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Thinking Critically about Critical Thinking in Higher Education

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Abstract

The literature on critical thinking in higher education is constructed around the fundamental assumption that, while regarded as essential, is neither clearly nor commonly understood. There is elsewhere evidence that academics and students have differing perceptions of what happens in university classrooms, particularly in regard to higher order thinking. This paper reports on a small-scale investigation in a Faculty of Education at an Australian University into academic and student definitions and understandings of critical thinking. Our particular interest lay in the consistencies and disconnections assumed to exist between academic staff and students. The presumption might therefore be that staff and students perceive critical thinking in different ways and that this may limit its achievement as a critical graduate attribute. The key finding from this study, contrary to extant findings, is that academics and students did share substantively similar definitions and understandings of critical thinking.

Keywords: critical thinking; preservice teacher education

Introduction

There have been allusions to "critical thinking" in the literature since Francis Bacon (attributed) offered in 1605 that it was the "desire to seek, patience to doubt, fondness to meditate, slowness to assert, readiness to consider, carefulness to dispose and set in order; and hatred for every kind of imposture." Its definition, since the seminal work of Glaser (1941), has related to its being an individual cognitive skill with three distinct characteristics:

1. An attitude of being or state of mind to thoughtfully consider the problems and subjects that come within a range of one's experiences;
2. Knowledge of the methods of logical enquiry and reasoning; and,
3. Some skill in applying those methods.

Critical thinking has gained heightened attention in higher education in Australia since the Graduate Skills Assessment (GSA) (Nelson, 2003) listed it as one of the four areas to be assessed. It has subsequently emerged as a key element in the published Graduate Capabilities of all Australian universities (Tapper, 2004).

Critical thinking is also an important goal of education within the schooling sector. It is embedded in the Melbourne Declaration (*Educational Goals for Young Australians*) (MCEETYA, 2008) which describes successful learners as those who are "able to think deeply and logically, and obtain and evaluate evidence in a disciplined way as the result of studying fundamental disciplines" (p. 8); and, elsewhere, as those who "are able to make sense of their world and think about how things have become the way they are" (p. 8). This would indicate that, for the pre-service teachers who participated in this study, it is important to be engaged in critical thinking (i) for their own academic development and to demonstrate this capacity as a part of achieving the requisite Graduate Attributes; and, (ii) to understand its role in their future professional practice as teachers.

From our scan of the literature, we have determined that the research on critical thinking in higher education falls into two broad categories. The first is related to a perceived need for a consistent and precise definition (see, for example, Black, 2008; Tsui, 2002) evident in the view that critical thinking "is another concept whose value is diminished by terminological disarray" (Gabannesch, 2006, para. 1). Similarly, Barnett (cited in Tapper, 2004) noted that "critical thinking is a defining concept of the Western university. Almost everyone is in favor of critical thinking, but we have no proper account of it" (p. 201). The need for a definition is deemed to be of importance because "critical thinking" is used so frequently and so broadly as to have lost the precision needed to apply it to measurable or demonstrable outcomes. Knight (2007), for example, argued that clear and shared understanding was essential for a fair and valid assessment of students' critical thinking. Allied to this category is the body of research where students' perceptions of critical thinking are considered (see, for example, Scott, 2007; Shah, 2008; Tran, n.d). This category typically includes investigations into the relationship between students' dispositions, perceptions and learning outcomes (See, for example, Sulaiman, Rahman, & Dzulkifli, 2007; Trigwell, Prosser, & Waterhouse, 1999).

The second category relates to pedagogical approaches, which, in turn, are described as either (i) standalone programs, or (ii) contextualised into existing studies or activities. Where critical thinking is taught as a standalone course, it is typically within more general academic skills programs (see, for example, Tapper, 2004; van Gelder, 2000). In the research related to this instance, investigations are typically undertaken to measure the efficacy of these courses or their transfer of learning to contextualised studies. These courses have been developed because of presumed low levels of critical thinking amongst tertiary students (Guest, 2000; van Gelder, 2005). The standalone option is challenged by criticism of critical thinking as a "free-floating entity" (Moore, 2004); a contention which has implications for the potential to either teach or test it out of context.

Where academics have purposefully integrated critical thinking into student activities, particularly assessment items, has also been investigated (see, for example, Barry & Kanematsu (2008) who researched critical thinking in Science and Engineering; and Savich (2008) who considered critical thinking in History). This category also includes investigations into specific teaching and learning activities (see, for example, Dawidowicz (2008) who studied the promotion of critical thinking in group work).

The small scale study described in this paper directly and indirectly rests across the identified categories by:

- a. Considering the working definitions of academics and students and map these against published definitions and the University's broad descriptor of critical

- thinking as the ability to critique current paradigms and contribute to intellectual inquiry: and,
- b. Identifying where and how academics have contextualised critical thinking in the discipline of Education in a Faculty where no standalone programs in critical thinking are offered.

Our interest in seeking perceptions from both academics and students was heightened by the disparity on measures of active learning, interaction and work-integrated learning between these cohorts in the large scale AUSSE (Australasian Survey of Student Engagement) and complementary SSES (Staff Student Engagement Survey) (see ACER, 2010). Similarly, the 2005 NSSE (National Survey of Student Engagement) and FSSE (Faculty Survey of Student Engagement) from the University of Western Australia (UWA) revealed that there were marked differences between academics and staff in regard to: (i) developing higher order learning strategies; (ii) challenging students; and, (iii) cognitive load of set assignments. Of particular interest, was the finding that while 92% of academics believed it was important to "be able to learn something that changed their perspective, many students (54%) felt that they had not been given the opportunity to do so" (UWA, 2007, para. 14)

Method

The study from which this paper is drawn addresses a gap in the literature through its attention to the field of Education and to the application beyond the University of the skill of critical thinking. The study did not attempt to measure students' capacity in critical thinking using standardised tests but, rather, considered students' understanding in contextualised teaching and learning experiences. It similarly sought details of practice from academics to provide a context for the students' responses and reactions and asked for academics' perceptions of students' capacity to determine potential consistencies and disconnections between academics and students.

Existing studies in critical thinking are predominantly drawn from either standardised tests such as the Watson-Glaser Critical Thinking Appraisal (El Hassan & Madhum, 2007) or from surveys (e.g. van Gelder, 2000, 2005). As noted, the small-scale study described in this paper is concerned with how understandings between students and academics "match" and to look for instances in students' learning experiences. The perceived efficacy of students' critical thinking and recounting of experience was investigated by adopting self-authored survey instruments and a qualitative methodology.

Participants

The participants for the study were students ($n=26$) and academics ($n=21$) in a Faculty of Education in a large Australian University who self-selected to complete a targeted online survey. Participation was voluntary and anonymous.

The students were undergraduate pre-service teachers enrolled in a four-year Education degree program. There was participation from all four year levels of the degree program and responses came, albeit unevenly, from students in all three of the University's undergraduate degrees: Secondary, Primary, and Early Childhood. A breakdown of participants by course and year level is provided in the following table.

Table 1. Student survey participants

Course	First year	Second year	Third year	Fourth year	Total
	<i>n</i>	<i>N</i>	<i>n</i>	<i>n</i>	<i>N=26</i>
Bachelor of Education (Secondary)	3	2	2	4	11
Bachelor of Education (Primary)	1	3	2	4	10
Bachelor of Education (Early Years)	1	-	1	1	3
Not known	1	-	-	1	2
TOTAL	6	5	5	10	

As can be discerned from Table 1, the students who responded to the survey were predominantly from the first ($n=6$, 21.3%) and fourth (final) ($n=10$, 38.5%) years. As noted, responses came from students in all three of the University's undergraduate degrees: Secondary ($n=11$, 45.8%); Primary ($n=10$, 41.7%); and Early Years ($n=3$, 12.5%). The students cited in this paper are accorded a number in order of their citation.

No demographic details were sought from the academics in the study. Typically at the University where the study was conducted, academics have content specialisations, for example, Mathematics Education, Social Sciences Education; but work "across" the degree courses and year levels. All have generalist backgrounds in educational theory and/or cognitive science and many have experience as classroom teachers.

Instruments

Two anonymous online surveys were developed and made available for four weeks towards the end of the second semester 2009. Ethical clearance was attained through the University Human Research Ethics Committee in accordance with the National Statement on Ethical Conduct in Human Research (National Health and Medical Research Council, 2007). Both surveys were advertised through emails with reminders sent part way through the survey period. These surveys will be referred to simply as: (a) the student survey, and (b) the academic survey.

Student Survey. The student survey comprised six items. The first two asked students to select their enrolled program and year level. The following key questions asked for extended responses:

1. Define critical thinking in your own words.
2. Please provide details of an assessment item or learning experience you have undertaken during your course which has required critical thinking. Please explain why you have chosen this example.
3. How have you/might you encourage critical thinking in your own teaching practice? Please describe a learning experience you have designed or observed.
4. Do you think your ability to think critically has improved since you began your education degree? (yes, no, unsure) Please explain.

Responses could be typed directly into the survey with a limit of 200 characters for each question. All but the question relating to the pre-service teachers' own practice (i.e., Question 3) have informed the findings presented in this paper.

Academic Survey. The academic survey also comprised six items:

1. Please define critical thinking in your own words.
2. Have you devised or set activities or assessment items that demonstrate students' capacity for critical thinking? (yes, no, unsure). Please provide brief details of these activities or assessment items.
3. Do you explicitly "teach" critical thinking to students for their own learning or for inclusion in learning tasks (lesson or unit plans) that they design? (yes, no, to some extent). Please provide details.
4. How would you rate your undergraduate students' ability in critical thinking? (7 point Likert scale radio buttons ranging from "inferior" through mid point "neutral" to "superior")
5. Have you observed heightening levels of critical thinking between first and fourth year students? (yes, no, unsure). Comments.
6. Are there any other comments you'd like to make on critical thinking?

The question common in both the student and academic survey, namely, "What is critical thinking?" allowed direct comparison of understanding between (and within) the two cohorts and against published definitions. It was the first question posed in both the student and the academic survey.

Key comparative aspects of the surveys were that academics were asked to rate their students' ability in critical thinking and to comment on observed differences in ability from first to final year of study. This contrasted with the student survey where participants were asked if they felt their ability in critical thinking had developed over time, that is, from the beginning of the course to their present stage. Additionally, in asking the academics if they had set assessment tasks or activities that required critical thinking and the students if they had been asked to complete such activities we were able to compare and contrast differences in perceptions of critical thinking between academics and students.

Data analysis

Data was analysed using thematic coding to identify emerging themes or categories. Axial coding (Creswell, 2005) was used as a second level coding procedure to make connections between the categories. The authors shared and compared their coding to assure a level of inter-rater reliability. Simple descriptive statistics were also applied.

Findings

The findings are here presented in three sections (i) defining critical thinking; (ii) mapping students' understanding and use of critical thinking; and, (iii) contextualising critical thinking. There is an inter-relatedness to the questions in that an individual's definition of critical thinking influences their actions while their actions iteratively affect their understandings and self-efficacy in applying critical thinking to their own teaching and learning. Was noted, we were particularly interested in identifying student: faculty matches (consistencies) and mismatches (disconnections) in understanding or perception. All findings are presented with the caveat that they are drawn from a small self-selected sample within a Faculty of Education which limits the generalisability of the findings to other disciplines or to larger populations of students and/or academics. Where direct quotation is made from

the surveys, attribution is accorded anonymously in order of appearance in the text, for example, Academic 1, Student 1.

Defining Critical Thinking

In the first question of their respective surveys, both academics and students were asked directly to define “critical thinking” in their own words. The intention was to map these definitions against published definitions and to compare and contrast responses from the two groups. Extant definitions were scanned and a simple schema of common characteristics was devised. These characteristics were: (i) state of mind or disposition; (ii) techniques or processes; and, (iii) ability to critique or the application of critical thinking to learning. Responses from students and academics were coded with the unit of measure being the definition as a whole and with only one characteristic accorded to each definition. This process – as reported in Table 2 – identified a difference in emphasis within the given definitions.

Table 2. Comparisons of characteristics of academic and student definitions of critical thinking

	Characteristic 1	Characteristic 2	Characteristic 3
	State of mind	Techniques and processes	Ability to critique
Students	27.78%	22.22%	50.00%
Academics	36.84%	47.37%	15.79%

Academics were more likely to see critical thinking as a state of mind or to deconstruct it into techniques and processes than students. While frequently “theoretical” in their inclusion of direct citation to the literature and terms drawn from cognitive science, all academics wrote in their own words and, in some instances, devised personal analogies, for example, “a constellation of cognitive skills” (Academic 1). The notion of critical thinking as a state of mind - noted in 36.84% of academics’ responses - was evidenced through such comments as:

- ... willingness to consider interpretations of data or experience that may conflict with one's own preferred world view (Academic 2); and,
- ... an orientation to learning (Academic 3).

The majority (47.37%) of academic definitions expressed critical thinking in terms of its techniques and processes and a number made specific reference to their own teaching practice and that of their students as pre-service teachers. Examples of this can be seen in the following:

- Critical thinking has two meanings: 1) higher order thinking 2) social critique Students often mix these up so I spend a lot of time disentangling them. The difference matters in my area given that we teach comprehension and critical literacy (Academic 4); and,
- From a lecturing point of view: Critical thinking is about examining assumptions, about not taking anything for granted and about understanding concepts clearly so that students can think clearly about what they are consuming politically and culturally. It is about helping students to develop their own well-informed opinions about the world. In the teacher trainee context, it is also about helping students develop a clear idea of what they will be doing in classrooms and why,

and then teaching their own students to engage in “critical thinking” about how the world and society works (Academic 5).

The academics’ definitions were typically longer and more theoretical than those offered by students. They frequently evidenced more than one characteristic, for example, Academic 6 offered that:

My approach takes students through a critical reflection and learning process to challenge their current thinking about a range of issues in society. Students need firstly to become aware of issues such as society’s injustices to marginalised groups in society, understand that our education system can perpetuate those injustices and then come to an understanding that they can challenge the system and become change agents in our education system. Critical thinking leads to transformational learning. I draw on critical social theory as a framework for this approach.

Here, Academic 6 has alluded to a *state of mind* through reference to “change agents” and “transformational learning” and has made a detailed listing of *techniques and processes*, for example, “critical reflection and learning process,” “become aware of issues,” and “critical social theory.” This statement was coded under “techniques and processes” because of the precision and level of detail offered. The particular combination of categories in this response as well as their prevalence in the data presented in Table 2 led us to a new categorisation of “process” in terms of the academic focus. In this, we concluded that, consonant with notions of deep learning (see, for example, Entwistle, 1994, 1995; Entwistle & Ramsden, 1983), academics were looking for long-term and transferable skills for their students.

Interestingly, there was little difference in the intent and content of the definitions offered by academics and students. The difference (as noted in Table 2) lay in how critical thinking was made manifest in individual practice. As noted, academics appeared concerned with *process* while students can be said to be more concerned with *product*, or shorter-term outcomes or skill sets to be demonstrated. “Product,” more consonant with notions of surface learning (cf: deep learning) was seen as complementary but substantively different to the academics’ “process.” This may well be associated with student’s predominant and pragmatic focus on assessment and grades.

Student responses – evidencing their emphasis on critical thinking as an outcome or product – included:

- Possessing the ability to think about a topic just discussed and analyse it and think about how it may affect you, ... its benefits, how can I use this item, product etc. (Student 1, 1st Year, B.Ed (Primary)).
- Looking at all possibilities and analysing the situation. (Student 2, 1st Year, B.Ed (Early Years)).
- Looking beyond literal information available. Making inferences, drawing conclusions, predicting, reflecting (Student 3, 2nd Year, B.Ed (Primary)).
- Being able to think independently and critique what you hear (Student 4, 3rd Year, B.Ed (Early Years)).
- Analysis of texts, concepts and beliefs that goes beyond understanding and retention of facts to a higher level of investigation using reasoning and cross disciplinary knowledge to assess the validity, viewpoint and biases of the particular text, concept or belief. (Student 5, 1st Year, B. Ed (Secondary)).

Student 6 (4th Year, B.Ed (Secondary)), somewhat ironically, took the opportunity in his/her definition to complain of a perceived over-emphasis on critical thinking:

Critical thinking is being able to recognise that some texts have been constructed to position the reader in a particular way for a reason other than to inform or entertain. I do believe though that many teachers take this too far in their teaching by asking their students to see what is in fact not there in the first place. This is especially the case when asking students to analyse a text with a viewpoint that has had no initial impact on the production of the text.

Here Student 6 has become critical of critical thinking as it is taught. He/she has arrived, perhaps inadvertently, at the historian's conundrum of viewing the past through the eyes of the present (Star, 1995). Being aware of contemporary attitudes and moirés is an arguably sophisticated thinking skill in countering bias and personal subjectivity in the analysis of texts or actions from previous times or cultures other than one's own.

A matching of both academic and student definitions to the University's description of critical thinking as the ability to critique current paradigms was noted. In several instances, this was an explicit match, for example:

- [Academic 7] Ability to reflect deeply on power relationships, whose interests are served through particular pedagogic decisions, and whose voices are heard/silenced
- [Student 7, 1st Year, B.Ed (unspecified)] Thinking about problems and issues in a way that doesn't necessarily conform to the main discourse but confronts and challenges it as well.

Overall, the difference in definition by students and academics appeared to be one of perspective and purpose rather than any fundamental difference in conceptual understanding of critical thinking. All proffered definitions, however informally worded, were synonymous with extant definitions. Interestingly, despite the small sample, there appeared to be little difference in the intent of definitions offered by students across their course of study, that is, between first and fourth year. This may be noted in the selected citations, namely, Students 1, 2 and 5 are in their first year while Student 6 is in the fourth and final year of study. Differences between the courses, that is, Secondary (e.g., Students 5 and 6), Primary (e.g., Students 1 and 3) and Early Years (e.g., Students 2 and 4) were similarly minimal but difficult to determine with any certainty because of the marked disparity in representation.

Understanding and Use of Critical Thinking

The fourth question in the academic survey asked for a rating (on a 7 point scale, with 0 as the lowest and 7 as the highest) of undergraduate students' ability in critical thinking. The offered ratings of student capacity were particularly cautious with the predominant rating being "neutral" ($n=4$, 22.2%) with 61.1% offering a midpoint rating (3, 4, 5). While no academic rated their students' ability as "0" (inferior) and only one, Academic 2, offered a rating of "7" (superior), a tally of the "deficit" ratings (0, 1, 2, 3) ($n=7$, 38.9%) equalled the tally of "positive" ratings (5, 6, 7) ($n=7$, 38.9%).

When asked (through Question 5) if they had observed heightened levels of critical thinking between first and final year students, that is, a development over the four years of the

course, the predominant response from the academics was “unsure” ($n=7$, 38.9%). This, however, was not drawn from the same caution accompanying the rating of student capacity. It can, rather, and, as noted in the comments accompanying the multiple-choice responses, be attributed to a genuine lack of familiarity of students across a range of year levels. Despite this, however, eight (44.4%) noted an improvement with one believing that this development occurred “because they [students] have had more experiences in their own learning and, after being on teaching prac [field studies], have a deeper understanding of what it means.” From this could be inferred that a direct and metacognitive link between being both teacher and learner places students in Education faculties in a rare (and arguably privileged) position to consciously develop their skills in critical thinking.

Academic 4, one of three (16.7%) who had said “No” offered that “there are always some 3rd and 4th year students who manage to demonstrate higher order critical thinking. However, there are many who ... describe and repeat rather than apply. Even at Masters level.” Another, Academic 3, commented that “some students enter the University willing to ‘think outside the square’ while others maintain their conservative approach to life regardless of our teaching. The faculty as a whole promotes compliance and conservative thinking as a way to achieve higher grades.” This individual explicitly taught critical thinking and created assessment items which “encourage[d] students to challenge their ‘first’ or common interpretations and to seek alternatives that are possible.” As a concluding remark, Academic 3 offered that “the term [critical thinking] is perhaps too broad to be useful in any research sense. ... Indeed, it is almost required for even the most conservative and ‘unthinking’ of academics to claim to promote critical thinking!” The breadth alluded to is at the heart of previously cited concerns about a lack of, and subsequent need for, clear and shared understandings of critical thinking as a precursor to its authentic and effective promotion in teaching and learning.

There was little or no match between academics’ ratings of student capacity and the perception of improvement over time, for example, the academic who had rated his/her students’ capacity in critical thinking as “superior” was unsure of their improvement over time because of a lack of unfamiliarity with first year students. Shared observations appeared to be based on personal experience rather than an arguably stereotypical or global perception of contemporary students.

Reviewing the suite of comments accompanying the “over time” rating indicated a similar focus on individual capacity or motivation. For example, Academic 9 offered that “I can't bundle all students into one category - some are outstanding critical thinkers and others require far more scaffolding.” Another, Academic 10, interestingly afforded a more pragmatic view by commenting that:

I suspect that students use their critical thinking capacities as much or even more in their lives outside university than in relation to their studies, where many adopt a utilitarian approach (enough to get a job) or a surface achievement approach (what do I do to get high grades?). In relation to popular culture, some students are able to engage in a level of critical thinking that they do not use in university study.

Students ($n=26$) answered the question of “improvement over time” quite differently to the academics who had responded to the survey. When asked if their ability to think critically had improved since they began their Education degrees, the majority ($n=20$, 76.9%) agreed while only two (7.7%) disagreed. A small but notable number ($n=5$, 19.2%), predominantly from the fourth and final year of their degree program ($n=3$) –

were unsure of such improvement or change.

The accompanying comments provided by students were of interest. The only first-year student, the previously cited Student 5, who was unsure if his/her skills in critical thinking had improved somewhat immodestly offered that "I was always pretty good." One of the three "unsure" students in fourth year, Student 8, offered that "it's very difficult to judge whether my critical thinking has improved when it may not be realistically used in the classroom all the time" while Student 9, the only "unsure" second-year student, offered that "critical thinking was a main part of the high school curriculum so I feel I have learnt the majority of my critical thinking skills through Grade 10." These students were not questioning whether their critical skills had improved over time but appeared, rather, to be unsure if this was directly attributable to the learning experiences of their degree programs.

Where comments were offered to support positive responses, they referred to being asked to think, write reflections after group assignments and being provided with models to use as a framework for effective critical thinking. A second-year student, the previously cited Student 3, offered that he/she does not "just accept[s] info at face value. I tend to question more and look at different points of view" while Student 4, from third year, offered that "my lens has broadened." Another third-year student, Student 10, offered that, "before starting my course I would have only asked simple questions but now I know that I need to ask deeper and more meaningful questions." One comment, against the trend of describing positive classroom interaction, was offered by Student 11, a first-year student: "Whilst it is repetitive (and kind of annoying) by continually being asked questions, I feel I am now more able to not only answer those questions but ask them as well." The proffered comments mirrored students' stated definitions of critical thinking thus showing no marked difference between perceived and enacted understanding.

Contextualising Critical Thinking

To identify where and how academics have contextualised critical thinking in the discipline of Education, the surveys asked comparable questions of both academics and students. All but one academic offered that they had specifically set tasks for students that would demonstrate critical thinking ($n=20$, 95.24%). The examples given by academics included: reflections (on various experiences and in a range of forms); lesson or unit planning with a specific focus on critical and/or higher order thinking; analyses of pedagogical practice where, in one instance, students also developed the criteria for analysis and, in another, was framed as "teaching dilemmas"; analysis of research including complex case studies; and contextualising research into own experiences.

All academics indicated that they explicitly taught critical thinking to students. The only responses selected were: "yes" ($n=11$, 61.1%) or "to some extent" ($n=7$, 38.9%). This would imply that the capacity to thinking critically is not assumed and is discussed with students as an essential cognitive skill for both their own learning and for their future and concurrent teaching practice. The classroom practices described in the survey responses included: demonstration and modelling; discussion of exemplars; collaborative problem-solving activities; and guided selection of frameworks for analysis.

There appeared to be nothing incidental in academics' approaches to teaching about and through critical thinking. For example, the previously cited Academic 5 offered the following clarification:

We distinguish critical thinking as in higher order thinking from critical thinking as in social critique. We link the former to comprehension, understood in cognitive terms, and the latter to critical literacy as a transformative social process. ... Students evaluate lesson plans for the ways in which they represent key learning theories and methodological approaches in my curriculum area.

Further to this, Academic 8 offered that "we ... model critical thinking when we show students how to backward map and create innovative assessment items." This observation further substantiated the mapping of characteristics from academics' definitions (see Table 2).

Where students ($n=26$) were asked to provide details of an assessment item or learning experience that they had undertaken during their course that had required critical thinking, and to provide a rationale for their selection, the majority asserted that all their assignments had required critical thinking. The entries were articulate and were drawn from across the degree courses. As a general exception to the collated comments, Student 12 (a 4th Year B.Ed (Primary) student) cynically offered that "I don't know. Usually to get a good mark you have to regurgitate what the tutor's said or what was in the textbook" before going on to provide a genuine example, which was: "planning a unit of work is probably the closest thing to critical thinking because we have to think for ourselves about whatever the content matter might be and how best to teach it." While overtly concerned with product, this student has curiously (and simultaneously) displayed both deep and surface learning (see, for example, Entwistle, 1994, 1995; Entwistle & Ramsden, 1983).

Of particular note was the frequent reference made to learning experiences in the "humanities" and "social science" units. Specific reference was also made to the core Indigenous Perspectives unit that all students undertake during their course with Student 13 (a 4th Year B.Ed (Primary) student), describing it as being "both confronting and useful in forcing us to think critically about our attitudes to Indigenous Australians" while another said that they were asked to "rethink what we have believed and passively received as truth in the past" (Student 2). The types of tasks listed, with little duplication, included:

1. analysis of news articles to reveal bias and misunderstanding;
2. critiques of published media such as advertisements and "YouTube" videos to identify purpose and audience;
3. essays with caveats, for example, that "it is impossible to write a good essay without employing critical thinking" (Student 5);
4. a critique of a scenario using a class behaviour management system where students had to question the teacher's values and practice as well as to consider the motivation of the school students in behaving as they had;
5. unit plans which "require you to analyse and evaluate subject matter knowledge to design and create sequential learning experiences and resources which meet specific criteria and then justifying the choice of inclusions" (Student 14, 4th Year, B.Ed (Secondary)) and which made students "think for ourselves about whatever the content matter might be and how best to teach it" (Student 12);
6. research projects where critical thinking was employed in selection of resources and scenarios;
7. posters and interviews which gave students the "opportunity to reflect, research, raise questions and present in an active manner" (Student 15, 1st Year, B.Ed (Secondary));

8. critical reflection diaries, for example, observing diversity in school settings.
9. journal entry and reflections on practicum which “encourage critical thinking about my own and other’s actions, and whether they line up with a certain pedagogical or philosophical belief system” (Student 16, 4th Year, B.Ed (Early Years)); and,
10. presentations, for example, “a presentation in a group format critiquing and engaging with a site visit and relating that back to the subject of creative curriculum” (Student 17, 2nd Year, B.Ed (Secondary)).

Two students also volunteered examples from their field studies practicum:

- During my most recent practicum at a school, I was faced with a challenging context and after each lesson I taught, I was required to reflect on the experience, as well as listen and take on board constructive criticism from my teacher mentor. I was required to think of which aspects were significant enough to reflect upon based on the evidence (verbal) and what I deemed necessary to report in my journal. I had to make a decision on what I could apply and improve on in the following lessons. (Student 18, 3rd Year, B.Ed (Primary)).
- I have used a Course Evaluation Form to gauge students’ perceptions. This assessment helps to provide evidence of whether, and to what extent, students are able to reason analytically. Teachers need to be able to design instruction so that students can perform well on them. Students need to learn critical thinking skills to develop concepts for learning and be able to apply in a variety of forms of thinking such as historical, sociological. (Student 10).

One – Student 19 (4th Year, B.ED (Primary)) - offered an example from a unit concerned with Design and Technology Education. It referred to an open design task where the group he/she was in decided to build a solar powered cooker. The student offered as a rationale that “I chose this example because I have been describing it recently to people outside the course, it was engaging for a diverse group of peer students, and was one of the first critical thinking experiences that came to mind.” The description is more properly of problem-solving rather than the more specific cognitive skill of critical thinking. This was the only instance where an example did not match the stated definition. Interestingly, and in opposition to the offered example, this student had offered a definition which indicates a clear and consistent theoretical understanding. He/she wrote that:

To me, critical thinking is related to both deeper and higher order thinking. It is a process of considering a topic or problem from multiple perspectives. It can involve focussing on achieving a particular outcome/resolution or simply to better understand all aspects of an issue. Critical thinking can increase knowledge of a familiar topic, may challenge established beliefs or prior knowledges and can provoke further questions or areas to explore/research.

The examples given by students, as noted in their definitions, repeatedly pointed to a focus on product or outcomes while the examples given by academics alternately focus on process. The differences between students and academics noted in the stated definitions were generally borne out in the illustrative examples that each group has provided.

Discussion

One of the assumptions embedded in the literature, and previously alluded to in this paper, is that critical thinking, while regarded as essential, is not clearly or commonly understood (Barnett, cited in Tapper, 2004; Black, 2008; Gabbanesch, 2006; Knight, 2007). The academics and students surveyed in this small-scale study all articulated definitions which were consistent with the extant definitions in the literature and which, interestingly, could be aligned with each other. All but one student offered illustrative examples of where critical thinking had been demanded of them. Despite this, one of the academics, Academic 11, in response to the final open statement of the survey, offered that "we expect students to do it, but now you are questioning me on my understanding of it, I wonder if I actually understand it myself. If we as the lecturers don't really know what it is, is it little wonder we don't think students can do it." This lack of understanding, although recurrent in the literature, was not borne out either by this individual's own definition or in those supplied by other respondents to the survey. The positioning of the participants in this study in a Faculty of Education may, as noted previously, indicate a predisposition to both theoretical and enacted understandings of critical thinking not evident in other higher education contexts.

Another assumption, on which stand-alone critical thinking courses are typically based, is that students lack capacity in critical thinking. This assumption, as previously noted, is typically evidenced in the design and conduct of stand-alone "thinking" programs. While academics' perceived ratings of students' capacity tended to be non-committal, the students who responded to the survey were quite sure of their ability. In corroboration of this, they all provided plausible definitions of critical thinking and accurately identified those learning experiences where critical thinking had been expected. There was a clear reflexive understanding of critical thinking in the survey sample which, because of voluntary participation and self-selection, may not be present in a larger student cohort or in other disciplines. Academics generally noted a wide range of capacity in critical thinking irrespective of a students' progress in their course of study.

The third assumption is that critical thinking can be taught and tested as an isolated entity. This belongs to the questionable notion of critical thinking as a "free-floating entity" (Moore, 2004). By the specificity and contextualisation given to critical thinking in the discipline of Education, it would appear that the predominant approach here is that to think critically, one needs to have something to think about. The students in this study – albeit from a small self-selected sample – appear to have frequent and explicit practice in thinking about specific issues, scenarios or problems. The key finding from this small-scale study is that while academics and students share substantively similar definitions and understandings of critical thinking, there are subtle differences of perspective between them. Differences between academic and student definitions lay in perspective and purpose, with students placing greater emphasis on the products of critical thinking while academics focussed on disposition and process.

Conclusion

The small-scale study described in this paper found that students, irrespective of course of year level, were generally confident in their ability to think critically and were able to clearly identify activities in their coursework that demanded critical thinking. In contrast, although reporting on a broader cohort than the students who responded to the survey, academics commented on a range of critical thinking capacity in their students.

Overall, the findings from this study did not bear out expectations arising from the contemporary literature, particularly the suggestion that academics and students would differ with respect to their understandings of critical thinking. This may, however, be peculiar to the discipline context of the study, being a Faculty of Education, and targeting a cohort of pre-service teachers. It is cautiously contended that learning *about* critical thinking may be an essential and complementary strategy to learning *through* critical thinking.

The key findings of the study were that:

1. Students and academics articulated consistent definitions and understandings of the concept of critical thinking, which, in turn, were consistent with extant definitions in the literature.
2. Students appeared more concerned with the outcomes of critical thinking, perhaps a function of their pragmatic focus on assessment, leading us to suggest that students' emphasis was on *product*.
3. Academics appeared to place greater emphasis on disposition and the processes of critical thinking, perhaps a function of their focus on graduate capabilities including lifelong learning. This led us to suggest that academics' emphasis was on *process*.

Teaching and learning in tertiary contexts, and perhaps all contexts, can hopefully draw from the findings of this research to inform curriculum design, teaching approaches, and the architecture of assessment as platforms for learning. First, academics would benefit from targeted reinforcement that orientation toward critical thinking as evidenced in the products of coursework does not undermine the integrity of critical thinking as a developing disposition or process. In fact, coursework designed to promote critical thinking actually achieves this aim and can be evaluated for quality in the products.

This study's finding that students not only understand the concept of critical thinking but also have the capacity to think critically with a sense of rigour at all levels of an undergraduate study program should encourage academics to consider their course design to provoke this even further. Critical thinking, when explicitly discussed and developed in context, can be viewed as a road to higher level connections with epistemologies of disciplines.

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