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Creating the need to access peer knowledge: Changing the learning culture in Teacher Education through learning design

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ABSTRACT

Over the years, traditional teacher-centric and content driven teaching explanations in textbooks and unit outlines have been infused with student-centric pedagogical descriptors. How these rhetorical changes have affected teaching and learning habits in teacher education is what is under investigation in this paper. The findings of this exploratory study suggest that learning design can enable greater peer collaboration and interaction. However, the increased interaction does not necessarily equate to deeper processing of information. The conclusion is reached that unless the value-added nature of increased peer interaction and collaborative inquiry is better understood by teacher educators and student teachers; it is unlikely that habitual learning behaviours will change.

Keywords: Teacher education, nonformal learning, learning design, Learning Management System

Introduction

Informal, nonformal and incidental learning seem to gain traction in higher education and elsewhere. However, changing formal and entrenched learning and teaching cultures in school education, higher and further education is not easy, as socio-cultural practices are habitualised and taken-for-granted (Arora, 2010; Dowens, 2010; Eacott, 2010). In a typical Australian undergraduate teacher education course the most common pedagogical approach utilised to introduce students to new knowledge and develop their skills is through well-structured lectures and tutorial sessions (Phillips, 2005; Webster, 2009). What is under investigation in the reported study is not so much the learning content, but rather the processes that are utilised to make learning happen and share new knowledge about innovative teaching practices, which has been referred to in the recent contemporary educational literature as 'learning design' (Dalziel, 2009). To support changes to the culture of learning and teaching in school education in future years, teacher education pedagogy, that is, how student teachers are experiencing learning and teaching processes through the engagement with the subject matter, learning material, each other and the teaching staff, will need to be scrutinised. Therefore, the focus of the research was on learning design in the context of teacher education at an Australian university.

Over the years, traditional teacher-centric and content-driven teaching explanations in educational psychology texts (O'Donnell, Dobozy, Bartlett, et. al., 2011) and undergraduate unit handbooks (Wren & Byrne, 2011) for teacher education students have been infused and even exchanged with more student-centric pedagogical descriptors. Moreover, a quick search on the ***informa****world*^{TM} platform, which offers a cross-sectional search option of academic journals, eBooks and encyclopedias, makes apparent that new educational terminologies such as 'communities of inquiry', 'research-informed teaching', 'learning networks', 'situated learning' and 'self-directed learners' become accepted jargonistic tools of contemporary teacher education academics and trainee teachers (see Cilliers, 2010; Carrington, Deppeler, & Moss, 2010; Lieberman, 2000; Mok & Lung, 2005; Schunk, 2008; Zimmerman, 2008). Not surprisingly, there are a raft of terms and meanings associated with the above-mentioned phrases (Robertson, 2007). Although as new terms become fashionable in the field of education (see Dobozy & Hellensten, 2009) the change in rhetoric is often not matched by enacted teaching practices. After conducting a global study on pedagogical practices in contemporary classrooms, Shear, Novais and Moorthy (2010) conclude:

> [The] gap between the rhetoric of change and the realities of classrooms range from lack of access to resources and training to lack of clear expectations in systems that are still organized and incented towards traditional measures of achievements. Most students still experience instruction that is largely lecture-based, and extensive national education investments in technology have not yet resulted in widespread transformation of learning opportunities (Shear et. al., 2010, p.1).

The research finding reported by Shear et. al. (2010) is mirroring similar reports by the OECD (2009) and EU (2010) concerning the lack of improvements made in changing pedagogical practices in school education after the implementation of ICTs in schools. From a Bourdieuian dispositional theory of action perspective, commonly referred to as the study of habitual action or 'habitus', this does not seem to be such a surprising finding. Pierre Bourdieu's (1977, 1990) work is seen most useful in understanding the resistance to cultural change by teacher educators and trainee teachers. There is a dialectical relationship between the learner and the learning environment as the learner is socialised into particular 'ways of being a student', the cultural experiences as forms and habits of cultural behaviours and role expectations of learners and teachers. The dialectic relationship as outlined by Bourdieu (1977) refers to this mutual influence between the individual, the situation and past experiences and the presence or absence of certain characteristics of the learning environment. Bourdieu (1977) explains that the "product of a dialectical relationship between a situation and the habitus, understood as a system of durable and transposable dispositions which, integrating all past experiences, functions at every moment as a matrix of perceptions, appreciations, and actions" (p. 261). These expectations of actions and behaviours, underpinned by past experiences are deeply influential in shaping perceptions of 'quality' teaching and learning experiences and role expectations. For example in a traditional school environment, the expectation is for a teacher to 'teach' and for students to 'learn' in the sense that students will be diligently taking notes and answering teachers' questions in an attempt to acquire information from the teacher to develop new skills and knowledge as modeled by the (expert) teacher. Hence developing a 'different mindset' concerning the value of nonformal teaching and incidental peer-supported learning, requires the development of new cognitive structures and role expectations of both students and teachers (Fullan, 2008).

Against a backdrop of engrained cultural practices and attempts to shift these deep-seated cultural practices in teacher education, the research investigated if designing for nonformal, self-directed and, peer-assisted learning will prompt increased non-teacher-directed student interaction and if it so, will it also lead to increased understandings and appreciation of the value of this form of education practices. Hence, in this paper, the concept of 'nonformal education' and Bourdieu's idea of 'habitual action', which were used as a theoretical framework for the study of peer-to-peer learning and interaction, will first be defined and explained. This is then followed by an outline of the investigation of student peer-to-peer communicative behaviour in a core teacher education curriculum unit. Finally, the results of the case study will be discussed and possible implications outlined.

Nonformal education

Nonformal education (NFE) is a way for students to learn 'in situ' through peer-to-peer collaboration and information exchange. The learning design is inherently student-centric as the learning is instigated through a need for understanding and specific knowledge in an environment of shared inquiry with others, in the search for the most appropriate information. It is nonformal in the sense that it is entirely voluntary and participants are free to contribute actively to discussions and debates or take part as 'a social visitor' (Dobozy, 2011a). The relationships between participants are less

formal and the learning environment is less structured when compared to traditional 'schooling', providing opportunities for fluidity and multidirectionality. As Kleis, Lang, Mietus, & Tiapula, (1973) convincingly explained:

> Non-formal education is discriminated from incidental and informal education in that it is intentional and systematic. More significantly, non-formal education is distinguished from formal education not by the absence of form – but by the persistent subordination of form to mission. (Kleis et. al., 1973, p. 10)

There is agreement among contemporary educational researchers that NFE is 'intentional' and 'systematic' and is distinguishable from formal and informal education. Nevertheless, there is, so Fennes & Otten (2008) posit, an acknowledgement of the interrelationship among these forms of education. They note that "numerous definitions of [NFE] exist which differ from each other in different facets with respect to process, location and setting, purposes and content. It can be questioned, if it would be desirable or possible to establish a commonly agreed definition for [NFE]" (Fennes & Otten, 2008, p. 11). Given this variation in conception of NFE and the fact that NFE is provided in combination with formal lecture and tutorial offerings, the present study was utilising the definitional direction provided by Kleis et. al., (1973) and Zimmerman (2008).

Self-regulated NFE/learning, which Zimmerman (2008) defines as "the self-directive process and self-beliefs that enable learners to transform their mental abilities, such as verbal aptitude, into an academic performance skill, such as writing" is at the centre of pedagogical change practices, as outlined here. Core to successful participation in NFE are the concepts of metacognition and self-regulation (Schunke, 2008), which engender the generation of cues and internalising three key feedback questions (Hattie & Temperley, 2007, p. 86):

1) "Where am I going", or what is the desired outcome (How is this new learning related to my previous learning)?
2) "How am I going", or what does the assessment evidence tell me about the effectiveness of my learning strategies (If there are gaps in my learning-to-learn skills, what are the possible causes)?
3) "Where to next", or what could/should be the next step (Do I want to/need to change my attitudes, beliefs or values)

A great number of researchers studied peer-assisted learning and have found that active learning through the provision of explanations are expressions of deeper processing of information and hence associated with higher levels of achievements (Arora, 2010; Bennet & Bennet, 2008; Dobozy, 2011b; Loynes, Magda & Rikers, 2008; Phillips, 2005 etc). NFE/learning is usually structured and intentional, but the learning process and learning outcome is controlled by students rather than the lecturer or tutor.

Microblogging as NFE/learning

The microblogging platform embedded within the case study unit's Blackboard site, the university's learning management system, was set up for active exchange of ideas and knowledge construction through spontaneous interaction and debate concerning anything to do with the unit. Hence, microblogging was used as a proxy for the study of the effectiveness of NFE learning design. Students enrolled in the unit with the experimental (NFE) learning design had access to the site and were encouraged to exchange their ideas and experiences and seek help from each other.

The experimental learning design of the unit and the significance of NFE/learning for personal development were formally discussed in the first lecture. In particular, the peer-to-peer collaboration, preferably through the microblogging site, was promoted not only as a strategic learning tool, but also as a pedagogical method to be utilised in school education. The advantage of asynchronous forms of discussion were introduced to students as the provision of fast many-to-many, interactive, text-based communication bites (Brewer & Klein, 2006). Moreover, education research suggests that active participation in asynchronous discussion facilitate self-directed learning (Jonassen et al 2005; Kim et al 2007), which should result in improved academic performance as it provides students with additional practice time and reflection.

The study

My interest in understanding why the prevailing pedagogy in teacher education at our university was only slowly shifting from teacher-centric to more student-centric teaching and learning practices although the rhetoric has successfully changed, led me to conduct a case study of the uptake by students of nonformal learning offerings of the experimental unit. Following ethics approval for the study, student participation in NFE/learning through the unit's learning management system (Blackboard) was closely monitored. This data was then compared with online peer-to-peer interaction (also through Blackboard) in another core unit of the same student cohort.

In complex learning and teaching situations, such as the one used in the experimental unit, the teacher introduces an ill-structured and complex problem task that cannot be completed by a single student alone and to which all students can contribute. As the students come to recognise that it is of advantage to collaborate on the problem deconstruction and project planning, it is anticipated that they also come to recognise that some students have many skills that are often complementary. The focus on innovative thinking and problem-solving using online peer-to-peer communication needed to accomplish the task at hand allowed for the inclusion of many students' ideas. This learning design also sought to encourage students to be task oriented and deeply engaged with their learning (Bennet & Bennet, 2008; Dobozy, 2011b).

Second year teacher education students enrolled in a core unit entitled: *Society & Environment* were required to collaborate with each other on a major assignment that required them to design a 'ready-to-be-used' Webquest for an upper primary class satisfying the learning outcomes of the History or Geography outcomes as specified in

both, the state curriculum documents and the new Australian curriculum documents. The webquest assignment task design was chosen with an aim of enabling higher order thinking, the integration of web resources and the scaffolding of peer-assisted learning and advanced cognition (Mok & Lung, 2005). It is a carefully scaffolded learning structure that uses links to essential multimedia resources, either available on the internet or scanned hardcopy text materials as authentic group-based or individual learning tasks (Marsh, 2007).

The goal of the specific learning/assignment design was for trainee teachers to (a) experience nonformal, inquiry-based teaching and learning, and (b) understand the value of NFE and incidental learning design that aims to provide the context for peer-to-peer collaboration and can stimulate deeper processing of information, more focused activity and less-demanding cognitive load on an individual student (Alexander, 2008). Both of these goals are stipulated process-related outcomes of the learning area *Society & Environment,* which differ from the more traditional learning outcomes that require specific content knowledge, such as Australian history learning outcomes and Physical or Human Geography learning outcomes.

Research aim

The research was conducted to see if the inquiry-based learning design, which still offered traditional lectures and tutorial sessions, but deliberately refrained from teacher-directed 'heavy scaffolding of learning' would prompt students to utilise each other as a valuable source for learning. Instead of providing traditional teacher-centric learning experiences, the case study unit used an ill-structured assignment design, requiring of students, so it was anticipated, to resort to peer-to-peer support in sense making of the task and solving of various problems along the way. Nevertheless, detailed descriptions, assignment evaluation rubrics and worked examples were provided to students.

Hence, this small in-house study aimed to provide explanations to the following questions:

- Is it possible to encourage 'in-situ' peer-to-peer learning through NFE learning design?
- How influential is the present learning design in changing teacher education students' perception and appreciation of NFE and peer-to-peer learning?

Sample and method

The target group was a teacher education cohort (n=233) enrolled in a core unit in 2010. A 'microblogging' site was established using the university's learning management system (Blackboard). Students were familiar with the system and have used it in the past primarily as a 'resource site', collecting lecture notes and reading course-related announcements posted by the lecturer. This use of the customary learning management system (LMS) is, so recent Australian and international research has shown (Dobozy, Reynolds & Schonwetter, 2011), quite common.

For benchmarking purposes, LMS communication logs from another compulsory unit's discussion board offered to the same student cohort in 2011 were used to establish a baseline of online peer interaction. The benchmarking unit also required of students to complete a project assignment, but it used traditional teacher-centric pedagogies. The discussion board is a standard communication feature in Blackboard and students are familiar with it. To encourage social networking among students in the development of their webquests (project assignment) in the experiential unit (case study site), an additional space was created and referred to as the unit's 'microblog', a facility which allowed for greater monitoring of student interactions.

The major difference bewween the benchmarking unit and the case study unit was the pedagogical approach chosen by the lecturer. Instead of utilising an inquiry-learning approach, ensuring a need for much student-initiated NFE/learning, the lecturers and tutors of the benchmarking unit used a traditional teacher-centric approach to the project development, engaging students in a step-by-step, tutor-led working environment. The LMS was, thus, used mainly as a document repository rather than for learning and communication purposes, except for the occasional announcements posted by the lecturers. This data provides support for research findings of earlier studies (Ashford-Rowe & Malfroy, 2009; Dobozy, Reynolds & Schonwetter, 2011) that document the use of LMS by lecturers and students as a low-level transitional site rather than as an additional pedagogical tool.

As a preliminary investigation of the communication pattern of the benchmarking unit's 'discussion board' reveals, the online communication exchange for the semester can be described as being very low, totaling only 7 entries. No data of 'views' or 'hits' is available. Figure 1 shows information, which established the baseline data of 'typical' student behaviours concerning online peer-to-peer interactions of this student cohort in a teacher-centric learning environment. Although the tutors encouraged students to make use of the online communication space, anecdotal evidence of the past has established that there is generally minimal activity recorded on discussion boards.

It is of significance that online peer-to-peer communication was not compulsory in both the benchmarking unit and the case study unit. Hence, online peer-to-peer communication was not attracting any assessment points for students. Earlier studies have shown that teacher education students at this university are highly strategic in their approach to learning and will contribute to online discussions if they attract even very small amounts of assessment points (Dobozy, 2011a). This behaviour is consistent with that of other students, as the study reported by Goodyear & Ellis (2007) illustrate.

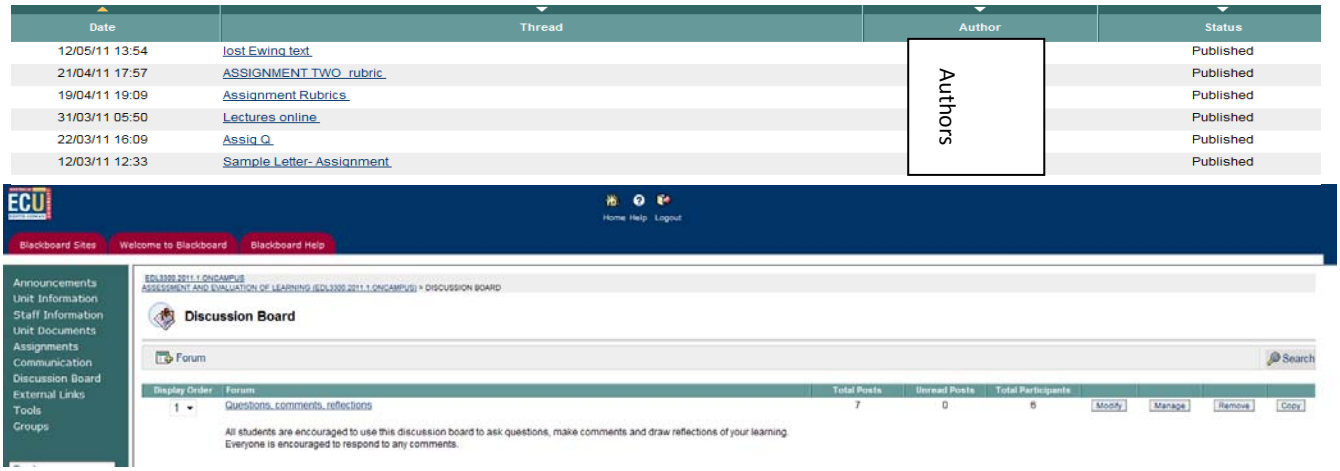

Figure 1:
Baseline data of 'typical' student online behaviour

The LMS communication pattern of students enrolled in the case study unit was quite different. Figure 2 shows the total communication exchange of the case study unit's 'microblog' for the semester as totaling 84 entries. The intention of the learning design was to encourage students to use the LMS more as a communication and collaboration tool rather than a resource repository. As students grappled with their assignment requirements, they were encouraged to use each other as a resource and experience informal networking and collaboration. Using a post-facto design, students' online collaboration on the 'microblogging' site was carefully monitored. In conjunction with the microblogging data, the study also made use of data from students' end-of-semester teaching evaluation and personal email or face-to-face communication logs.

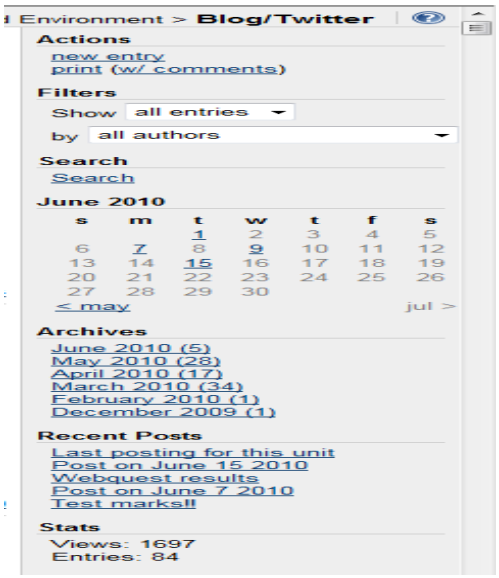

Figure 2:
Case study data of online communication via unit microblog

Not only were there many more actual online interactions recorded on the microblog when compared to the discussion board entries of the benchmarking unit, but the fact that over 1600 views were registered suggests that there was a general interest among students. It almost seemed that there was a momentum created to 'keep up-to-date' with the events unfolding online. This data alone may be significant in explaining different student behaviours, even if the majority of students may be 'lurking' at present, rather than actively communicating and contributing to the information exchange. This student interest and social presence (Dobozy, 2011a) may be important to assist them in changing their habitual behaviour in online learning situations. However, the question is: Will the NFE learning design be sufficient to act as a catalyst and important milestone in the cultural adjustment of teacher education pedagogy?

Usable data cited in Table 1 refers to peer-to-peer (P2P) communication on the microblog embedded in the LMS. Student-to-tutor (S2T) and tutor-to-student (T2S) communication on the microblog have been logged and included in the quantitative analysis. A further distinction has been made between assignment-related peer-to-peer communication (AR-P2P) and other (assignment unrelated) peer-to-peer communication (O-P2P). Only AR-P2P has been included in the detailed qualitative analysis, but all entries have been included in the quantitative analysis (see Tables 1 & 2). As a number of original postings (a total of 84) attracted at least one response (threaded comments), the actual number of microblog entries is 148.

Quantitative analysis

The quantitative analysis of the microblogging data outlined in Table 2 shows that approximately half of all entries were associated with assessment-related communication and half with other communication themes, such as tutorial reflections, suggestions for further resources, assessment-unrelated questions and comments etc. Of all categories, peer-to-peer communication contributed the most interactions (47%), followed by teacher-to-student interactions (38%). The least amount of interactions were attributed to student-to-teacher interactions (15%), which is not at all surprising, given that the unit is offered in face-to-face mode, with traditional weekly lectures and tutorials.

Table 1:
Microblog communication log

Total views of microblog	All original postings logged on the microblog (P2P/P2T/T2P)	All communication, including threaded comments posted on the microblog (P2P/S2T/T2S)
1697	84	148

Table 2:
Microblog communication categories: Assessment-related and other communication

Assessment-related Communication (AR)		Other Communication (O)		Total (actual) n=148	Total (%)
AR-P2P	31	O-P2P	38	69	47
AR-T2S	26	O-T2S	30	56	38
AR-S2T	16	O-S2T	7	23	15
Total (AR)	73	Total (O)	75	148	100

Next, all assessment-related peer-to-peer (AR-P2P), tutor-to-student (AR-T2S) and student-to-tutor (AR-S2T) communications via the microblogging platform enabled within the unit LMS, were analysed. Table 3 shows the ordering of the interactions according to (a) process-oriented or (b) content-oriented communication.

Table 3:
Assessment-related microblog communication categories: process-oriented and content-oriented interactions

Assessment-related Communication (AR)		Process-oriented interaction		Content-oriented interaction	
AR-P2P	31	22	71%	9	29%
AR-T2S	26	21	81%	5	19%
AR-S2T	16	13	81%	3	19%
Total (AR)	73	56	77%	17	23%

The fine-grained quantitative analysis of the assessment-related communication made apparent that it was at times difficult to group the questions/responses into 'content' and 'process' related entries. A decision was made that if the question related to the development of the product (the webquest), even if it could be placed under 'process' (i.e. *"Does the inquiry question need to include a specific component"*), it would be counted as content-related. However a question, such as *"How many references need to be included"*, was counted as a process-related entry. The microblog interaction pattern for assessment-related questions shows that over 70% of all communication was process related and only a small number of the investigated interactions were concerned with the actual content.

Qualitative analysis

The process oriented questions posted by students were exclusively concerned with issues that required simple responses, such as problems with the IT infrastructure or compliance issues. Hence, following Bennet and Bennet's (2008) distinction between 'surface', 'shallow' and 'deep' learning approaches, they were considered low-level questions, not demanding deep thinking or debate (see also Dobozy, 2011b). The following examples of process-related questions illustrate this point:

P2P Question: *Hi all, how do we include the alpha and beta testing in our assignment if we are submitting a CD?*

P2P Response: *Hi (student), I have simply scanned them and attached them at then end.*

S2T Question: *Hi, when I download the assignment 2 rubric from BB it goes all muddled and is unreadable. (Tutor) can you upload it as a pdf document?*

P2P Response: *I also find the marking rubric comes out muddled. My computer is fine with pdfs.*

P2P Response: *I'm using a Macbook, running Mac OS X 10.5 and using Microsoft Word for Mac 2004 and have the same problem.*

P2P Response: *(Student), if you go to MS downloads website and install the Office converter then all docs will be compatible across versions – saving lots of stess! (Just google Office converter) – just thought it's worth mentioning ☺*

S2T Question: *Hi (tutor), how many references are you expecting us to use in the teacher's page [of the webquest]?*

T2S Response: *Hi (student), I know you do not expect an exact number from me ☺. I do expect you to reference the main unit text, the current policy document [from the state education department] and preferably some other work (journal article, book chapter etc) discussion learning theory/practice. Hope this helps. (tutor)*

S2T Response: *Hi (tutor), all understood. (student)*

P2P Question: *Anyone else having trouble uploading the assignment to blackboard?*

P2P Response: *It worked for me but it took me an hour of trying.*

S2P Question: *Hi (tutor), just wondering where we should submit the CD for the webquest tomorrow.*

T2S Response: *Hi (student), please place it in the assignment box located in building xx at the reception.*

In contrast, although only a few content-related questions and comments were posted, they often attracted multiple responses and, demanding deep processing and personal judgment, they also exemplified the range of views, such as, for example the discussion about the usefulness of 'Wikipedia' as a resource for primary school children. The following extracts of content-related discussions is illustrative of deep processing and higher order thinking, which is, so it is argued here, what makes NFE and P2P interaction particularly valuable for learning.

P2P Entry: *Hi all, I was looking at the webquest.org site and found a webquest for teachers that asks you to identify the good and the bad webquests … so instead of trawling through a heap of webquests to grow familiar with them, check out the below site and complete the webquest yourself. I was impressed with the concept of it! http://webquest.sdsu.edu/webquestwebquest-sm.html. Cheers. (student)*

P2P Question: *Hi everyone, I'm hoping someone can help me with my question about developing inquiry questions: Does every inquiry question need to have a history component in the question? Thanks. (student)*

P2P Response: *"Why do we eat so much red meat?", is our inquiry-question. (student)*

P2P Response: *(student), not all questions need to have a history link. It is important that the question is open-ended (meaning that there is room for research, analysis, interpretation and personal judgment). Enjoy ☺ (student)*

P2P Response: *Got it! Thanks for the comments. (student)*

P2P Question: *Hi all, what are people's thoughts on using Wikipedia as a resource for our webquest? Personally, for our topic, the page is brilliant. There seems to be an unwritten rule that it would not be wise to include it, but it seems such a waste as it is very well written. Thoughts?*

P2P Response: *I agree that it is valuable if reviewed and cross checked first. Certainly, for our topic, we use it as one of a number of resources. We like it because it is advert free. We have found a lot of sites have inappropriate advertising for our target students (the problem with free websites). Hope this helps, but (the tutor) may give us a definite answer. (student)*

T2S Response: *Well, interesting discussion. If it is one of a number of resources and thoroughly researched, why not. I would, however, be a bit apprehensive, because you are, in fact, modelling information literacy to children, and the data on Wikipedia is often inaccurate. I suggest that you use screenshots that you crop (with appropriate source referencing) to eliminate ads. (tutor)*

S2T Response: *Hi (tutor), I understand what you are saying. We have two links to Wikipedia (out of 16 resources available to the students). We have reviewed and checked the information and found that a lot of the content on Wikipedia [pages] is actually a summary of other resource sites and we are using it as a background overview site, rather than a detailed resource site. I agree that it can be a dangerous site and probably not best to model as an idea.*

P2P Response: *Hi all, I will use the screen crops. (student)*

P2P Response: *This raises questions that I don't think many of us are able to answer … the CIA website, for instance, is packed full of facts,*

but should be accept it at face value … I think Wikipedia gets a 'bad press'. We will use it.

S2T Question: *Hi (tutor), just a question about the assignment. The anticipated outcomes, are you asking us what we want the children to learn from completing the webquest or are these outcomes for us [pertaining to our learning]?*

T2S Response: *Thanks for the question, I will respond to it in detail in the next lecture. (tutor)*

S2T Question*:* *Hi (tutor), I know I am supposed to go through my reference group first and I have done that and the answers received have been conflicting. In the [individual webquest sections] I have put …[specific information] … . Is this correct?*

T2S Response: *Hi (student), thanks for your detailed draft. I do not give specific feedback on drafts, but we will be able to discuss your question in the next assignment workshop. (tutor)*

S2T Question*:* *Hi (tutor), I am slightly confused about the project outcomes and goals on the marking rubric and how to relate it to the template. Can you please explain it again to us?*

T2S Response: *Thanks (student) for your question. I'm sure you are not alone. Please bring your specific questions to the assignment workshop and we will be able to look at it in detail. (tutor)*

P2P Question: *Hi, I'm attaching [extracts from] my webquest and would like some feedback … I'm open to any ideas. Thanks. (student)*

P2P Response: *Hi (student), I think each of the sections needs more work. I have found the (worked example) and marking rubric really helpful to make sure the intro, task and process pages were correct. If you weren't at the lecture, I suggest you download the podcast. Good luck. (student)*

T2S Response: *Thanks (student), that's great feedback and it's wonderful to see you share your ideas freely. (tutor)*

Less than 20% of content and process related questions were posed to tutors. What is noteworthy is that questions posted to tutors were actually answered by students and that many questions posted by students to students attracted responses from tutors. It is significant that this analysis also highlighted how often the tutors felt obliged to

contribute to the discussion and offer answers. Maybe as students and tutors become more familiar and comfortable with NFE, tutors may be able to change their pedagogical strategy. Instead of providing an instant response, they may let students take increased responsibility for this task. Surprisingly, the opposite was also observed. Whereas a question was directed to a tutor, a student felt sufficiently confident to offer a response, rendering the tutor's involvement almost obsolete.

Is it possible to encourage 'in-situ' peer-to-peer learning through NFE learning design?

In response to the first research question: *Is it possible to encourage 'in-situ' peer-to-peer learning through NFE learning design*, the findings of this study suggest that it is possible. The results showed that if students were not provided with teacher-centric step-by-step instructions of how to work through their project assignment, but instead were required to find their own ways around structuring their work, they were inclined to resort to the use of NFE provisions. In this instance the unit's microblogging site embedded in the LMS was used as a proxy for the NFE investigation. There was much activity recorded on the microblogging site (84 entries and over 1600 views). Of particular interest to this study were the assignment-related interactions between students. The analysis of the data has established that many process-related questions were asked, illustrating perhaps the strategic learning position many students take, which has been referred to by Bennet and Bennet (2008) as 'shallow' or 'surface' learning engagement. Nevertheless, the content-related entries were able to illustrate moments of deep engagement with the content and with each other as a number of students exchanged information and debated the value of particular positions taken (i.e. Wikipedia use as a webquest resource for primary school children). Bennet and Bennet (2008) would classify these moments of NFE as 'deep' learning engagement.

How influential is the present learning design in changing teacher education students' perception and appreciation of NFE and peer-to-peer learning?

A post-facto analysis of the student evaluation of teaching data was conducted to provide explanations to the second research question. What is striking was some students' negative emotion that the current experimental learning design of the unit invoked. There was much anxiety expressed by students during the course of the unit, but most prominently on the unit evaluation form, at the end of the unit. The overall negative evaluation that the unit attracted from students can be exemplified by the following extract:

> *The assignment guidelines [were] so vague and disjointed; it is nearly impossible for someone like me, who requires explicit instruction, to get the point. … [this] goes to show there was a fundamental flaw in the design of the assignment. …. I am still extremely frustrated by this subject.* (Student, 2010)

Given increased understandings of student socialisation and expectancy to receive heavily scaffolded direction and teacher support, emotive student responses and negative unit evaluation of inquiry-based learning design is not entirely unexpected. As Shulman (2005) and more recently (Dobozy, 2011b) note, needing to resort to

self-initiative often leads to anxiety and dissatisfaction among a great number of teacher education students. Shulman's (2005) observation is pertinent here. He contends that NFE environments, which are not teacher-centric, provide "a sense of unpredictability [and] … anxiety. And for some, anxiety morphs into terror" (Shulman, 2005, p. 11). Following Shulman (2005), I content that this study may be able to assist in understanding the importance of investigating more closely the interplay between cognition and affect in resocialisation processes. Learning designs that involve the construction of NFE spaces, which allow for the development of spontaneous P2P communication aim to work towards cultural change in higher education. The premise is that NFE provisions may enhance not only P2P communication, but also the appreciation of this student-centric, flexible learning design, enabling the development of metacognition, deep learning engagement, reflexivity and academic performance.

Conclusion

This paper reported an investigation of habitual action in naturalistic learning contexts. A baseline or benchmark reading of 'habitual behaviour' of a particular student cohort was taken as comparison data from two different core units in which the same student cohort was enrolled. The distinguishing factor between the two units was the learning design, whereas the learning design of the experimental unit (case study reported here) was inquiry-based, the comparison unit adhered to a traditional teacher-centric learning design, despite the similar rhetoric used in the respective unit handbooks. The detailed investigation traced 233 student teachers' contributions to a unit's microblogging space. The microblogging facility was easily accessible by students through the university learning management system (LMS). Communications on the microblog were investigated to ascertain if students would resort to NFE and peer-support in a student-centric learning environment. This investigation was perceived to be of importance, because much teacher education in Australia is still delivered using traditional teacher-centric pedagogy, despite the changing rhetoric of student research, group-based learning, and peer-to-peer collaboration. An important finding of this research was that the teacher education students in this study did take up the offer of peer-assisted learning design, out of necessity rather than choice. However, the negative satisfaction rating the unit received suggests that these students to not yet display sufficiently-developed understandings of NFE learning design, which promotes deep learning. It may well be that in the future, teacher education will need to pay more attention to educational psychology research and provide a carefully balanced mix of explicit learning of student-centric learning design as content knowledge and immersive learning environments in which student-centric learning design is implemented.

This investigation contributes to educational research which provides evidence that the mere fact that e-learning and NFE provisions are made available does not lead to the uptake of more student-centric learning. These important learning spaces for P2P interactions will continue to be ignored by students, even if they are keen social networkers outside of formal education, if there is no perceived incentive or benefit to increased peer collaboration. A Bourdieuian conceptualisation of the barriers to greater uptake of NFE by teacher education students (and others) has strong affinities with

ideas about enculturation and learning design (Danziel, 2007) that are becoming increasingly influential. The findings of this investigation suggest that it is unlikely that teacher educators and their students will change their habitual practices unless they perceive the value-added nature of augmenting their current pedagogical practices, infusing the formal teacher-centric style of teaching and learning with authentic student inquiry and other forms of nonformal teaching, such as online peer-to-peer collaboration. However, given the global recognition of the need to educate students to become lifelong learners, self-directed and motivated to seek out opportunities for P2P support, the conclusion is reached that it may be necessary to conduct more research on the importance of NFE to better understand the advantages that NFE offers in teacher education and subsequently in school education.

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