used in mental activities such as problem-solving, decision making, analyzing assumptions, and the ability to organize in an organized manner [10]. Activities formulate questions using prior related knowledge [11], which encourages students to think at a higher thinking level [12]. Critical thinking skills must be trained in students because critical thinking allows students to analyze their thoughts in making choices and draw conclusions intelligently. If students are given the opportunity to use thinking at a higher level at each grade level, then students will get used to distinguishing between truth and lies, appearance and reality, facts and opinions, knowledge and beliefs [13]. So, each student has critical thinking ability that is different from each other according to the learning styles applied by students [14]. One way to practice critical thinking skills is through the learning process.

Lecturers must be able to create learning that trains students' critical thinking skills. The selection of the right learning model will activate all the potential possessed by students which in turn can improve their critical thinking skills. Various learning models that can be applied include anchored instructional learning models. Anchored instruction is a learning model that uses multimedia assistance (video) as a means to provide problems. These problems are in the form of real problems that are presented in the form of narratives or stories that motivate students to solve problems. The use of technology with models combination is an important step that leads to a more effective learning experience [15].

#### IV. CONCLUSION

Based on the findings, it can be concluded that the average critical thinking ability of students is 47% and it is including in low category. It needs improvement in learning activities that can increase the critical thinking skills of students of Physical Health

Education and Recreation Study Program in IKIP Budi Utomo Malang.

There is not any difference in the decline (change) of anxiety in tennis courses that students are taught with the Sony Vegas approach and students who are taught with the media anchored approach, in which it is well-reviewed based on the overall student. There is an interaction between the learning approach factors and grouping of students to the ability to think critically about tennis courses or anxiety on students.

#### Suggestion

Based on the findings of the study, the researcher provides several recommendations to Physical Health Education and Recreation Study Program that are expected to be useful in learning tennis. Namely Lecturers of Physical Health Education and Recreation Study Program should pay more attention to the Sony Vegas media approach in tennis courses because it can improve students' thinking skills, especially the critical thinking skills desired in the curriculum. Lecturers should understand the Sony Vegas media approach and the steps of learning well so that they can apply it according to the material and thinking abilities of students. It is better for the Physical Education Lecturer to focus on learning, in order to improve students' mathematical thinking abilities, especially critical thinking in tennis courses so that learning becomes more meaningful in preparing for life outside the environment.

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