

Teaching, Testing and Evaluating Critical Reflection: A Personal Experience

Kay Fielden

School of Computing and Information Technology
Faculty of Business, UNITEC Institute of Technology
kfielden@unitec.ac.nz

All course outlines in the MComp degree at UNITEC state that students will learn how to critique issues relating to the topic being studied. The assumption is that critical reflection is a skill that is acquired automatically during the degree. Postgraduate students at UNITEC are required to complete the Research Methods (RM) paper before enrolling in a thesis or dissertation. RM students are encouraged but not required to keep a reflective journal. This paper reports on the effectiveness of keeping a reflective journal by analysing results obtained over the last five semesters.

Keywords

Critical reflection, Postgraduate education.

1. INTRODUCTION

The challenge addressed in this paper is the assumption that PG students acquire critical reflection (CR) skills automatically during the degree. In order to address this challenge the final test undertaken by all students over five semesters were analysed.

A series of questions are posed about the effectiveness of attempting to teach and evaluate critical reflection explicitly at the postgraduate level. Students undertaking research methods in the MComp degree program were encouraged, but not required, to keep a reflective journal during the semester. Reflective journals were not assessed or evaluated in any way and remained private and confidential to each individual student. Results of the content analysis of the final test of 110 students who have undertaken Research Methods over five semesters are presented with unexpected results.

2. REFLECTION

Reflection

Going beyond

Boundary setting of others

Journeying now

Into inner and still

Feelings recorded

Shape-shifted in flow

Chasms appearing

From anchoring start

Boundary setting of others

Bridging the gap

Wanderers returning

Own treasures to share

Heart-rendered accounts

- or reports to be scored

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(Barnett, 1997) suggests that criticality has the following dimensions: transformational or reconstructive; an understanding of how ideas relate to various traditions; reflexivity or self-reflection; and the discipline or self-monitoring of critical thinking. (Brookfield, 1987) describes reflection as 'the process of hunting out our assumptions and critically examining them'.

Critical reflection therefore is a multi-faceted activity that takes place internally within each person. It involves the ability to look at the self, the self in relation to others and to the world at large. Reflection embraces the ability to 'stand back from the self' and examine critically own thinking patterns. Critical reflection also requires an internal honesty

and integrity as we examine our own thoughts and assumptions. Critical reflection is necessarily an individual activity initially.

Educators have explored the finer points of becoming a reflective practitioner in attempting to work out the best strategy to encourage students to become reflective practitioners ((Atherton, 2002b) (Ballantyne & Packer, 1995) (Brookfield, 1987) (Evans, 1997) (Goatley, 1999; Hunt, 1997; Imel, 1992; Schon, 1987)). Course requirements at the postgraduate level require students to become ‘critically reflective’ – therefore critical reflection is essential for the successful completion of the Mcomp degree at UNITEC. Without critical reflection students are unable to interpret research findings gained from analysing research data gathered, reading and reflecting on pertinent literature, and self-reflection of their role as researcher in the process of research.

2.1 Critical Reflection in the Mcomp Program

Learning Outcomes (LO) for the research methods paper are to:

- Establish the basic requirements for research;
- Select, analyse, critique and synthesise literature / information pertaining to a potential research topic;
- Identify and apply methods of formulating solution procedures and construct a draft research proposal;
- Experiment with the various techniques used for analysing quantitative and qualitative observations to establish their appropriateness and limitations;
- Use a critique of other proposals to improve the initial draft research proposal; and
- Determine the content and appropriate style of presentation together with the tools used for presenting results.

Critical reflection is an underlying skill required for all learning outcomes, but most particularly for selecting analysing, critiquing and synthesising (LO2).

3. LITERATURE REVIEW

A common feature of higher education learning support centres is a series of helpful hints on how to keep a reflective journal. For instance, on the Uni-

versity of Technology Sydney’s learning centre website hints given are: recording events and results and reactions to these; data upon which to base reflective discussion; opportunities to challenge the self; impetus to take informed action; and a means of developing a personal philosophy. These reflect very (Bain, R., Packer, & Mills, 1999) 5-stage reflective model represented in Table 1.

(Evans, 1997) states that ‘reflective practice’ offers a highly challenging paradigm of learning. He suggests that learning to derive abstract generalizations from specific practices, events or thoughts is inductive learning; which is diametrically opposed to the dominant paradigm of deductive learning.

(Brookfield, 1987) suggests that the core properties of critical thinking are: to identify and challenge assumptions, and to imagine and explore alternatives. He also suggests that the processes of critical thinking are: person specific – people vary greatly according to personality, culture and gender; dependent on emotions – emotional releases are central to challenging assumptions - both intrinsic and extrinsic; unexpected or insightful (and this may happen long after the period of instruction); and that peer support is crucial for critical thinking skills to mature. Brookfield also believes that there is no standard model for facilitating the development of critical thinking and that diversity of methods and material is required. Accepting imperfections of self and others in developing critical thinking. Critical thinking often only happens after a period of frustration and struggle.

(Hunt, 1997) describes the ‘felt reality’ of ‘doing reflective practice’. A most insightful comment from Hunt ‘. . . often, though, I realise that I am the only person who already holds the key to understand why I have initially interpreted and reacted to a situation in my professional practice in a particular way – but in order to find it I will have to look into the shadows of my own mind.’ Hunt believes that we must be willing to cross and re-cross consciously the borders in our minds between the light of what is already known and the shadows where ideas, thoughts and connections lie hidden or at best, only dimly perceived. Such crossing and re-crossing involves changing perspectives of the self and the relationship of the self to the outer world.

Recrossing mind borders is often a painful and messy business easily lost in busy lives. Most post-

Hunt also suggests that encouraging students to become reflective practitioners is about ‘holding the learning space’ from which they start on their personal reflective journeys. She also suggests that giving feedback on reflective practice should be sensitive to the intensely personal journey of each individual student. Teaching students to become reflective practitioners is also about keeping organisational boundaries and maintaining a home base. There is a dilemma here – organisational writing and writing styles is about as far from critical reflection writing as you can possibly get. Imel, (1992) suggests that reflective practice is a mode that integrates or links thought and action with reflection.

4. RESEARCH QUESTIONS

In attempting to understand how postgraduate students become critical practitioners the following research questions were posed:

- Can Critical Reflection be taught?
- If Critical Reflection can be taught how can it be evaluated?
- Is a reflective journal an appropriate tool to reinforce critical reflection skills for postgraduate students?
- Is a reflective test an effective way of evaluating critical reflection for postgraduate students?

5. RESEARCH METHOD

Having taught this paper for five semesters and observed how difficult it is for students to develop critical reflection skills, I decided to analyse the reflective tests from the end of each semester. Even although the course is delivered inductively and reflectively emphasising underlying philosophical approaches to research in computing it did not appear that critical reflection was skill that could be taught inductively or by example. Each semester the students took part in a reflective test (Figure 1). Whilst there were no direct questions on keeping a reflective journal, each test had questions that required the student to consider what it meant to keep a reflective journal. Hence, content analysis was applied to the tests accumulated over 5 semesters to extract the responses that related to issues involving research journals. All students who have undertaken the research methods paper in the MComp

graduate students belong to one of the following groups: part-time, mature and balancing family, work and study or full-time and studying in English as a second language away from family and own culture. In both cases their lives invariably have conflicting demands on time and intellect. In both cases there is considerable self-discipline required to form the habit of keeping a reflective journal.

A major dilemma is that the final product of this reflective practice is a research report, proposal, dissertation or thesis. Such documents are required to be written in an academic language that is highly stylised and uses English in a unique manner that is formalised and rigidly expressed.

Question 3
marks]

[Total 10

Research Process

a. Describe briefly three important factors required to control and monitor research process.

1.5 marks

b. List all the ways in which you controlled and monitored your research process in Research Methods 804 this semester.

5

marks

c. Describe briefly how the ways in which you controlled and monitored your research process helped you to develop your researching ability.

2.5 marks

d. Discuss briefly how the ways in which you controlled and monitored your research process could be improved.

1 marks

Figure 1

degree were encouraged to keep a reflective journal and all students were evaluated with a reflective test at the end of each semester. A bank of reflective questions has been developed for these tests and each semester the questions are changed. A typical question is shown in figure 1. Direct questions on critical reflection are not asked – rather the questions are designed so that students can demonstrate their reflective abilities.

5.1 Data Collection

110 reflective tests over five semesters were analysed to find out whether the students believed that critical reflection was a core research skill and whether they stated and commented on keeping a research journal.

The research questions posed were: Can Critical Reflection Be taught? If Critical Reflection can be taught how can it be evaluated? Is a reflective journal an appropriate tool to reinforce critical reflection skills for postgraduate students? Is a reflective test an effective way of evaluating critical reflection for postgraduate students?

5.2 Data Analysis

43/110 students stated explicitly that they believed it was important to keep a critical reflection journal. 28 of these 43 students reported in the test that they had formed the habit of keeping a journal. 3 students stated that they were forming the habit, one had ‘started’ to keep a journal and 8 had not kept a journal – although they reported that ‘keeping a journal is a good idea’.

According to Bain *et al.*, (1999) 5 point reflection level scale (Table 2) those students who did not keep a journal – but knew it was a ‘good idea’ had not even reached level 1 – reporting – on this scale. From this particular sample 26/ 110 students achieved some level of reflection once the habit was formed. Being aware that it is a good idea to keep a journal – but not doing it is not conducive to developing critical reflection skills. 6/43 students were in this category. 67/110 however did not even report that keeping a journal was important. Most high achievers in research methods reported that keeping a journal was important to develop critical reflection skills. There are anomalies in this sample – 1 student who achieved level 5 (reconstruction) who did not keep a journal – but who had kept research notes; and 1 student who had not formed the journal habit and also achieved level 5 on Bain *et al.*’s scale.

5.3 My reflections on analysing the tests

When I reflected on the research questions posed: Can Critical Reflection Be taught? If Critical Reflection can be taught how can it be evaluated? Is a reflective journal an appropriate tool to reinforce critical reflection skills for postgraduate students? Is a reflective test an effective way of evaluating critical reflection for postgraduate students? I realised that I had not answered these questions directly by analysing the students’ reflective tests. I still do not know whether the reflective test is an appropriate evaluation tool. What I do know is that it gave the students an opportunity to debrief

Table 2: Journal keeping, habit forming, and Bain et al's (1999) reflection levels

	Nothing	Reporting	Responding	Relating	Reasoning	Reconstructing
	0	1	2	3	4	5
JOURNAL						
Habit formed	7	11	6	2	2	
Habit forming		1		2		
Habit started		2				
No Habit						
NOTES						
Habit formed		1			1	
Habit forming						
Habit started						
No Habit	1					
NO JOURNAL						
Habit formed						
Habit forming						
Habit started						
No Habit	5	1			1	
TOTAL (43)	6	11	12	8	3	3

a semester's learning, development and skills acquired. Because 61% of the students did not include responses relating to keeping a journal I cannot answer this question. I am still not sure whether critical reflection can be taught. For the majority of students who did acquire the habit of keeping a research journal they did achieve a score on Bain *et al's* scale (1999). For those who did not report anything about journal keeping, their tests did not convey any level of critical reflection from this content analysis. My belief that demonstrating and role-modelling critical reflection seems to be unfounded from this particular sample. My intuition suggested that this would be the case. 'Holding the boundaries' Hunt's (1997) was certainly practiced in this paper. Because it was not stated it was not in the students' conscious awareness and therefore not something that could be addressed in a test whether it was reflective or not.

My expectations before I analysed the tests were that most of the students would have developed critical reflection skills by the time they sat the final test. What actually happened was quite different. Only

28% reported any level of reflection and only 3% achieved level 5 (reconstruction).

It appears therefore from this sample of 110 post-graduate students that learning to keep a critical reflection journal is not an automatic skill that can be acquired over one semester. One student reported (a year after completing research methods) that she only started to keep a journal when she really needed it – when she was doing her thesis.

It seems important to recognise that to acquire critical reflection in research is a skill that matures as the researcher gains competence, experience and maturity. Even although I still do not know whether critical reflection can be taught, it seems to be important that acquiring critical reflection skills develops and matures with time and practice. Keeping a reflective journal starts the practice. Introducing critical reflection is important in the research methods paper. It is however important to realise that students acquire critical reflection in their own time. There appears to be a link between keeping a critical journal regularly and developing critical reflection as a skill. Those students who did not keep a

journal (67%) did not achieve a reflection score on Bain *et al*'s (1999) scale.

Initially this was a disappointing result, especially when critical reflection skills had been taught and reinforced in both assignment work and the final test. The subsequent realisation is that critical reflection cannot be taught in one 'hit'. This cohort of students was developing critical reflection skills at their own pace as indicated in Table 2.

5.4 Does the Reflective Test Evaluate CR skills effectively?

According to feedback from students, they believe that keeping a CR journal certainly helped them to:

- Pass the RM reflective test;
- Equipped them with appropriate critical thinking skills to complete a thesis or dissertation;
- Helped them to acquire life-long learning skills;

Students believe that they could not have completed the test successfully if they had not kept a CR journal.

Students who did not heed the advice to keep a CR journal said that it affected their marks in the test. More importantly, these students did not acquire CR skills.

5.5 Emergent Results

Besides demonstrating the vital role of keeping a CR journal, this research has shown that a reflective test can provide the opportunity for students to debrief during this final test. Students wrote in the test that they appreciated the opportunity to 'write things down and to say what was really important to me'. Not only did the test provide a time and a place to debrief, it also provided an opportunity to demonstrate the level of CR achieved.

I am still no clearer about whether CR can be taught. I think that clear boundaries and environment setting are more important than 'teaching'.

The test viewed as a debriefing device provided the students with the opportunity to complete the learning process in the same semester. Many times a test leaves students with a sense of incompleteness, that the process stopped midway, and that the students still needed to talk about what had happened.

6. IMPLICATIONS

It seems to me that as a PG educator I know very little about how to encourage students to develop their own CR skills and practice. I can encourage, role-model, demonstrate, provide exercises, give feedback and test whether students can show they know what CR is. But because the development of CR is such an individual and personalised skill and practice, I do not know what is going on inside in each student's head. It seems to me that the best I can do is to know more about how I interact with students as they develop individually on their reflective journey; to know when to encourage and when to stand back; when to allow students to falter and when to direct a course of action. The relationship between CR skills and rationality required in the rest of the research process is something that requires further examination.

Contrary to the external monitors' suggestions (MComp monitor's report, 2002) that the reflective test was not an appropriate evaluation tool for a research methods paper, my experience over 5 semesters has demonstrated effectiveness well. The unexpected outcome that the test was also a debriefing device provided a sense of completion to the learning process for the students involved. Concentrating on elements of the research process rather than mechanistic research skills has encouraged and reinforced students' critical reflection skills to progress up the reflection skill ladder (Bain *et al*, 1999).

7. CONCLUSION

Keeping a CR journal appears to be an essential element for most students in this sample as they become postgraduate researchers. If students keep a CR journal then they will start on their individual journey towards becoming a researcher. If they do not keep a CR journal it is highly unlikely that CR skills will develop automatically. It seems such a simple and logical solution to improving pass rates at the postgraduate level – but it is not. CR skills are individual, emotionally-charged, and highly personal. It requires gentle but firm direction to transform personal reflection into academic outputs. Most of us stumble when we are required to be gentle but firm with our students.

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