

Enhance Critical Thinking in Physical Education among Malaysian University Students

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Abstract The paper gives information of the importance of Critical Thinking (CT) and its role in physical education. Furthermore, it is going to review the dispositions of critical thinking and explores the answer to two questions: How can critical thinking relate to the area of physical education and sport? How can be CT used in fields of sports or within the physical education lesson? According to the experimental survey, the findings indicated that the level of CT dispositions was moderate for all subscales. The result also shows the highest correlation between harmonious passion and critical thinking disposition ($r = .240$, $p < 0.01$) as well as there is a low correlation between passion criteria with open-mindedness and systematicity ($r = .157$, $p < .05$). Therefore, the students need more critical thinking activities to enhance their ability and skill and if students show a strong passion toward an action which they like most, they will perform better in physical activities.

Keywords Critical thinking, Physical Education, Disposition, Sports, Passion

1. Introduction

The combination of critical thinking and physical education as a theory might have paradox in terms, but previous studies on this subject have indicated that the physical education background is preferably suitable for fostering critical thinking [1, 2, 3]. It has been known that if we want critical thinking happen in a physical education class, students should demonstrate positive "dispositions" to the process of critical thinking, which support and drive the procedures of critical thinking and a underperformance in any of them can mean that critical thinking will not happen [4]. According to him, these dispositions defined as students who are being open-minded, sensitive to others' thoughts, cooperative, and keen to take risks. These kinds of students recognize and comprehend problems, then choose how to perform them, and assess internal and external sources of feedback. In contrast, students with no dispositions have a tendency to lean too much on their teachers in order to get information, care, and guidance [5], since in their opinion the teacher is the only source of information. This paper reviews the role of critical thinking in physical education and explores the answer to two questions: How can critical thinking relate to the area of physical education and sport? How can be CT used in different fields of sports or within the physical education lesson?

2. An Overview of Critical Thinking (CT) Definitions

What do we mean by thinking critically? CT can be defined well as questioning and emerging opportunities in order to compare and analyze many thoughts; advance and enhance thoughts; make operative decisions and conclusions; and offer a comprehensive groundwork for operative action.

Critical thinking was described as a skill that can analyse facts, produce and organize thoughts, protect ideas, contrasting capability, give suggestions, assess point of views and resolve problems [6]. [4] views critical thinking as an evaluative skill, which allows an individual to assess information in order to make a judgement on its validity, worth, or accuracy. He asserts that critical thinking also contains an organized process of approaching, evaluating, and thinking through a problem or challenge. CT is a significant ability because it is obligatory in the workplace or classes to help teachers and students deal with questions. The ones who think critically promote vital questions and problems; they can express the questions clearly, gather relevant information, use intellectual ideas, think about it open-mindedly, and finally communicate effectively with others.

According to [7], critical thinking is an "intellectually disciplined process". The intellectual process of CT is the ability to conceptualize, apply, analyze, synthesize, and assess information that has been collected from observing, experiencing, reasoning, or communicating, as a chaperon to belief and action. In their article by [8] it was mentioned that

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CT contains two modules, the first one can be defined as a set of data and thoughts that are producing and treating skills, and second one as the habit, constructed on knowledgeable commitment of using those skills to lead behavior.

According to their definition, two main concerns can be drawn out. 1) Critical thinking must be a kind of skill that can be learned. 2) Critical thinking is a kind of mind habit or a knowledgeable quality, which is used willingly and the effects of these reasoning skills is accepted. Thus, CT is a set of knowledgeable qualities that noble thinkers possessed it. Therefore, it is understood that it does not contain mindless set of reasonable principles 'as an exercise'. This suggests that there should be some kind of metacognitive awareness on the part of the thinker of his own thought process. Therefore, it can claim that CT includes a set of adapted skills possessed by the agent and applied to his thinking.

In the article by [9], critical thinking defined as a self-disciplined and self-guided thinking process that attempts to judge to best level of quality open-mindedly. People regularly try to live reasonably, if they think critically. They use the intellectual tackles that critical thinking suggests; ideas and ideologies, which enable them to examine, evaluate, and then expand thinking. This kind of people works thoroughly to advance the intellectual qualities of intellectual truthfulness, intellectual humbleness, intellectual graciousness, intellectual compassion, intellectual sense of justice and confidence in reason.

[10, 11], also mentioned that critical thinking includes of some thinking essentials, widespread intellectual values and knowledgeable qualities. They explained these essentials as aim, question at subject, point of view, information, explanation and implication, thoughts, expectations, and consequences, while the intellectual values that are connected with CT are defined as logic and fairness, extensiveness, relevance, clarity, precision, accuracy, depth.

Another definition of CT by [12] stated that critical thinking is an active and continuing reasoning process of logical thinking in which the individual systematically discovers and analyzes subjects, understands compound thoughts, considers all aspects of a situation and/ or argument and where suitable follows with practical judgment. Therefore, a person with a good memory and knowledge of many facts is not necessarily good at critical thinking. A critical thinker is able to deduce consequences from what he knows, and he knows how to make use of information to solve problems, and to seek relevant sources of information to inform him.

It should be considered that not all the meanings of CT are analyzing thoughts as intellectual power. For instance, critical thinking is a series of processes: it is the assessment or formulation of beliefs, or the fact of rational standards. Critical thinking is systematic because it involves different procedures and methods. And it works according to the rules of rational belief is judged by how well they are supported by reasons [13].

Similarly, critical thinking was classified as a series of balanced standards rather than a set of intellectual talents

which have controlled by a thinker [14]. By having critical thinking the individual can look for to examining the expectations as well as suggestions on an issue which are brought to him by other people or by himself; such inspection is improved by putting thoughts and practices in strain with substitutes.

[15] introduces a six-step process which are the core skills in critical thinking: interpretation, analysis, evaluation, inference, explanation and self-regulation. Interpretation means understanding and expressing the implication or meaning of various experiences, situations, procedures or criteria. It was mentioned as "initial interpretation" [16] for students as CT skills. Analysis or arguments analysis is a skill or process in CT, which helps to identify the real relationship between statements, questions or concepts, descriptions, judgments, experiences, or opinions.

The next step is called inference, which is defined as identifying the features, required to produce sensible outcomes; to reflect relevant facts and to reduce the concerns resulting from facts, reports, ideologies, ideas, explanations, requests, along with further types of representation. The next step in critical thinking is to judge the actual reliability of claims or other statements accounting or describing an individual's experience, or view points; and to evaluate the reasonable strength of the definite inferential interactions between reports, requests or further types of representation. For instance, the students will ask: Do we have our facts right? Alternatively, how strong are those arguments? Explanation is the fifth step in CT, which is to present the outcomes of one's arguments, to validate those arguments by evidence, consideration of concepts, methodologies, and context based on their own results and to offer one's thinking in form of forceful arguments. For example, what were the specific findings of this investigation? How did you come to this interpretation? Finally the last step or skill is Self-regulation which is defined as observing one's cognitive actions as well as the components which are used in those actions, and the outcomes drawn from that, mainly by using the skills of analysis and assess one's judgment by questioning, or correcting any single decision or thought [16, 17, 18].

3. Critical Thinking in Physical Education

[1] defined critical thinking in physical education as "reflective thinking that is used to make decisions and upheld the motion responsibilities and challenges. Basically, when students think in a critical way, they think about compound information that are gathered from different sources and perceptions, to make a reasonable decision that can be explained and defended. The thought was represented internally by mental activities and external in the form of actions and decisions.

[19] stated that [1] proposed an initial model of critical thinking in physical education. In this model, he proposed that critical thinking in physical education could be visualized as a loosely configured four-step process:

cognitive organizing, cognitive action, cognitive outcomes, and psychomotor outcomes. Cognitive organizing is the process an individual goes through while focusing on a movement problem and assessing and analyzing information regarding that problem. Cognitive action is the process of utilizing the information gathered in the organizing stage in order to develop and refine responses to a movement problem. Cognitive outcomes and psychomotor outcomes can be viewed as inter-dependent processes where the learner can evaluate a solution to a movement problem by discussing it with a teacher or coach and then, ultimately, assess it through actual motor performance. Therefore, in McBride's model, critical thinking is viewed as an active process of organizing information, using that information to develop a strategy to solve a problem and applying it in a movement situation.

[20] discovered that some of teachers inspire the combination of their basic cognitive thinking with the content of the movement actively. In this study, teachers use the model planned by Logsdon *et al.* (1984), based on the basic principles of the movement have to do with the body, space, effort, and money. There are four questions about the activities of movement which should be answered by students: What can my body? Where to move my body? How does the movement of my body? And what happens as I move the relationship?

[21], who are following the lead of [1], defined critical thinking in physical education in a broader sense. They regarded critical thinking as a process that encompasses all levels of ability and the everyday experiences of the student. They view critical thinking inclusive of the concept of creative thinking where an individual goes through the process of thinking of various possibilities as solutions to a problem. It is a very basic way of thinking not unlike the everyday types of decision making and problem solving we go through on a day- to-day process, and most importantly, critical thinking does not require high levels of intelligence, just simply the ability to look at various solutions, to take different views, and to explore more options to a problem. Therefore, they adapted their broad definition of critical thinking into four areas: Broad and adventurous thinking, Causal and evaluative reasoning, Planning and strategic thinking, and Metacognition [19, 21].

They regarded CT as a process that encompasses all levels of ability and the everyday experiences of the student. They view CT inclusive of the concept of creative thinking where an individual goes through the process of thinking of various

possibilities as solutions to a problem. CT does not require high levels of intelligence, just simply the ability to look at various solutions, to take different views, and to explore more options to a problem.

There is an example of CT in physical education mentioned by (Lodewyk, 2009) for the player to decide whether or not to shoot the ball in netball. The information about the rules must be processed internally by the player (e.g., "Am I in a legal position to shoot?"), strategies (e.g., "Am I strategically positioned to shoot?"), challenging sources of information (e.g., "Should I pass it to Jane, who is open on the baseline?"), his or her talent (e.g., "Is the context appropriate for me to succeed?"), and feelings (e.g., "Am I confident I can make the shot?"). If students decide to shoot, their critical thinking skills will be replicated in the decision of whether it is wise and how the shot was done.

CT does have a place in the psycho-motor domain. Physical education and sport environments can provide a supportive environment for individuals to learn how to think critically. The practical nature of physical activity allows the individual to apply a new strategy, attempt a new movement and evaluate the worth of the response almost immediately. The National Association of Sports and Physical Education [NASPE] - (2004) demonstrated a level of thought and decision making, the need for critical thinking is clear. For example, NASPE (2004) pointed to there is a need for all children from kindergarten through grade 12 to benefit of physical education through an increase of the judgment, i.e. "Students learn to assume leadership, cooperate with others, and take responsibility for their own behaviour."

A research on critical thinking and physical education has been done for Malaysian university students. The study was a correlational research design using survey procedures in data collection. 187 respondents were involved in completing instruments by random sampling. They are netball players from universities all around Malaysia. Data were collected during two occasions; first, an inter-university level netball competition "Netball League" and second, through a sport meeting. Questionnaires were distributed using 'drop- and- pick- up- later' technique through the team managers. The data showed that the level of critical thinking dispositions were in moderate level. The mean score for CT dispositions were (Mean=23.31, S.D = 2.781). According to these findings, the level of CT dispositions were moderate for all subscales. Therefore, the students need more critical thinking activities to enhance their ability and skill.

Table 1. The mean and Standard deviation on critical thinking dispositions based on fields of study

Subscale	n	Mean	Standard Deviation	Min. Value	Max Value	Interpretation
Analitic	187	24.16	2.879	16	33	Moderate
Open minded	187	18.78	2.478	11	25	Moderate
Maturity	187	18.44	2.160	10	25	Moderate
Truth seeking	187	24.33	2.107	18	30	Moderate
Sistematicity	187	21.57	2.844	14	30	Moderate
Self Confident	187	33.53	4.369	21	45	Moderate
Inquisitiveness	187	22.34	2.631	11	30	Moderate
Total	187	23.31	2.781	14.43	31.14	Moderate

People or students can learn critical thinking as an independent skill of high intellectual capacity [22]. It includes the mental suitability of the actual details along with the reliability of the options, utilizing suggestion and evidences in order to make decisions for a reason, therefore it can be applied to a physical action. This kind of thinking has been linked to academic quality and talents such as making decisions, reasoning, creativity, debating, consideration of reflective, and problem solving [23].

Of course, the ability of critical thinking can also be beneficial in integrating content from different disciplines to physical education and aspects of life outside of education. The reason is that better critical thinkers assumed to make more informed and account table decisions, for example, healthy activities occur when identified problems more effectively, judge information, and draw conclusions carefully.

4. Instructor's Role in Physical Education Class

These days most P. E and other instructors utilize the old method of teaching model because they have more control of class or at least decision making. Instructors first identify the skills or concepts to teach; then they separate it into its elements, describe the way of performing a given duty, and later prepare a visual presentation. Learners can get these facts and collaborate with other students, go to the learning station, or just practice their own skills. Then instructor circulates, observes the performance of learning and provide corrective feedback. To summarize it, critical thinking is not expected nor encouraged in traditional method [3].

In a physical education class or any other class, if we want our students to show dispositions to attend critical thinking, then the instructors must establish and endorse the dispositional aspect of CT. For instance, if a university physical education instructor wants to teach the significance of teamwork playing and sportsmanship, this disposition can be explained and debated in class, students can be taught of some strategies to get together and to deal with situations in a way that they work together while knowing that working together is essential to the success of their activity [2].

The instructor has to make students aware of the spirit of sport to be sensitive to the behaviour of non-decent in game situations. It should be noted that a common mistake in moving towards a student-centered model of education is to make a very big leap too soon. They should guide students through the process of critical thinking in a non-threatening way [3].

5. Strategies to Foster CT in Physical Education

There are many opportunities for students and athletes to apply the four broad areas of critical thinking (compare and contrast, analyse, and evaluate), to the psycho-motor domain,

the trial is learning to identify when these opportunities become available. The instructor/coach must be able to recognize those situations in which students can apply critical thinking, assist those students/athletes through the critical thinking processes, and then must follow up on this process by asking the students questions that prompt critical thought.

Instructors and coaches can also challenge their students / athletes to think critically by providing opportunities for creative and independent problem solving. Opportunities exist in the sporting arena, such as allowing learners to think out a strategic plan or having them create a unique movement solution. Such strategies can be included in sport, fitness, and extra-curricular activities. As an example in sports and games we can expand on the games for understanding model, like utilizing the games for understanding model to teach strategic aspects of games. Allow students to think through and solve certain tactical aspects of a game. Have students think about similarities as well as dissimilarities across games, etc. Beside that we can ask students to modify the games so they are challenged to create situations that force players in a game to utilize a particular skill [19].

The other example suggests strategies in fitness or wellness classes like students writing. Using the concept of cardiovascular fitness as an example; for a wet weather programme students are asked to write continuously for three minutes on the topic "Why is cardiovascular fitness important?" Students are paired up to share their opinions and the class is brought together and a succinct list is created. Other fitness concepts can be explored/discussed in the same way. Or as part of a fitness or wellness unit, students are assigned to create a fitness programme for their own personal use. Areas included in this program include: cardiovascular fitness, muscular strength and endurance, flexibility, body composition. Students take part in their designed programme and measure outcomes over a period of time. Depending on the outcomes, students can reflect on their programmes effectiveness and can think through possible modifications.

Other propositions for fostering critical thinking in physical education are asking questions about the mechanics of the skill, applying previously learned knowledge via analysis (how does this machine move?). The students should know how to ask question about the criteria and to put their primary information in order to solve the question, and prepare the justification, then examine a physical activity based on the criteria and/or defend their movement solutions. They should try to improve their solutions according to a given set of criteria; and utilize the procedures of higher order thinking and finally evaluate the usefulness of the answer, and put on previous knowledge of fitness principles to a new situation.

A research has been conducted in order to investigate the correlation of critical thinking dispositions and passion among athletes in higher education institution. It was illustrated the harmonious passion in sport give impact on critical thinking disposition among netball athlete in higher

education. The result on Table 2 shows the highest correlation between harmonious passion and critical thinking disposition ($r = .240$, $p < 0.01$) as well as there is a low correlation between passion criteria with open-mindedness and systematicity ($r = .157$, $p < .05$). The types of passion criteria and harmonious passion have positive and significance correlated with both analyticity and open-mindedness. However, passion criteria and harmonious passion show no correlation at all with maturity and truth-seeking.

Table 2. Pearson's Correlation (r) between types of passion in sport and critical thinking disposition

Variable	Passion criteria	Harmonious Passion
Analyticity	.205**	.221**
Open - mindedness	.157*	.236**
Inquisitiveness	.124	.180*
Truth - seeking	.073	.040
Maturity	.094	.112
Systematicity	.157*	.093
CT-Self confidence	.092	.232**
Critical Thinking Disposition (general)	.183*	.240**

Note: * $p < .05$, ** $p < .01$

That means passion also be a contributor in CT disposition and it can be a strategy to foster CT. Since the harmonious passion is related to open-mindedness, analyticity, CT self-confidence, and inquisitiveness which are the dispositions for critical thinking. Consequently it can be understood from the article that athletes who are passionate of performing sport activities, they also show positive reaction to critical thinking dispositions. So if students show a strong tendency toward an action which they like most, they will devote a lot of energy and time to do it. If people do something passionately, possibly they expense and put all of their energies as well as performing critical thinking disposition to ensure in achieving target.

6. Conclusions

Critical thinking is essential to promote physical education students to help improve the knowledge, reasoning ability and self-regulated learning. The practical nature of physical activity allows the individual to apply a new strategy, attempt a new movement and evaluate the worth of the response almost immediately. Students can be challenged to produce unique solutions to movement problems, create new versions of a game, and think through issues related to fitness and health. Physical educators can foster CT by preparing an environment that stimulates the expression firmly, representing the role of knowledge and beliefs about teaching and learning, teaching and modeling critical thinking, provide satisfactory support for students, and the use of open tasks. In addition to helping students and mental

motivation, by encouraging critical thinking in physical education students gain the ability to apply challenges into their activities as well as other academic subjects and life.

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