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# A Pedagogical Analysis of Critical Thinking Deployed by Health and Physical Education Teachers at the Secondary School Level

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**Abstract**

Background: Several pedagogical research studies acknowledge instruction in Health and Physical Education as being conducive to the development of critical thinking skills in students. However, little empirical research has focused on the presence of this form of thinking in Health and Physical Education (HPE) teachers. Yet according to various researchers in the field of pedagogy, the presence of critical thinking skills in the teacher is crucial to promote its development in students during the teaching-learning process. Objective: The present study is a follow-up of previous research examining the manifestations of critical thinking in teachers at the primary school level and is intended to identify expressions of critical thinking and define its role in the professional conduct of three Health and Physical Education (HPE) teachers (two men and one woman) at the secondary school level. Methodology: The theoretical framework for this study is based on the concept of critical thinking developed by Matthew Lipman. The procedure used in this study involved video recording nine health and physical education lessons delivered by the three teachers followed by nine semi-structured interviews with the teachers using the technique of stimulated recall. Result and discussion: The results indicated not only the presence of critical thinking in the teachers, but also that this form of thinking has multiple facets of expression. In terms of its function, critical thinking is essentially utilized as a genuine tool for teachers to evaluate the pertinence or viability of their instructional approach with students at the secondary school level.

**Keywords:** Critical thinking, Health and Physical Education, Teaching, Teacher Performance

## 1. Introduction

For more than two decades, numerous studies in the area of health and physical education have revealed an ever growing interest in the concept of critical thinking (Buschner, 1990; Côté, Shihui & Keppell, 2008; Daniel, 2001; Forges, Daniel & Borges, 2015, 2011; Hoper, 2010; Lodewyk, 2009; McBride, 1990, 1991; McBride, Xiang & Wittenburg, 2002; Waburton, 2004). While the body of research in this area, including both feature articles (Bergmann-Drewe & Daniel, 1998; Buschner, 1990; Daniel & Bergmann-Drewe, 1998; McBride, 1999, 1991; McBride & Xiang, 2004) and empirical studies Chen, Rovegno, Cone & Cone, 2012; McBride & Bonnette, 1995; McBride, Xiang & Wittenburg, 2002) is extensive, almost all of the researchers were primarily interested in the development of critical thinking skills in students at the primary school, secondary school, and post-secondary levels, particularly those enrolled in teacher training programs. To our knowledge, little attention has been given to in service HPE Teachers, with the exception of a few studies including those of Chen (2001), Cleland, Helion & Fry (1999); Kpazaï, 2015, 2004; Kpazaï, Daniel & Attiklemé (2011); and McBride & Knight (1993).

According to several researchers, the acquisition and development of critical thinking skills in students is largely dependent on the teacher's ability to foster these skills (Chen, 2001; Chen & Cone, 2003; Cleland, Helion & Fry, 1999; McBride & Xiang, 2004; McBride 1990, 1999; McBride & Cleland, 1998). As noted by the aforementioned researchers, through the adoption of attitudes, acquisition of critical thinking skills, and the creation of learning environments that are conducive to the development of critical thinking skills, teachers cannot only foster a higher quality of learning but also enable students to use critical thinking skills. Therefore, teachers hold the primary responsibility for the development of critical thinking in students. However, in order for teachers to properly assume this full responsibility, Gaskins (1994) emphasizes that it is vital for them to understand cognition, develop an awareness of the variety of cognitive strategies utilized, and be able to analyze the components of these strategies with a view to their instructional methods. According to Knight (1992), teachers who are concerned with helping their students develop adequate critical thinking skills must meet three requirements: 1) they must master the discipline; 2) they must know how to teach students to think; 3) they must possess various abilities related to critical thinking. Newman (1990) asserts that teachers must themselves be good critical thinkers in order to nurture the development of this skill in their students. This idea is further supported by Daniel (1998) who, in the goal of helping students to think, develop autonomy, and be analytical and open-minded, implores teachers to ask themselves whether they are a person who is not afraid to question themselves, who is always searching for plausible answers, and is interested in discussion and exploration.

Therefore, to concern oneself with the development of this style of thinking in students indicates a willingness to question the existence of critical thinking in teachers. Such an approach, according to Pallascio, Daniel and Lafortune (2004), is a necessary condition for scholastic achievement. In the spirit of this view, the present study attempts to answer two questions: 1) Do HPE teachers at the secondary school level demonstrate critical thinking skills in teaching; 2) If so, what meaning can be deduced from this deployed critical thinking through its various manifestations?

### *1.1 Theoretical Framework*

The theoretical framework for this study is built on the concept of critical thinking put forward by Lipman (1991, 1995, 2006). For many researchers who study the process of critical thinking, Lipman's (1991, 1995, 2006) ideas have the advantage of providing indicators for critical thinking (Lafortune & Robertson, 2004; Roy, 2005). According to Lipman (1995, 2006), not only is critical thinking not a finality, but rather a means of reaching a good judgment, it must also meet three characteristics: 1) it must be based on criteria; 2) it must be sensitive to context; 3) it must be self-correcting.

#### 1.1.1 Feature 1: Based on criteria

For Lipman (1995), critical thinking is at the same time a way of thinking that utilizes criteria and one that exists by resorting to criteria. Without criteria, critical thinking would be arbitrary, haphazard, and unstructured. However, a thought process supported by criteria renders it solid, justified, structured, and well-reasoned. The criteria are therefore essential because they give it significance. In fact, the criteria are presented as rules or principles that allow an individual to take on a more objective approach to judgment. For example, Gagnon (2010) suggests that teachers justify their students' achievement results by the criteria they used to arrive at their final evaluation of the student's performance. Thus, critical thinking constitutes a cognitive responsibility and requires teachers to clearly state the criteria they use in decision-making.

#### 1.1.2 Feature 2: Sensitivity to context

Sensitivity to context presumes that the critical thinker recognizes the particularity of each case and each context, and is careful to respond in an appropriate and viable manner. Therefore, the feature "sensitivity to context" leads to thought that is flexible when it comes to putting theory into practice, refuses to attribute normative character to principles and facts, and firmly engages in a process specific to each context. Different contexts require different applications of rules and principles, as the context may be situational, that is to say physical or theoretical (epistemological).

#### 1.1.3 Feature 3: Self-correcting

Critical thinking is self-correcting in the sense that it invites each individual to discover their own weaknesses and errors, to be sensitive to one's own limits, and be inclined to self-correct. However, self-correction is not spontaneous but occurs gradually throughout the process of reflective investigation.

For Paul (1990), the self-correcting dimension of critical thinking gives it powerful significance, to the extent that this dimension illustrates a careful consideration of alternatives and different perspectives thus leading the individual to remain open to the possibility of modifying their original ideas and even their behavior. As for Daniel (2005) and Lipman (2006), the characteristic of "self-correction" is a key element in the exercise of critical thinking because the critical thinker acknowledges their fallibility and this awareness is accompanied by a genuine desire to improve their perspective. Presented below in Table 1 are some indicators of the characteristics of critical thinking as identified by Lipman (1991, 1995, 2006) that have been adapted to the teaching of Health and Physical Education.

Table 1. Indicators of characteristics in critical thinking

| **Characteristics of critical thinking** | Indicators of characteristics |
|---|---|
| Search for criteria | - Search for the reasons underlying the issuance of a learning technique or of a pedagogical action.<br>- Supported by criteria. |
| Sensitivity to context | - Question the characteristics of the educational environment.<br>- Modify an instructional technique in light of the characteristics of the learning environment (e.g. characteristics of the students, time allotted for instruction, characteristics of the didactic material, etc.).<br>- Modify pedagogical communication as a function of the cognitive characteristics of students (e.g. students at the primary versus secondary school level; the students' familiarity with the course of action, etc.).<br>- Take into account the specificity of Health and Physical Education versus sport in the presentation of learning situations and in the issuing of instructions.<br>- Show distinction in the foundation of instructional actions.<br>- Recognize differences and similarities. |
| Self-correction | - Examine the quality of one's pedagogical approach.<br>- Question the validity of the remarks that are made.<br>- Analyze the effects of one's instructional approach in order to make changes if it proves to be irrelevant to student learning.<br>- Modify an operating principle in the light of new data (new criteria, new context, etc.).<br>- Recognize the irrelevance of a learning situation proposed to students in light of their motor performance.<br>- Evaluate one's own judgment and seek correction when appropriate.<br>- Evaluate the pertinence of a learning situation and modify it accordingly to benefit the students.<br>- Identify or detect errors in one's own judgment or thinking. |

The table 1 shows some indicators of the characteristics of critical thinking in Health and Physical Education setting.

## 2. Methodology

### *2.1 Research strategy*

Since our goal was to understand if the form of thought employed by teachers during the teaching-learning process was in alignment with critical thinking, we opted to use a qualitative hermeneutic approach (Deslauriers & Kérisit, 1997; Huberman & Miles, 1991; Van der Maren, 1995; Yin, 1994).

### *2.2 Participants and research setting*

Two male teachers and one female teacher voluntarily participated in this study. At the time when this research was conducted the teachers all had varying years of experience teaching Health and Physical Education (eight, thirty, and five years respectively). All three teachers were employed within two private secondary schools located in an urban community of Montreal, Quebec. These *a priori* differences (sex, years of experience, and schools) allowed for a better understanding of critical thinking in the practice of teaching (Beau, 1995; Van der Maren, 1995). (See the Table 2 below).

Table 2. Characteristics of the teachers

| | Teacher A1 | Teacher A2 | Teacher A3 |
|---|---|---|---|
| Gender | Female | Male | Male |
| Level of experience | 5 years | 30 years | 8 years |

The table 2 indicates the characteristics of the participants.

*2.3 Data collection and control strategies*

To ensure internal validity, the data was collected using one instrument and five strategies to control the accuracy of the responses. The instrument used to collect the data was the interview with each teacher and the strategies consisted of the following: 1) pre-class interview, 2) post-class interview, 3) non-participant observation and video-recording of teaching sessions, 4) stimulated recall, and 5) participant feedback. This methodology corresponds to the demands of qualitative research as indicated by Deslauriers and Kérisit, (1997) in their explanation that qualitative research generally uses participant observation and interviews as a primary means of collecting information. These basic techniques are completed using various methods such as questionnaires, photography, audiovisual materials, observation in public places, biographical information, and content analysis. Depicted below in Table 3 are the various steps used in the data collection process with the participants in this study.

Table 3. Strategies and data collection instrument

| Procedure | Goals | Duration |
|---|---|---|
| 1. Pre-lesson interview | - Gather information regarding each teacher's instructional goals and the objectives of the session. | 5 to 10 minutes |
| 2. Non-participant observation (*in vivo*) and video recording of teaching session | - Collect information in relation to the interventions (actions and behaviors) of the teachers.<br>- "Live" the reality of the teachers' experiences.<br>- Video-record the teachers' interventions. | 50 to 70 minutes |
| 3. Post-lesson interview | - Immediately after the teaching session, confer with the teacher to obtain their impression and evaluation of how the session went explore any different choices for the future.<br>- Remind them of the meeting date for the stimulated recall session. | 5 to 10 minutes |
| 4. Simulated recall session and semi-structured interview | - While viewing video clips of the teaching sessions, ask the teacher about the rationale underlying the teaching practices used in these sessions.<br>- Interviews were audio-recorded on tape. | 60 to 90 minutes |
| 5. Teacher feedback | - Read the transcriptions from the audio recordings of the interviews with the teachers in order to validate them and provide, if necessary, any clarifications and additions.<br>- Discuss any additions to the interview with the teacher.<br>- Correct the transcription if necessary.<br>- Obtain the corpus on which the data analysis will be completed. | Variable Duration |

Table 3 above describes the five stages of data collection processes that have been used by researchers

*2.4 Pre-class interview*

Prior to every teaching session, the principal investigator met with the teacher to obtain further information about the learning activities that were planned and the objectives for lesson. The teachers were asked the following questions: *What will you do with your class today? What do you want to develop in today's lesson? Why did you choose this particular educational goal? Is there a particular reason for this instruction? What instructional methods do you want to use with your class today?* This interview had an average duration of ten minutes. The information collected was noted on an index card from a pre-established session.

*2.5 Non-participant observation and video recording of teaching sessions*

In order to minimize disruption to the progress of the teaching-learning sessions and ensure that the teachers' behavior would not be affected, the primary researcher used a non-participant observation method with each teaching session. The researcher was positioned at a reasonable distance from the teaching platform in order to have a broader field of vision, which allowed for the observation of the entire class.

To complete the observation of the teacher's actions and behaviors throughout the teaching-learning process, and as a result increase the internal validity of the data, observation with technical support (Van der Maren, 1995) was added to

the non-participant observation. Three video recordings of the lessons for each teacher were made over a period of three weeks, at a rate of one recording per week. The recorded sessions had an average duration of 50 to 70 minutes depending on the length of the Health and Physical Education class. The video recordings were made using a battery operated VHS camera affixed to a tripod. The participants were given a lapel microphone so the statements they made throughout the lessons could be fully heard, but also to allow them to move around unhindered.

*2.6 Post-lesson interview*

The post-lesson interview was held immediately after the observation and recording of each lesson given by the participants. The purpose of this meeting was to obtain the teacher's initial evaluation of the lesson and the course of action the teacher planned on using in the next lesson as well as the justification for the new approach. The teachers were asked the following questions: *Were you able to achieve your goal for the lesson and complete all of the planned activities? Did you make any adjustments? What do you plan do to with the students during the next lesson and why?* The teachers' responses to these questions are listed in the researcher's session notes.

*2.7 Stimulated Recall*

The technique of stimulated recall consisted of reviewing, with the teachers, the video recordings of what they did and afterwards, collecting data on what they were really thinking at the time of their actions. Through this technique, participants were able to more easily and retrospectively, reconstruct the thoughts, decisions, and reasons that led them to behave in a certain manner.

*2.8 Semi-structured interview*

Three semi-structured interviews were conducted with each of the three teachers for a total of nine interviews. Each interview took place during the stimulated recall sessions, no later that two days after the video recording of the teaching sessions. The interviews were 60 to 90 minutes in duration and were audio-recorded on tape. The interviews were conducted based on a grid composed of characteristic elements of critical thinking as described by Lipman (1995, 2006). This method ensured that all of the components important to the research thematic were addressed during the interview (See Table 4).

Table 4. Interview guide for stimulated recall sessions

| **Characteristics of critical thinking (Lipman, 1995, 2006)** | | |
|---|---|---|
| **Based on criteria** | **Sensitivity to context** | **Self-correction** |
| - Do you create a formal plan for each lesson, and if so, based on which criteria?<br>- On what criteria do you base your pedagogical interventions?<br>- What are your particular reasons for choosing the criteria? | - Why did you act in such a way here whereas your behavior was different before?<br>- Do you use X (strategy, intervention, etc.) in all Y (contexts, all situations with all groups of students, etc.)?<br>- At that moment, why did you employ that particular strategy?<br>- Do you make frequent adaptations? | - What are the limitations of this method of instruction?<br>- Do you often make corrections following the motor performance observed in your students?<br>- Why did you change your teaching method after a few minutes of student practice? |

The table 4 illustrates the guide used for the semi-structured interview during the research.

*2.9 Participant feedback*

Feedback is a methodological strategy in qualitative research that consists of validating data from the very participants from which they were collected (Boudreau, 2001). Thus, after each stimulated recall session the principal researcher fully transcribed the content derived from the semi-structured interviews, and then gave the transcripts to the teachers for verification. The teachers were encouraged to comment on both the form and the substance of the transcription. The teachers could also add to their thoughts if they believed it was necessary. Therefore, the transcription used in the analysis was validated by each participant in the study.

*2.10 Data analysis*

The analysis strategy for the corpus collected proceeded on the basis of a content analysis, and in an inductive manner (L'Écuyer, 1987). The procedure for data analysis was completed using four steps: 1) coding of data, 2) vertical analysis of the data from the interviews with each teacher, 3) horizontal or cross-sectional analysis of the data collected

from all the teachers, and 4) decipher elements as to the nature and meaning of critical thinking in the practice of these HPE teachers.

*2.11 Coding of data*

Once the transcriptions of the nine semi-structured interviews were completed and validated by the teachers, we proceeded to the coding of the entire content. This codification was completed based on an analysis grid that was developed taking into the account the three primary characteristics of critical thinking as identified by Lipman (1991, 1995, 2006). A closed coding adapted to teaching behavior was conducted for the analysis of this form of thought. It must be noted that only the elements from the characteristic "presence of criteria" were adapted to the teaching methods in Health and Physical Education. Therefore, when coding the corpus, we identified units of meaning corresponding to the form of critical thinking, that is to say, informational units on "self-correction", or on "sensitivity to context", or on the "presence of criteria". Although a number of transcriptions were coded separately by both researchers, the level of inter-rater reliability was 90%, which is deemed acceptable according to Huberman & Miles (1991) who suggested a level of 85% inter-rater reliability as an appropriate threshold.

*2.12 Outlining the definition of the nature and meaning of critical thinking in action*

Outlining the definition was done in two stages, by the analysis and processing of data, the first level being at that of each teacher. At this level, we tried to understand the functioning of critical thinking in education by highlighting the practical manifestations of the components of critical thinking while trying to explain them as they appeared. Secondly, following this interpretative approach to the data for each teacher, we proceeded to the horizontal analysis. At this level, we first sought to highlight the similarities and differences in terms of the form of critical thinking by comparing the data from each teacher. This two-step analysis enabled us to extrapolate the meaning of critical thinking in the methods used by the teachers.

## 3. Results

In this section, only the analysis of the results of the semi-structured interviews via simulated recall will be presented. The video-recorded lessons were not analyzed for they were only intended to stimulate the teachers' recall in order to conduct the interviews. The presentation and analysis of the results will be made in accordance with the characteristics of critical thinking developed by Lipman (1991, 1995, 2006) as shown in Table 5.

Table 5. Teachers' expressions of thought

| | Units of meaning related to presence of criteria | Units of meaning related to sensitivity to context | Units of meaning related to self-correction |
|---|---|---|---|
| Teacher A1 | 5 | 12 | 11 |
| Teacher A2 | 3 | 19 | 9 |
| Teacher A3 | 7 | 22 | 19 |
| Total | 15 | 53 | 39 |
| Percentage | 14% | 49.5% | 36.5% |

The table 5 above illustrates the importance of each of the characteristics of critical thinking in the professional conduct of the participants.

Overall, the results clearly demonstrate that the three teachers employed critical thinking techniques in their interactions with the classroom groups. In effect, the analysis of their thought process reveals the presence of three critical thinking characteristics: presence of criteria, sensitivity to context, and self-correction. However, as shown in Table 5 below, the degree to which each feature is present is highly variable.

According to Table 5 above, 36.5% of the units of meaning relative to Lipman's (1991, 1995, 2006) concept of critical thinking are related to the feature of "self-correction". This signifies that the teachers demonstrate an accommodating and flexible form of thought as well as an informal logic, all with the intention of self-adjusting and adapting in order to apply viable pedagogical actions. This indicates that they recognize not only the vulnerability of their thinking, but they are prone to self-correct or to recognize the incompatibility of their first thoughts, and also acknowledge their own errors in order to correct them for the benefit of student learning and development. Below are some examples of self-correction in the teachers' thinking as evidenced in the following statements.

> ***Today I brought in some pictures to display to help the girls find elements related to gymnastics activities. I have not done this before****. But a Health and Physical Education class is a class like any other, and you can add things each time to improve your course. For example, every year I make a lesson plan. But this outline does not remain as originally drafted when I teach. I make gradual modifications as needed based on the students' behavior. I rework it every time.* (A1e3, p.9)

> ***Yes, I changed my plans on the field because I do not necessarily want it to be as outlined in my lesson plan****. This is not my course, it is that of the students. Where we, as teachers, are more direct is in the choice of instruction methods. Even in this area, I still allow students to express themselves.* ***Sometimes the students will tell me that they do not want to use the horizontal bar and will ask for another activity. In this case, I integrate basketball into the lesson. I originally planned to just do the gymnastics, but I made room for basketball when I saw that the first activity was tedious for the students****.* (A2e1, p.4)

> ***In the process of planning my course, I intended to remove the action of clapping my hands when asking for the ball. But in this course, I found that introducing this signal at that moment was important even if I had not stated the action at the beginning of the class and I had not planned it either****. However, to enable the students to work better and to think more carefully when carrying out the assigned task, I had to add constraints. The holders of the ball will be obliged to see all of their teammates and analyze their positioning before making passes. Therefore, this will eliminate emotional and spontaneous decisions.* (A3e3, p.6)

In the first excerpt of the transcription, teacher A1 indicates that she included a break in the usual way of conducting the lessons. Not only does she deem the teaching strategy she previously used to be inefficient, but she also offers an addition in view of making an improvement. Thus, according to this excerpt, teacher A1 amended her strategy by introducing a new visual teaching aid (the displayed pictures) that facilitated the students' learning of gymnastics.

The idea of change or flexibility in thought is reflected differently in the second excerpt of the transcription for teacher A2. According to this teacher, the focus during the teaching-learning process should be on the students, who are at once, beneficiaries and proprietors of the Health and Physical Education course. This second function of the students requires that the teacher to listen to them and consequently incorporate physical activities and sports, that were unplanned, but suggested by the students.

Regarding the third transcription excerpt, the characteristic of self-correction is manifested in teacher A3 by the hasty addition of an unforeseen constraint for the day's session. Following the analysis of the students' behavior and the learning situation, teacher A3 is obliged to impose a new constraint that had not originally been planned for the course. For him, this new, unplanned instruction is necessary to develop reflection in the students and to suppress emotional and thoughtless behavior in the completion of assigned tasks.

In sum, when the teachers are faced with situations that provoke cognitive dissonances that consequently lead to a re-evaluation of the hypotheses underlying their implementation, these professionals consciously disconnect from their initial thoughts. This willful and conscious turnabout is done solely with a view to improving the teaching-learning process.

*3.1 Sensitivity to context*

As previously noted in Table 5, of the three characteristics of critical thinking put forward by Lipman (1991, 1995, 2006), "sensitivity to context" is the one that presents itself most often in the excerpts from the transcriptions of the teacher interviews (49.5% of the units of meaning are related to this feature). This suggests that these educators demonstrate adaptability in their thinking that recognizes the uniqueness of each context. According to our analysis, the application of the practical rules for educational activities, the pedagogical principles of organization and classroom management, and the organization of the material do not apply in a mechanical and identical manner to all contexts of teaching. In their teaching practices, these teachers take into account the particularities of the various educational contexts. Therefore, they will be sensitive to the psycho-socio-cognitive features of the learners, to the nature of the Health and Physical Education class itself, and to the process of planning the lessons for the year. Below are some examples of statements that illustrate how "sensitivity to context" is manifested in the teachers' thinking.

> *I gave an extended reminder here to help put them back into the context.* ***They only have one course at the beginning of the week and the next course at the end of the following week, so there is a long time span between classes, even more so since they are in Secondary 1****. They do not always understand the concepts and they do not necessarily remember what they did the previous week if we do not stimulate their memory.* (A1e1, p.9)

> *No! For me,* ***a teacher is not an applicationist. I see this in part in an elitist framework because there we have to be much more of a perfectionist. But here it is not at all in this context. We are dealing with basic educational training****. I have a heterogeneous class, an amalgam of individuals with different competencies, not all of them having the same interests or the same abilities. Within an elitist setting, I would have a very rigid framework that I would rarely step out of because I would aim for performance, but not here. This is what influences my behavior.* (A2e3, p.12)

> ***I asked the students to make a certain number of passes before they could shoot for the basket. This would slow down the pace of the game and enable those students who were having difficulty to better see the game, as well as receive passes****. In fact, because they have difficulty dribbling, the students with fewer skills do not receive passes from their more competent peers. We must therefore ensure that they have the chance to get the ball.* (A3e2, p.5)

The above-noted transcription excerpts demonstrate how sensitivity to context is manifested in the thinking of the three teachers. In the first excerpt, teacher A1 justifies the length of the instructional reminder by taking into consideration two particularities of the educational context: the length of the interval between the two Health and Physical Education classes and the cognitive features of the students (limited knowledge and frequent memory lapses as to what was accomplished in the previous lesson). It is impossible for her to be indifferent to such realities of the learning environment if she wants to see her students learn.

In the second extract from teacher A2, both the nature and objectives of Health and Physical Education represent guiding factors in his professional conduct. For him, Health and Physical Education represents "basic education" and not "elitist training". It should enable all students in the class, a fundamentally heterogeneous class, to learn new concepts and skills. Therefore, his professional conduct is situated in regard to the very essence of Health and Physical Education.

The third excerpt of the transcript refers to the sensitivity displayed by teacher A3 towards students who are having difficulty. In fact, the more inclusive pedagogical approach can be explained by a desire to help the students who are less skilled on a technical level have access to the balls and thus acquire learning opportunities. According to the statements made by A3, the instruction given for students to make several passes to their teammates before shooting for the basket is justified in order to help the students who are struggling with the activity. The pedagogical approach of this educator takes into account the development of technical skills in certain students.

It is evident in the three excerpts above that the pedagogical practices of the teachers are motivated by an awareness and consideration of various factors specific to each learning environment. This sensitivity to context, one of the criteria in critical thinking according to Lipman (1995, 2006) is oriented toward student learning and development.

*3.2 Presence of criteria*

According to Table 5, presence of criteria is evident in the data regarding the rationale behind the professional conduct of teachers. Fourteen percent of the units of meaning related to critical thinking are linked to this third characteristic. A horizontal analysis of these units of meaning reveals that for these teachers, the criteria are "reasons" that justify their teaching practices. These criteria serve as a point of reference for teachers to either compare students or evaluate their motor skills. In the end, these criteria respond to a dual nature: technical (how to dribble, make passes; the quality of technical movements, the quality of reproduction, etc.) or socio-ethical (socialization within the educational group, respect for peers, respect for procedural instructions, observing safety precautions, demonstrating fairness, etc.). The three excerpts below exemplify how the presence of criteria is manifested in the teachers' thinking.

> *I have specific criteria that guide my observations and actions. For example, when the students go to retrieve equipment from the storage room,* ***I expect that they will take the right path in the room because they could get caught on the posts or get pushed around or bump into something****.* (A1e3, p.4)

> *When I tell my students that things are going well, it is a function of the criteria and guidelines established at the beginning.* ***For example, in water-polo, we establish tasks: you should find yourself in the game with five people having well-established positions and respecting certain rules. I see that they complied with this. We have the correct number of players on the game, we determined the tasks, and we can clearly see the layout of the game****. It is always in regard to the objectives that we set.* (A2e1, p.11)

> ***The criteria that allowed me to say "well done" with respect to the motor performance of this student is that he changed directions and extended his hand to receive the ball****. This is what I wanted the students to do in this situation. He was able to make that change in direction and extend his hand.* (A3e2, p.8)

In the first excerpt of the transcript from teacher A1, the criterion evidenced by the teacher here is of a socio-ethical nature, namely, respect for safety. For A1, there is no designated "one way" that the students can use when retrieving the needed equipment for the class. The implicit criterion of the teacher is the students' respect for safety. For this teacher, any behavior or collective procedure performed by the students that shows respect for this principle is generally acceptable.

In contrast, for teacher A2 the criterion put forward is of a technical nature in connection with the production of a collective technical strategy. The teacher does not dictate precisely what the students need to do but rather expects them to demonstrate collaborative behavior that conforms to the objectives of the session.

In terms of the excerpts from teacher A3, the criterion emphasized is of a technical nature: the execution of relevant motor behavior in relation to the technique of freeing oneself in order to receive the ball. The teacher will therefore use the quality of duplication of this technique as a baseline for comparing the students.

It should be noted that all of these reasons that constitute the criteria for the thought process of the teachers are not related to values, but rather to the technical aspects of teaching and learning. These are subjective or personal criteria in the thinking of the teachers. However, their presence in the professional conduct of these teachers suggests that the type of thinking used is of a critical nature in the sense that they resort to criteria to compare their students.

## 4. Discussion

What pedagogical interpretation can be extracted in terms of the role and form of critical thinking based on its manifestations in HPE teachers at the secondary school level? To answer this question, we will proceed to a discussion of the results obtained at the level of each characteristic of critical thinking as described by Lipman (1991, 1995, 2006), namely, 1) self-correcting thought, 2) thinking that is sensitive to the context, and 3) thinking that is governed by criteria.

### *4.1 Self-correction*

Data analysis for the characteristic of "self-correction" indicates that these three teachers question the initial thinking behind their teaching practices. This concern for self-questioning is of particular importance to the professional conduct of these educators. In effect, this "pedagogical turnaround" is not only necessary in the development of their competence (Schön, 1987, 1994), but also to the formation of relevant professional behavior. In accordance with previous research by Daniel (1998) and Lipman (1991, 1995, 2006), the analysis of the data in this study suggests that these teachers not only adopt an investigative posture, but also demonstrated a spirit of openness in terms of their own perspectives and their educational process. Moreover, analysis of the manifestations pertaining to this characteristic indicates that the teachers are not only motivated by a search for a sense of conformity or viability in their pedagogical actions (Lipman, 1995), but they are also attentive. According to Pallascio, Daniel, and Lafortune (2004), this distances them from a certain amount of intellectual rigidity, drawing them closer to intellectual freedom.

### *4.2 Sensitivity to context*

According to our analysis, the primary goal of this feature is to allow the teachers to solve a problem when confronted with an uncomfortable educational situation. However, this reconstruction inevitably occurs through the understanding of the complexity of the educational context. Thus, in contrast to the positivist and technocratic visions of education, the situations of cognitive dissonance encountered by the teachers do not present themselves as simple situations that cannot be contextualized and problematized. For these educators, there are no preconceived solutions to these problematic situations. Therefore, they feel obliged to structure the problem through the understanding of the indeterminate elements of the situation and the context in order to provide a coherent solution to the problem encountered.

Moreover, it can be postulated that the presence of the "self-correction" feature in the thinking of these professionals reveals a certain degree of open-mindedness with regards to their limits, thus an inward focus, whereas the feature "sensitivity to context" suggests an outward orientation in their thinking, towards others. In effect, taking into account the characteristics of the physical environment (features of the gymnasium, location of the session, the amount of time allocated to the session, etc.), the nature of Health and Physical Education (academic discipline, basic training for all students, physical activities that are open to all, that is to say non-elitist, etc.), and most importantly, the characteristics of the learners (their degree of familiarity with the physical activity being taught, their psycho-socio-motor skills, cognitive development, etc.) in the design of their teaching practices emphasizes their concern for the quality of their pedagogical acts. Therefore, they teach with the intent that their students will learn. By this very fact the presence of this characteristic (i.e. sensitivity to context) demonstrates their concern for student learning. At this level, we could infer that the socio-centric perspective of critical thinking, through the strong presence of the characteristic "sensitivity to context", suggests that these educators subscribe to a "strong sense" of critical thinking (Paul, 1992). It is in this sense that Buschner (1990), Chen (2001), and Rovegno (2000) point out that concern for the problematization of a learning situation is to seek to understand the situation with insight and courage, which they see as an important skill in critical thinking.

### *4.3 Presence of criteria*

With respect to the professional conduct of the educators in this study, the data previously presented and analyzed revealed the presence of criteria underlying the educational practices of the teachers. However, in all the teachers examined, the presence of this third criterion of critical thinking is relatively weak (14% of the units of meaning are in relation to critical thinking, see Table 5). Yet, if for Paul (1992) a strong sense of critical thinking is expressed in altruism, for Lipman (1991, 1995, 2006) the presence of this criterion is fundamental to critical thinking in the strong sense. Lipman (1995) affirms that critical thinking uses criteria and at the same time exists by resorting to criteria. Although this characteristic is rarely exhibited among the teachers, it is possible to question the robustness of their critical thinking (Kpazaï, 2004; McBride, 1991). In effect, this attribute would avoid qualifying the judgments or decisions of these professionals when made in an intuitive and gratuitous fashion. These criteria are, therefore, essential to critical thinking because they give it significance (Lipman, 1991, 1995, 2006).

Moreover, if Lipman (1995) perceives critical thinking to be a cognitive responsibility for the teacher, in the sense that they feel an obligation to openly provide their own criteria to opinions and to attenuate the development of students' intellectual autonomy, the results of this study reveal that the judgments of these educators are based on only a few, clearly identifiable, criteria, thus weakening the critical nature, even the form, of their thinking. The scarcity of the characteristic "based on criteria" could suggest that these teaching professionals would behave in a "quasi reflective" (versus "reflective") manner, as noted by King and Kitchner (1994), who drew their inspiration from the epistemology of Dewey (1933). Therefore, these teachers would not be preoccupied so much with the *why* underlying their judgments when interacting with their students, but rather the question of *"how"*.

If we look at the nature of the few criteria that underlie the judgments of the teachers in the teaching-learning process, we find that it is twofold. The analysis of the data reveals that some are technical in nature (gestures, motor skills reproduction, quality of the motor performance, etc.), whereas others are of a socio-ethical nature, therefore representing values such as socialization, group diversity, and fairness. However, the data suggests that the functions performed remain the same regardless of the nature of the criteria. All the criteria issued served as a basis for comparing and evaluating the motor performance of students.

## 5. Conclusion

The present study had two main objectives: 1) determine to what extent critical thinking is present in secondary school level HPE teachers during the teaching-learning process; and 2) describe the function of this kind of thinking in teaching if it is utilized by educators. In view of the results of this study, it can be concluded that the participating teachers demonstrated critical thinking because all of the characteristics of this form of thinking as defined by Lipman (1991, 1995, 2006) were present. However, these characteristics were of differing importance in the practice of the three teachers. If the characteristic of "sensitivity to context" is more dominant and the characteristic of "self-correction" offers an acceptable presence, it is clear that the same quality that determines the critical aspect of critical thinking, that is to say the presence of criteria underlying the judgment of these HPE professionals, is poorly represented. The criteria provided by the three teachers are not all conceptual in nature (i.e. not all based on values), but they are mostly technical in nature, that is to say, based on facts and gestures.

In terms of the function or utility of the critical thinking skills manifested by these teachers, the analyzes reveal that the characteristics of critical thinking are presented as support elements on which these teachers rely to try and give relevance to their educational intervention. Thus, these educators make an effort to learn about the characteristics of the educational context (meaning that they are "sensitive to the context") to help them resolve problematic educational situations. Furthermore, they call upon the "self-correction" feature of critical thinking to make them aware of their vulnerability and to place themselves in the perspective of improving their teaching practices. When they rely on "criteria" or "principles and reasons", the want to render their decisions robust, that is to say not taken in an intuitive or gratuitous manner. Thus, the critical thinking ability displayed by these teachers is mainly seen as an indispensable tool for the quality of education and therefore useful in promoting student learning.

The present study was limited to examining the form of critical thinking (Lipman, 1991, 1995, 2006) utilized by HPE teachers in two urban private secondary schools. To further understand the concept of critical thinking and its perception among teachers, future research could be undertaken with the inclusion of the following elements: a) a substantial increase in the number of participants in order to move from a case study to research on a larger scale so as to ensure the representativeness of the results; b) the study could focus on both the form and content of the critical thinking skills practiced by HPE teachers. Finally, it would also be interesting to pursue further investigation comparing the form and content of critical thinking between HPE teachers and those specializing in the teaching of other subject matters. This would enrich our understanding of critical thinking in teachers and make associations with the training programs for teachers in different disciplines.

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