

Teaching Critical Thinking Skills In The Psycho-Motor learning Learning Environment—A Possibility or a Passing Phase

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During the last five years there has been an explosion of interest in critical thinking. Brandt (1984) reports that education is seeing the beginnings of a major new movement promoting intellectual development. Never before in education has there been a greater push to teach children to think critically. Teachers, too, have identified improving thinking as their number one educational goal (Gallup, 1985). The purpose of this paper is to discuss some of the issues related to teaching critical thinking skills and suggest how they might be applied to the physical education setting.

Why the resurgence of interest in teaching critical thinking skills? Many simply believe that everyone should know how to think. Since available evidence suggests that many students have not mastered critical thinking, then the educational system should be held accountable for teaching it. Nickerson (1987) suggests that good thinking is a prerequisite for good citizenship. He believes that in a democratic society people are obligated to think deeply about "significant issues."

Perhaps one of the most compelling rationales for teaching critical thinking comes from the economists' perspective. Our society is presently entering an era of information processing. Naisbitt (1982) has stated that only thirty years ago approximately 17 per cent of the work force held

information related jobs. By 1982 the figure had risen to 60 per cent and by the end of the present decade may rise to as high as 75 per cent. Crosse (1984) has further estimated that by the early 1990's the amount of information generated will double every 20 months.

Brown and Saks (1984) point out that the largest volume of jobs in the next 50 years will be in the service sector. More and more jobs will involve supervision, evaluation, repair, and information processing. We need to be cognizant of the fact that functional literacy and numeracy (reasoning skills) are the basic skills of a service economy. To survive in this changing environment, workers will need higher-order thinking skills.

Consequently, pressure is being exerted on our schools to prepare students for these information processing jobs. Learning the fundamental skills of reading, sentence structure, and mathematics are not enough. Students will need to be able to perform higher-level skills of thinking in order to cope with this information explosion. We must identify ways and means of teaching students how to draw inferences, solve problems, analyze and synthesize facts; in short, to think.

From an historical perspective, research and interest directed toward critical thinking skills is not new. Dewey (1933) attempted to analyze reflective thinking and suggested that a problem was solved when the solver thought it was solved. Smith (1953) postulated that critical thinking was the correct assessing of statements. Ennis (1962) expanded upon this root notion

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and provided a 12-item list he felt identified a basic notion of critical thinking. Overall, little homogeneity existed as to exactly what critical thinking was and what it entailed. Perhaps, due to difficulties in conceptualizing critical thinking, interest in the topic waned.

Like the fashion world though, topics in education tend to come full circle. Once again, critical thinking has emerged as "the latest" topic of import—or educational bandwagon. Accompanying the renewed interest in critical thinking are a host of "new" definitions. Ennis (1985) has revised and expanded his definition of critical thinking as "reflective and reasonable thinking that focuses on deciding what to believe or do" (p.45). Other viewpoints consider critical thinking to include classroom discourse (Hultgren, 1987); intelligence (Baron, 1985); and scientific thinking (Tweney, 1987). Sternberg (1985) defined critical thinking as those mental processes, strategies, and representations people use to make decisions, learn new concepts, and to solve problems.

Apparently the ambiguity continues. Follman (1988a) believes that this continued ambiguity inhibits progress toward defining critical thinking. If a construct is clearly and concisely defined, then it becomes more specific and identifiable. The more specific the construct, the easier it becomes to assess, measure, and ultimately, easier to teach. To date, evidence suggests that critical thinking has not yet been established as a unique construct separate from language ability (Whimbey, 1985). Since no clear definition or way of assessing critical thinking has been established, the challenge continues to focus on the difficulty in knowing what to teach in order to enhance a student's critical thinking abilities.

One point on which all agree, however, is that critical thinking is not a simple uni-dimensional skill. Rather, critical thinking involves a number of related and often intertwined skills. Their complexity may be the chief stumbling block in the development of a parsimonious definition and construct of critical thinking.

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If there has been such difficulty in defining, identifying, and assessing critical thinking skills, is there any hope of their application to the psycho-motor setting? Perhaps. Not a resounding endorsement by any means; but there are some indicators that show promise for use in the gymnasium.

First, in a review of over 24 tests of critical thinking, Stewart (1979) identified several common critical thinking skills. These included deductive reasoning; evaluation of evidence offered in support of a statement; evaluation of arguments; recognition of unstated assumptions; and reliability of statements. If these skills could be agreed upon and operationalized, they might be targeted as salient skills to be taught to students.

Second, the nature in which critical thinking has been addressed in the literature is encouraging. Almost universally, critical thinking has been referred to within the context of specific skills. By implication, then, skills can be taught, evaluated, and learned. Physical education teachers already concentrate on teaching motor skills. The challenge is to be able to add the teaching of critical thinking skills to their repertoire. An ideal opportunity exists for physical educators to reinforce and build upon critical thinking skills introduced in other subject areas. Just as the fundamental motor skills of throwing, catching, kicking, and striking are taught in the gymnasium, so too could such fundamental critical thinking skills as problem solving, deductive reasoning, and testing hypotheses.

Finally, the vehicle for teaching critical thinking skills in physical education is already in place. McBride, Gabbard, and Miller (in press) use the concept of student centered teaching styles to foster critical thinking. The authors describe how students must be placed in a state of inquiry so the processes involved with seeking solutions are stimulated. During the process of discovery, or mediating solutions, key critical thinking skills such as assessing information, testing hypotheses, and problem solving are activated. Rather than the traditional Stimulus → Response (S → R) type of learning seen in the

demonstration/replication method of teaching, students are moved away from cognitive acquiescence (to accept passively) and toward active use of critical thinking skills.

Once the "Discovery Threshold" (Mosston & Ashworth, 1986) is crossed, the focus of the remaining teaching styles to indirect instruction. The guided discovery and divergent teaching styles are ideal for teaching critical thinking skills. Both styles allow the student to explore possibilities, synthesize information, evaluate arguments—in short, to employ critical thinking.

Although the future looks promising for teaching critical thinking skills in the psychomotor setting, there are some important issues to address. As has been mentioned, there is a significant gap in the literature when trying to identify a cohesive list of cognitive components of critical thinking. The work of Hilda Taba, Louis Raths, and Benjamin Bloom have been suggested as a starting point for this concern. Until these components can be identified, however, teaching critical thinking will continue to be a hit or miss undertaking.

Additionally, until critical thinking has been identified as a unique construct, measuring identifiable gains will also be difficult. Sternberg (1983) presents eight conditions that must be met if teaching critical thinking is to be successful. One condition calls for "careful empirical validations" on the effects of any critical thinking training program. Follman (1988b) agrees and calls for "independent, methodologically sound, replicated, research" on the teaching of critical thinking skills. If competent research is not conducted and reliable results obtained and replicated, the present bandwagon may grind to a halt. An earlier generation of scholars became disillusioned because of similar uncertain and inconsistent results related to measuring critical thinking gains.

In conclusion, then, providing effective instruction for teaching critical thinking skills presents a challenge to physical educators. Admittedly, scholars have not yet identified the most prudent route in which this may be real-

ized. Nevertheless, opportunities to exercise deductive reasoning, evaluate arguments, test hypotheses and so forth must be offered if we are to provide students with the skills necessary to cope in an information processing environment. Through the employment of Mosston's student centered teaching styles we have a start. Much still needs to be done. □

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