CRITICAL THINKING AND CONSTRUCTIVISM: MAMBO DOG FISH TO THE BANANA PATCH

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In which of the following constructivist classroom practices is there evidence of critical thinking?

Example 1

'A class of grade ten students arranged themselves in…groups…They were involved in a group translation into contemporary English of Julius Caesar, each of five groups translating a different act. In their attempts to modernize and present Shakespeare's work, students were required to come to an understanding of characters and events in the play, which would determine verbal and nonverbal representations. Later, the students would enact, in full costume, one scene of their choice from their contemporary constructions, with the remainder of the scenes to be presented in a readers' theatre. While the costumes for the enactment would be contemporary, the students had to make decisions regarding the most appropriate costumes for each character based on their own interpretations of and transactions with Shakespeare's text. The exercise was…an experience from which they would come to an understanding of linguistic evolution and character development (Gray, 2007).' From Constructivist Teaching and Learning, Part 2, Constructivist Learning and Teaching, A Classroom Example of Constructivist Teaching.

Example 2

'…three groups of students were working on various reading tasks: two groups were doing assignments related to their novels, and one group was involved in a literature discussion group with the teacher. Each group was reading a different novel…The observation focused primarily on the discussion group. It is useful to note, however, that the two other (independent) groups were involved in meaningful projects related to their books, since this is often a weakness of differentiated group instruction. Some students were working on 5-paragraph essays (responding to a series of questions about their novels), some were illustrating their essays, and others were designing a 20-word crossword using vocabulary words of their choice from the novel. Nearly every student appeared to be engaged and focused on a meaningful task. As the observation began, a literature circle group of 11 students was discussing their novel (unknown, 2005).' From Sample Classroom Observation: Constructivist Teaching.

Example 3

'A middle-school language arts teacher sets aside time each week for a writing lab. The emphasis is on content and getting ideas down rather than memorizing grammatical rules, though one of the teacher's concerns is the ability of his students to express themselves well through written language. The teacher provides opportunities for students to examine the finished and earlier drafts of various authors. He allows students to select and create projects within the general requirement of building a portfolio. Students serve as peer editors who value originality and uniqueness rather than the best way to fulfill an assignment (pkab, 2008).' From Constructivism as a Paradigm for Teaching and Learning (Part 3).

Answer: None of the above.

Introduction

Critical thinking is experiencing unprecedented popularity—it's ubiquitous in traditional educational arenas, trumpeted as a 'Core Competency' in for-profit educational institutions (e.g., The University of Phoenix, DeVry University), and even found at the centre of prison inmate interventions (Boghossian, 2010; Porporino, Fabiano, & Robinson, 1991; Ross & Fabiano, 1991). Constructivism is an unrelated and popular educational phenomenon that has taken root in the last 30 years in contemporary education (Brooks & Brooks, 1993; Lord, 1998; Richardson, 1997; Wolffe & McMullen, 1996; Willingham, 2007). The purpose of this paper is to argue that constructivism and critical thinking are at odds with each other. With regard to critical thinking, a strict constructivist pedagogy cannot achieve its critical thinking ambitions (Menssen, 1993). I will argue that beyond not providing an environment that nurtures critical inquiry, constructivism, and constructivist epistemological presuppositions, can actively thwart the critical thinking process.

To substantiate this claim, first I'll provide definitions and explanations of constructivism and critical thinking. Second, I'll discuss the core arguments of my paper, which revolve around corrective mechanisms and the ability to correct a student's propositions and cognitions against the background of a shared, knowable world. At the end of this section, I'll provide concrete examples of actual constructivist practice and show how one constructivist classroom exercise can be modified to incorporate critical thinking elements as detailed by the American Philosophical

Association. Finally, I'll state the significance of the arguments in this paper, particularly as they extend from the educational arena into the public and governmental domains.

Constructivism

Epistemological Constructivism

Constructivism is not a single doctrine, but families of epistemological and pedagogical views (Abdal-Haqq, 1998; Boghossian, 2006; Null, 2004; Phillips, 1998). In this first part, I'll turn my attention to epistemological constructivism, and in the following section, I'll examine pedagogical constructivism.

As an epistemology, constructivism rejects the traditional or classical view of knowledge as 'Justified True Belief'. This view of knowledge, which can be traced back to Plato's Theaetetus, states that one can only claim to know something if it is true, if one believes it to be true, and if one has justification for the belief. The presuppositions here are both that there is a truth to be known, and that reality exists independent of the knower. In this classical view, when one makes a knowledge claim one is in fact making a claim about how the world is independent of the knower. Epistemologists operating in the classical paradigm are often concerned with what constitutes justification, and whether or not one has sufficient justification to warrant belief in a particular proposition.

For the epistemological constructivist, however, knowledge and beliefs are not about some external reality (von Glasersfeld, 1981, p. 3) but about one's private experiential 'world' and its episodes.[i] Knowledge does not exist independent of the meaning that one attributes to one's experiences. Consequently, there are no objective

criteria for what constitutes knowledge, and no talk about whether or not one has justification to warrant belief.[ii] An important consequence of this is that each person's subjective experience is just as valid as anyone else's, and no one's beliefs or knowledge can be privileged (Boghossian, 2006, p. 4).[iii]

This firm reliance on subjective personal experience entails a type of cognitive and epistemic relativism. Constructivists do not, to borrow wording from John Caputo, betray epistemology with metaphysics (Caputo, 1987, p. 1). That is, the way the world is, independent of the knower, does not factor into strict constructivist epistemology. Having the same constructions entails having similar ontological commitments, and constructivists reject this idea. Metaphysics is irrelevant. The world is irrelevant. Hermeneutics is radical hermeneutics and subjectivity is privileged over metaphysics.

Pedagogical Constructivism

There are many flavours of pedagogical constructivism. While these manifest themselves in different ways, they can generally be seen as outgrowths of epistemological constructivism with a fundamental tenet being that learners construct their own knowledge and meaning. The objective of the pedagogical constructivist is thus not to teach students how to understand the 'true' or 'objective' nature of reality, or to make accurate knowledge claims about the world, or to develop and refine a learner's ability to make and articulate increasingly reliable justifications. The role of the constructivist educator is to aid and to facilitate students in their construction of knowledge.

Because constructing meaning *is* learning, constructivist learning objectives are centred on making meaning out of sensations and experiences. von Glasersfeld, for example, in stating that 'knowledge' is 'actively constructed' by the learner, writes that these active constructions allow one to organize one's experiential world, but not to discover reality independent of the learner (von Glasersfeld, 1984). In this model, what is essential is that students create knowledge and meaning from their experiences. This is how and where learning occurs, and it can be accomplished independently from matters of fact about the world.

Critical Thinking

In 1990 the American Philosophical Association (APA) published the most extensive and comprehensive study of critical thinking in history. The purpose of the study was to define critical thinking. To reach their objective, the APA chose a panel of experts consisting of 'forty-six men and women … in the United States and Canada. They represented many different scholarly disciplines in the humanities, sciences, social sciences, and education' (Facione, 1996, p. 7). Every one of the 46 scholars were 'widely recognized by their professional colleagues to have special experience and expertise in CT [critical thinking] instruction, assessment or theory' (APA, 1990, p. 4). Once the panel was assembled, they used a Delphi Technique to answer their research question. A Delphi Technique is a fairly straightforward methodology. Facione (1996) details the Delphi Technique used in the APA study:

> A central investigator organizes the group and feeds them an initial question. The central investigator receives all responses, summarizes them, and transmits them back to all the panelists for reactions, replies,

> and additional questions … the central investigator summarizes the arguments and lets the panelists decide if they accept them or not. When consensus appears to be at hand, the central investigator proposes this and asks if people agree. If not, then points of disagreement among the experts are registered. (APA, 1990, p. 8)

At the conclusion of the study, the panel reached a consensus about the definition of critical thinking and its core elements. (The APA's report does not suggest how critical thinking ought to be taught). The following is the abbreviated consensus statement regarding critical thinking (the complete definition can be found in Appendix A):

> We understand critical thinking to be purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgment is based (APA, 1990, p. 3).

To briefly clarify this definition, critical thinking is a judgment that has a purpose and is self-regulating and self-correcting. This judgment then results in an interpretation, an analysis, an evaluation and an inference based upon evidence, concepts, methods, criteria, and contexts.

The APA's (1990) *Delphi Report* also detailed 'central' or 'core' critical thinking skills. Each of these individual elements relates to a particular part of the consensus statement of critical thinking given in the *Delphi Report*. The panel's consensus is that critical thinking has six core elements: Interpretation, analysis, evaluation, inference, explanation, and self-regulation. Element #6, self-regulation, bears directly on our examination.

The APA describes self-regulation as '…applying skills in analysis and evaluation to one's own inferential judgments with a view toward questioning, confirming, validating, or correcting either one's reasoning or one's results' (APA, 1990, p. 10).

Self-regulation consists of two parts: self-examination and self-correction. Self-examination is basically one's ability to reflect on issues and to reflect on one's reflections. Self-correction is one's ability to 'remedy or correct…mistakes and their causes' (APA, p. 11). Thus the ability to correct one's judgments, propositions, methods of analysis, reasoning processes, etc., is a vital element in the critical thinking process.

Corrective Mechanisms

Referents and Metaphysics

To think critically there needs to be some corrective mechanism—some way to enable a learner to correct or to modify her thoughts, cognitions and propositions. Aptly, the APA terms these mechanisms 'self-regulation' and 'self-correction' (APA, 1990, p. 6 & 11).

The method of instruction can create an opportunity for learners to *critically* engage content. Critically engaging content means facilitating the core elements of critical thinking, like adjudicating propositions (evaluating and analyzing), analyzing complex relationships (analysis), spotting invalid inferences (inference), interpreting data (interpretation), correcting faulty propositions (self-correction), articulating the results of one's inquiry (explanation), etc.[iv] If there is no possibility for self-correction, or no way for a learner to be shown that her reasoning is fallacious or that *her constructions are in error*, then by the APA's definition of critical thinking, there is no *critical* thinking occurring.[v]

The reason the 'critical' element is absent if there is no corrective mechanism is because critical thinking cannot arise when subjectivity, or an individual learner's

personal experiences, are privileged over an objectively knowable world and public rules of language usage. This argument is similar to Wittgenstein's reasoning for why there can be no private language,[vi] that is, a language invented by and only known to the speaker (Wittgenstein, 1973). Among other reasons, one would not know if the referents of words, or the grammar, were constant, and thus one would not know if one was using a word correctly. To use a word correctly means, by definition, that there is a correct and an incorrect usage. The only way to know if a word was used correctly is if there is some way to adjudicate its usage, like looking the word up in a dictionary, or asking other native speakers. Language is necessarily public.

Similarly, more radical versions of constructivism do not and cannot provide the vehicle or the delivery mechanism by which one can subject one's cognitions, and by extension one's propositions, to modification. If I use a word incorrectly then my linguistic community can correct my speech. Steve Martin has a famous joke about teaching his child different referents for words. On the first day of school when his son wants to go to the bathroom he asks the teacher, 'Mambo dog fish to the banana patch?'. If each student constructs his own knowledge, then there is no way for an educator, or for another student, to challenge one's knowledge claims, or in this case, to know the referents for one's words. In the case of Steve Martin's unfortunate hypothetical son, there are agreed upon referents for what he wishes to describe. There are ways to correct his words and his grammar (through ostension, for example) that bring his utterances in line with commonly accepted rules of grammar. These corrections are possible because of a shared, knowable world — because of an

objective, independent metaphysic. Without a corrective mechanism, and without a stable, shared metaphysic, critical thinking is impossible.[vii]

Responses

In response, the constructivist might argue that while it would be nice to have epistemic access to dictionaries, other language speakers and so forth, that just is not possible, and so concerns about the consistency of meaning are regrettable but that's just the way things are. The problem with this is pragmatic: Steve Martin's hypothetical son never gets permission to go to the bathroom. In a similarly pragmatic vein, we know that linguistic communicative interaction is not just possible, but that it occurs constantly.

Radical constructivists may respond to the need for self-regulation and self-correction by bringing up the demand for viability as a feature of a belief system. von Glasersfeld writes that viability is 'Getting us what we want' (von Glasersfeld, 1981, p. 4). Viability can be seen as an agent's successful navigation of her experiential life. One does not need to assume external reality in order to successfully navigate one's inner life. This is highly problematic, however, for a number of reasons.

First, if one is delusional, or under the influence of potent hallucinogens, then one could believe that one is getting what one wants when in fact one is actually being tortured, for example. The problem for the constructivist, therefore, would be that she is self-regulating or self-correcting by reference to the wrong standards of justification. By reference to purely internal standards of justification one cannot distinguish fantasy from

reality. However, if one does not believe in external reality, then this would not be problematic.

Second, and more damaging to the constructivist argument, is that the demand for viability is what thinkers in the rationalist tradition (Apel, 1984; Habermas, 2001) refer to as a performative contradiction. That is, the act of arguing contradicts the propositional content of the argument, i.e., what is argued. This happens in two ways, directly and indirectly. First directly, the performance of the speech act contradicts the content of the speech. When the constructivist uses language to articulate notions of constructivism and validity, the constructivist is taking what Habermas calls a 'communicative stance'. She is engaged in the process of communication, but with whom? With herself? (Is constructivism now reduced to solipsism in order to avoid basic contradictions?) If there are no communicative entities then what is the purpose of the utterance? At best this is contradictory, at worst is it dishonest. (It would be dishonest if one actually believed that there were others with whom one was communicating). Second indirectly, how should one take various versions of the claim 'No entities exist outside of myself'? Whether the claim is taken either subjectively or objectively, it cannot be believed by anyone who hears it — as I am an entity outside of the utterer of the claim.[viii]

Less radical constructivists might argue, to borrow terms from the philosophical lexicon, that coherence theories of justification lead to coherence theories of truth. That is, the truth of any proposition consists in its coherence to a given set of propositions, and this in turn entails a correspondence to objective reality. These arguments have a fairly extensive pedigree, dating back to Blanshard's seminal 1939 work 'The Nature of

Thought' (Blanshard, 1939). This is highly problematic because, on this model, there would be no way to know that beliefs that cohere match up to external phenomena. At best, one could have a coherence theory of truth, or a series of consistent propositions.

Classroom Examples

A corrective mechanism is indispensable to, and inseparable from, *critical* thinking — without a corrective mechanism 'critical' becomes divorced from 'thinking'.[ix] A few examples may help to clarify this. I recently evaluated a professor who taught an introductory math class. The professor, a newly minted Ph.D., had students 'journal' their feelings about math. The class would then come together and discuss their journal entries. In her math class, students did not do any actual math, rather they discussed their math fears along with possible math applications. At the end of the class the professor said to me, 'I'm so proud of them [the students]. They really did a great job. There was a lot of critical thinking in there'. I asked what she meant, and she responded, 'Critical thinking about math is not easy, but it can be done through Discovery Learning.[x] They managed to confront their fears on their own. Now it will be easy to overcome those fears.' (While this may seem bizarre and extraordinary, a quick google search on 'journaling your feelings about math' will reveal thousands of distinct sites detailing the same classroom practice). It is easy to dismiss such a practice as extreme, or out of the norm, but in the hundreds of instructors and classes that I've professionally evaluated, some variation of a subjectively dependent practice is, in my experience, more the norm than the extreme.

Granting primacy to one's subjective experiences and labelling that 'critical thinking' is not unique in mathematics education (also called 'new new math'). I've evaluated classes in psychology and human services where the professor modelled group therapy by attempting to create a 'therapeutic environment' in the classroom. In one class, students sat in a circle and talked about a wide range of issues. Students,

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[i] Von Glasersfeld writes, 'we must never say that our knowledge is 'true' in the sense that it reflects an ontologically real world' (von Glasersfeld, 1981, p. 6).

[ii] Raskin states, 'People cannot know for certain if their constructions correspond to an independent reality, but they can know if their constructions work well for them. In this regard, people are cognitively closed systems...' (Raskin, 2002, p. 2).

[iii] There is no single constructivist analysis of knowledge. There are, however, overlapping epistemological commitments among the different strains of constructivism. Constructivists assert that there are no objective criteria for what constitute knowledge (Poerksen, 2004), and they view knowledge as that which 'refers to the contents of an individual mind' and to the 'tacit mental structures that allow one to interpret the world' (Selden, 1998). On this view, inter-subjectivity and viability replace objectivity and truth.

[iv] For example, if a student makes inferences (inference), whether invalid or not, then the teacher needs to question those inferences and/or offer alternative inferences. To facilitate critical thinking the student should then reevaluate her initial inferences (self-regulation) and change her mind, or not, based upon the reevaluation. The student would then explain (explanation) the reasons that she changed her mind, or not.

[v] In the psychological literature, constructivism has been criticized because it does not facilitate 'cognitive activity' or 'cognitive processing' (Mayer, 2004). Examples of cognitive activity are selecting, organizing, and integrating knowledge (Mayer, 2004, p. 17). The Delphi Report fills in the gaps by detailing and explaining the elements, categories and sub-skills of critical thought. For more on critical thinking and cognitive science, see Van Gelder's seminal article, 'Teaching Critical Thinking: Some Lessons from Cognitive Science' (Van Gelder, 2005).

[vi] For more here see Wittgenstein's Philosophical Investigations, section 244-271, and Kripke, 1982.

[vii] At best, one could have a coherence theory of truth, or a series of consistent propositions. The elements of critical thinking as defined by the APA, however, would still be absent.

[viii] Such radical scepticism about the external world sits oddly as a theory underpinning any pedagogy - just what is to be a constructivist teacher's construal of those taught?

[ix] In 'Fear of Knowledge,' Boghossian terms this epistemological view 'Equal Validity,' because it denies 'fact-objectivity,' that is, the idea that with respect to factual questions, 'there is a way things are that is independent of us and our beliefs about it' (Boghossian, 2007, p. 3).

[x] For more on 'Discovery Learning,' see Mayer's 2004 piece entitled, 'Should There Be a Three-Strikes Rule Against Pure Discovery Learning? (Meyers, 2004).

however, were not required to comment directly on something someone else said. In the particular teaching demonstration that I witnessed, students said things that were seemingly independent of each other. I am not arguing that this classroom practice is a bad thing — it is certainly possible that this exercise can be a very useful and a very meaningful experience for students who wish to become practicing psychologists. What I am arguing is that there is no critical thinking occurring in these environments.

In this last example, it is possible for a measure of critical thinking to occur if at the end of the activity there is some type of meaningful synthesis that uses a corrective mechanism, forcing students to draw upon the APA's core elements of critical thinking. The professor could, for example, set aside a significant period of time after the activity and do the following: Provide students with a framework for analyzing the discussion (analysis) and have students articulate how their experience relates to the learning objectives for the class (explanation); Ask students what unstated conclusions they could reliably draw from what their fellow classmates were saying, or were not saying (inference), and then challenge those conclusions either by counterexamples or by asking students to provide evidence—and then challenging that evidence—for their inferences (analysis, explanation, self-regulation); Discuss the effectiveness of this classroom technique as it relates to other techniques that were used in other weeks or in similar classrooms (evaluation).

In the first example (providing a framework and having students relate the discussion to the learning objectives), as long as the teacher provides critical feedback that allows the student to correct, tweak, conceptually reposition, or even intelligently refute the teacher's correction, then this is the data by which a student can modify her

propositions through analysis and explanation. The framework in which this data, and the response to it, occur are the pedagogy. The pedagogy is the groundwork that allows for the possibility of critical thinking. If no corrective feedback is provided, or if any one answer is as good as the next, or even if the teacher does not ask some variation of 'Now why would that be?', and then goes on to challenge the response, then there would be no evidence of *critical* thinking.

Importance

The incompatibility between constructivism and critical thinking is important because many educators who wish to uphold science, rationality and Enlightenment ideals use a pedagogy that undermines the very values that they are attempting to promulgate.

Scholars have written about the importance of critical thinking, what it is and why it matters (Boghossian, 2001; Facione, 2007), and the consequences of both philosophical and epistemological constructivism (Boghossian, 2007). Boghossian argues that the latter is not merely an academic matter, but that 'If the vast numbers of scholars in the humanities and social sciences who subscribe to it are right, we are not merely making a philosophical mistake of interest to a small number of specialists in the theory of knowledge; we have fundamentally misconceived the principles by which society ought to be organized' (Boghossian, 2007, p. 5). Rather than add my voice to the chorus of academicians who have reconstructed reason (notably McCarthy, 1995; Schrag, 1991), and the individuals and institutions who have argued passionately for re-institutionalizing rationality and science in our educational system (notably Richard Dawkins, the Skeptic Society, The James Randi Educational Foundation, and the

National Science Foundation), I have argued that constructivism is not and cannot be the pedagogical vehicle that will take us towards the critical thinking ideal that the APA Delphi Report details.

Epistemological relativism, which rests at the heart of some of the more extreme versions of constructivism, is a toxin to cultivating critical thinking as a practical ideal. And critical thinking is not just important, but indispensable, due to its emancipatory potential. We can use reason to make better decisions, to form better communities, and to lead better lives. Quoting from the *Expert Consensus Statement Regarding Critical Thinking and the Ideal Critical Thinker*, 'CT is a liberating force in education and a powerful resource in one's personal and civic life…educating good critical thinkers… combines developing CT skills with nurturing those dispositions which consistently yield useful insights and which are the basis of a rational and democratic society.'

APPENDIX A

CONSENSUS STATEMENT REGARDING CRITICAL THINKING

AND THE IDEAL CRITICAL THINKER

‘We understand critical thinking to be purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgment is based. CT is essential as a tool of inquiry. As such, CT is a liberating force in education and a powerful resource in one’s personal and civic life. While not synonymous with good thinking, CT is a pervasive and self-rectifying human phenomenon. The ideal critical thinker is habitually inquisitive, well-informed, trustful of reason, open-minded, flexible, fair-minded in evaluation, honest in facing personal biases, prudent in making judgments, willing to reconsider, clear about issues, orderly in complex matters, diligent in seeking relevant information, reasonable in the selection of criteria, focused in inquiry, and persistent in seeking results which are as precise as the subject and the circumstances of inquiry permit. Thus, educating good critical thinkers means working toward this ideal. It combines developing CT skills with nurturing those dispositions which consistently yield useful insights and which are the basis of a rational and democratic society.’

From the American Philosophical Association Delphi Report
(APA, 1990, p. 4)

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