Disciplinary Enculturation in Critical Thinking: Do we adopt a Strategic Approach?

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Abstract — *As critical thinking is a key of higher education, academics in various disciplines in Western universities strive to cultivate disciplinary based critical thinking by introducing subject specific knowledge and allowing students to apply these skills in a broader physical and social context. Such a task is equally challenging in postgraduate and undergraduate courses. While some research studies found students from Asian contexts demonstrate poor critical thinking, some research points to the cultural differences in thinking and limited students' limited skills to use English as the academic lingua franca. Asian universities must consult this debate to examine the validity of these dichotomous views. The present study investigated macro and micro strategies that academics adopt in their teaching and assessment procedures to enhance students' critical thinking skills at an Australian university in the schools of Physical Sciences, Engineering, Humanities and Business. The study included 20 in-depth interviews with academics and the qualitative analysis of 20 summative and formative assessment tasks. The study shows that critical thinking is an essential component in transforming students to be workplace ready in their fields. Thus, academics adopt particularly designed pedagogical strategies to cultivate critical thinking in their majors. The study indicates several challenges in developing disciplinary focused but holistic thinking with a subtle shift between scaffolded activities and independent learning. The study provides implications for pedagogy and curriculum measures for any higher education context.*

Keywords: Critical thinking, pedagogy, enculturation

I. INTRODUCTION

Critical thinking is an advanced cognitive skill that is integral to human ability but people need to cultivate this skill to face the world with an understanding and a critical mind set. One could advance their critical thinking skills during their socialization process but the skills that people unconsciously develop by interacting with the environment are inadequate to address the challenges in the modern society. Education theories such as constructivism (Twomay Fosnot, 1989) advocate the importance of fostering critical thinking in education curricula to equip students with their reasoning and analytical skills. Richards (2001) suggests that the responsibility of developing critical thinking lies with the formal education systems, particularly the higher education to foster and nurture these skills. Most formal educational programs, all over the world, seem to offer opportunities to develop critical thinking skills, by embedding critical thinking in disciplinary specific teaching, such as engineering (Niewoehner, 2006) and English language teaching (Thompson, 1999). Recent English for Academic Practice (EAP) research and practice have recognized EAP as an appropriate venue for the development of critical thinking skills while also enhancing language learning (Thompson, 1999; Paton, 2010). However, there is limited research on how current higher educational programs adequately facilitate students' learning.

Moreover, research shows dichotomous views about critical thinking skills of non-western learners because of the culturally different pedagogies (Durkin, 2010). Limited research addresses these issues and Gunawardena & Petraki (2014) report several challenges and tensions in embedding critical thinking focused tasks in EAP teaching in Sri Lanka. Their study shows that teachers need to be equipped with skills in incorporating critical thinking focused tasks in teaching EAP and other disciplinary subjects. The empirical study, reported in this paper, evaluates the pedagogical and assessment strategies used for enhancing university students' critical thinking skills in four schools in one university in Australia.

This paper will firstly discuss the importance of critical thinking skills and the debate about students' skills about Western and non-western contexts to illustrate the need for enhancement in critical thinking practice. Secondly, it will describe the process of data collection and analysis conducted in this study. Finally, it will examine the findings of this study providing implications for a critical thinking based pedagogy. The paper will then provide implications and recommendation for Asian education followed by a brief conclusion to this paper.

II. CRITICAL THINKING IN ACADEMIA

Critical thinking is considered an important general skill for successful completion of a higher degree course in the Western context as well as in the Asian contexts (AQF and SQEF). However, critical thinking is known as the preserve of the Western education (Paten, 2010) and thus these views has led to underestimate skills of Asian students (Kumaravadivelu, 2003). Recent studies such as Durkin (2010) based on Asian students indicate that there is a significant deficit in attention to critical thinking in Asian educational practices. As a result of this, Asian students who study in Western contexts get special attention and they are required to complete special courses to gain knowledge and skills in these areas. Durkin's (2010) study presupposed that Asian learners lack critical thinking and explored how Asian Masters' students in the UK to adapt to Western education styles. To address these plaguing criticisms, some contexts such as Singapore and China have explicitly embedded critical thinking focused tasks in their courses.

Kumaravadivelu (2003) argues that critical thinking debate has led to put Asian students into cultural stereotypical basket. He emphasises the fact that Asian students immensely suffer due to their inadequate English competencies. Also this lack of critical thinking may be a concern only for a few students that is being exaggerated by Western researchers or it is just a stereotypical labeling as Kumarvadivelu claims. However, a study by Gunawardena & Petraki (2014) identified several challenges and tensions that Sri Lankan EAP teachers encounter in embedding critical thinking in their teaching. Therefore, teachers would indeed benefit by examining other colleagues do in global contexts to promote deep thinking skills of their learners. This paper aims to provide several suggestions for enhancing critical thinking in academia.

One major issue that has resulted in a lack of understanding of critical thinking is how academics define critical thinking. It is used as a buzz word in many courses in academia and academics have their own perspectives about what critical thinking is. As Ennis defines critical thinking is "reasonable reflective thinking that is focused on deciding what to believe or do" (1989, p. 10). Ennis highlights the need for having reasonable or reliable premises for a decision or a belief that one arrive at in a particular context.

As Halpern (1997) defines critical thinking is a cognitive skill used to "increase the probability of a desirable outcome" and therefore it "Self-directed, self-disciplined, self-monitored and self-corrective thinking" Paul and Elder (2000). Critical Thinking involves numerous cognitive skills and therefore, students should these skills develop in their learning. They should be able to examine an issue or a concept through a critical eye and present a balanced argument that is being viewed from different perspectives without being biased on what is given even in an academic text. Intellectuals need to develop this skill in order to perform well by recognizing pros and cons of an action or a deed which will assure better practice. Therefore, developing critical thinking has a practical relevance and indeed useful for any one in any context.

Critical thinking is a relevant topic for investigation and it is a skill that needs cultivation in any context. Well-cultivated critical thinkers seem to act appropriately and professionally when making decisions and many developing countries need highly efficient thinkers who make wise and apt decisions for the betterment of the entire nations. Sri Lanka is poor developing country which has a higher literacy rates. Ongoing civil war had held it back from its development in the past and now it is regaining power relations in the international community. Therefore, it is imperative to offer an opportunity for a dialogue to encourage tertiary education contexts pay explicit attention to develop critical thinking skills of their students.

The important questions that emerge in this discussion are how and when critical thinking is

taught in educational programs. As critical thinking is an advanced skill, it may be highlighted in the tertiary education than in all other contexts. However, it is difficult to assume how other educational contexts organize their teaching without much prominent research about those contexts.

Teaching approach to critical thinking and assessment can occur differently in each discipline of education. For example: 1) In mathematics: using thinking to apply mathematical principles in realistic situations and solve mathematical problems. 2) In science: using critical scientific thinking to solve scientific problems and being able to analyze the validity of a theory. 3) In humanities: ability to recognize and evaluate strengths and problematic areas in relation to a particular concept or an issue. However, only a few studies investigate the pedagogy used in cultivating critical thinking. Therefore, the study reported in this paper examined pedagogical strategies and formative and summative assessment tasks used by experienced academics in a Western context to cultivate students' critical thinking. The findings will provide other higher education contexts opportunities for curriculum mapping and also it will provide a platform for academics to evaluate and reflect on their own pedagogy and assessment.

IV. RESEARCH QUESTIONS

The study basically focused on the following research questions:

1. What instructional strategies are used for CCT in academic disciplines?
2. What assessment strategies are used to assess developing CT skills?
3. What challenges are encountered in CCT in the higher education context?

V. METHODOLOGY OF THE STUDY

This paper reports on a mixed methods study that adopted 20 semi-structured interviews with experienced academics from four schools (Physical Sciences, Engineering, Humanities and Business) in a university in Australia. The major aim of the semi-structured interviews was to enable academics to describe their pedagogical interventions, assessment procedures and their tensions and challenges in regard to developing critical thinking, particularly in their courses. The interviews were audio recorded, transcribed and analysed using semantic analysis. In addition, the critical thinking focused assignments were analysed making judgment of the cognitive and other related skills involved in completing them.

Interviews are useful tools in qualitative research as they are more grounded and they allow the researcher to elicit human experience, viewpoints and attitudes towards a certain social concept. As Cohen et al. (2000) note, "interviews enable participants - to discuss their interpretations of the world in which they live, and to express how they regard situations from their own point of view" (p. 367). Therefore, researchers can find out what people commonly believe and they gain valuable insights into the important issues regarding a particular concept or topic. Interviews may be invaluable in some research studies depending on the specific research objectives. Interviews provide access to what is inside a person's head and make it possible to measure what a person knows (knowledge or information), what a person likes or dislikes (values and preferences) and what a person thinks (attitudes and beliefs). The study also analysed 15 formative and summative assessment tasks for arriving at conclusions.

VI. FINDINGS AND DISCUSSION

A. Instructional interventions for cultivating critical thinking

This study reports various pedagogical strategies used by academics to allow students an opportunity for developing their critical inquiry. Some widely adopted pedagogical strategies are field trips, demos, debates in class, group discussions, teacher student interaction/online forums, guest lecturers/experts, problem solving tasks, stimulus response videos and critical reading tasks accompanied by critical reading questions. These macro and micro tasks allow students to engage in critical inquiry and challenge their own thinking. One of the key elements in these tasks is the level of student interaction that promotes critical thinking. Academics in this study believed that students' exposure to a range of perspectives about one particular topic is useful. These views promote higher inquiry for learning. Thus, in lectures academics do not provide static answers to questions or theories. They often allow students to critique based on the provided evidence and to form their own theories. Thus, student generated

theories are useful their own learning rather than rote learning.

Rote or regurgitation is one of the main obstacles in developing critical thinking. When students are provided experts' theories, they tend to recall as they are and they believe them uncritically. However, when they are provided with different versions and perspectives, they tend to develop their understanding. Thus, another important aspect in leaning is reflective learning. The academics in this study reported the importance of reflective activities where students get the opportunity to reflect on their own learning and to make connections. Reflective tasks allow students to examine how disciplinary specific concepts or theories are applied in broader physical and social environment.

Another strategy that promotes higher order thinking is the teacher interaction as in poking and probing. Teachers must stimulate discussion to allow students to see the three-dimensional view of a particular concept or a perspective. McLaughlin & Luka (2000) argue teacher interaction as in questions provides more opportunity for students think about the relationship between the academic concepts. Therefore, group discussion led by teachers seems to provide more opportunity for lifelong learning and connection.

B. Assessment strategies for developing CT skills

Academics in this study highly regarded effective assessment tasks as contributors to develop critical thinking skills. They adopt a range of micro and macro formative assessment tasks to allow students opportunities to develop subject specific knowledge, knowledge application dynamics and critical thinking. Some widely used tasks are group challenges, problem solving, argumentative and expository essay questions, case study analyses, reflective journal writing, peer reviews, presentations, and critical reviews, reading tasks, role plays/simulations, e-portfolios and synoptic essays (reflecting on what you learn. These tasks are used alternatively both as macro and micro tasks depending on the need and academics' professional judgment. Some of these tasks are used as group or individual assessment.

It was noted that the most assessment tasks were organised in a similar pattern. The tasks mentioned above provided a stimulus for engaging students and they were then provided time for critical research and to write their response. Once the response is received by the staff, they evaluate students' work and provide feedback and appropriate grades. The study found two common different designs in the organisation of the assignments: linear design and the circular design (see figure 1 and 2 below).

Figure 1: Linear design

Figure 2: Circular design

While linear design is more suitable for summative tasks, the circular design is more suitable for formative tasks. When the tasks are organised in the circular order, students get more opportunity to reflect on teacher feedback and demonstrate critical thinking skills. Effective teacher feedback is critical in cultivating critical thinking skills and it allows both students and teachers' an opportunity for reflection. However, linear design is less effective as students would only concentrate on the mark given not on the feedback on their responses and it does not provide opportunity to rethink and think on the directions given by experts. This highlights that the mark is less important and the feedback is more important. As Sadler (2010) argues teachers need to develop a systematic feedback procedure and develop an appraisal system to help students to act on feedback.

C. Challenges and tensions

While the academics in this study consider developing students' ability for critical thinking is one of their major role, "*They (critical thinkers) blossom in any field*" (P. 10.), "*as they are holistic thinkers*" (P.10), they face several challenges in their practice. One participant pointed out that there is possibility for an academic to disregard this skill but teach only the subject content:

> *That's why it's really important to teach it (critical thinking) when you do have the opportunity because you don't want a student going through their entire Engineering degree and not being able to think critically, but it's theoretically possible to do that.* (P 1)

Therefore, it is important to pay explicit attention to critical thinking skill and carefully organise activities to engage students. The challenges were categorised as shown in figure 3 and 4 below:

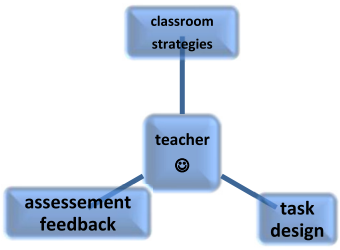

Figure 3: Teacher-related challenges

Figure 4: student-related challenges

The most common challenges (both teacher and student related) that the majority face are giving students sufficient and effective individual feedback, students' limited experience in directing higher order thinking and their skills of in-depth reading and effective writing in academia. The discussion in the previous section has also noted the need for holistic circular feedback to develop critical thinking. This is a challenge that many academics face in any context as a result of their heavy workloads. This study suggests that there is indeed a crucial need for developing effective measures to provide feedback to our learners to ensure that they understand and can act on feedback.

Students' limited experience in using higher order thinking is another major challenge that needs addressing. In the process of academic enculturation, perhaps students need to be scaffolded more, until eventually they develop independent skills. This study saw the divided views about scaffolding: some academics thought scaffolding is not necessary for every student. Therefore, they seem to provide guidance, if necessary and required. Too much scaffolding can obstruct independent thinking and creativity in students' learning. This is highly a professional judgment and can depend on the intellectual level of learners.

As generally agreed, students need to have advanced skills in reading and writing to be able to understand academic arguments and complex theories to translate them into their own words and communicate effectively in learning. The students who do not have enough language skills tend to plagiarise (Devlin and Gray, 2007) and will not engage in deep learning. This illustrates the higher levels of challenges that non native speaker students who learn in English medium face in their learning. If students are not prepared academics encounter difficulties in scaffolding students learning. As Vygotsky points out academics should only provide effective scaffolding within the proximal development zone (Wass et al., 2011). Otherwise, students face difficulties in comprehension.

D. Implications and recommendations

The study has revealed that choosing the appropriate pedagogical intervention and assessment are necessary for effective practice in developing critical thinking. Research and practice in higher education acknowledge that traditional knowledge based acquisition strategies do not contribute to cultivating adequate levels of critical thinking skills (Sternberg, 1986). Barnett (1997) claims that even though academics are in favour of

critical thinking, they have "no proper account of it" (p. 2). While some explicitly teach critical thinking, others expect students to nurture thinking implicitly while taking opportunities provided in their courses (Tapper, 2004). This study shows that academics adopt numerous explicit strategies and the reflective activities are the most useful ones to help students make connections with their learning.

The current study highlighted that teachers do have theories about their teaching and these theories are generated with their experience in student learning. This confirms Fox (1983) argument of the contribution of teacher-initiated versus student-initiated teaching theories. Fox's classification indicates that teachers do seem to develop their pedagogy by working with students and reflecting on the perceptions they develop over time about student learning. However, education policy and graduate attributes help them to initiate their pedagogy.

VII. CONCLUSION

This paper has reported on the findings of a qualitative study that inquired assessment and pedagogical strategies used in cultivating critical thinking skills in an Australian university. It has analysed the strategies used in teaching and assessment and it identifies several useful strategies to develop critical thinking. The study shows the importance of reflective exercises that allow students to expand thinking by evaluating the use of academic concepts in disciplines. It has also discussed the importance of effective teacher feedback to stimulate students' critical thinking skills.

The study indicates several teacher-related and student-related challenges in academic practice. Some academics seem to negotiate these challenges but they require more systematic and consistent support to negotiate such challenges. These findings suggest that universities need to move forward developing effective strategies for pedagogy and assessment, particularly introducing strategies for effective feedback. If a university course is only comprised with knowledge based testing, there is little possibility for course takers to develop critical thinking. As critical thinking is the long lasting legacy of higher education, course convenors must pay full attention to develop critical thinking in their courses and allow students engage in thinking based tasks to offer opportunity for learning transfer to occur across disciplines. Local Universities must address the English language deficit to help students to engage in deep learning, if they choose to use English as the *academic lingua franca*.

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