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Employing interdisciplinary collaborations to redefine academic practices in a university Nursing program

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This paper documents how interdisciplinary collaborations between academic staff helped redefine academic practices in the first year undergraduate nursing program conducted at the University of Southern Queensland. The interdisciplinary collaborations constituted a response to the various contexts currently impacting the higher education sector in Australia. These contexts include changes in pedagogy, curriculum, assessment, academic identity, technology, research-informed learning, student and stakeholder expectations as well as the challenges of managing an increasingly diverse student body. The interdisciplinary boundaries were crossed so that academic practices were integrated to assist student nurses to transfer the academic, literacy, numeracy, e-learning and information technology attributes they need if they are to succeed at university and in the nursing profession. This research study used a continuous evaluative methodology to test the effectiveness of these academic practices from three perspectives: the staff, student and institutional perspectives. Overall, the evidence suggests that these interdisciplinary, embedded, situated and scaffolded academic practices enhance students' capabilities to make successful transitions both to the university and into the nursing profession.

Keywords: interdisciplinary practices, nursing e-portfolios, embedding key literacies

Introduction

Background

The Department of Nursing and Midwifery at the University of Southern Queensland (USQ) reviewed and consequently rewrote the first year Bachelor of Nursing curriculum in 2006 to create a modern, interdisciplinary and flexible nursing education program. The program needed to respond to the challenges impacting higher education (HE). These included shifts to a student focused curriculum (Kirkpatrick & Mulligan, 2002); changing assessment needs, principally the incorporation of a professional e-portfolio (Lawrence, Loch & Galligan, 2008); and academic identity, for example, stemming from the increasing momentum of developing graduate and work-based qualities and skills (Trigwell & Shale, 2004). Additional impacts were those generated by technology, in this instance, helping students master and demonstrate the rapidly evolving range of technological literacies demanded by both HE and the profession; research-informed learning, especially important for nursing students who need to manage changing professional development needs; and student and other stakeholder

expectations, including professional demands for effective interpersonal and teamwork capacities and the political pressures regarding nursing accountability and scope of practice (Lawrence *et al.*, 2008). A final impetus for these curriculum design decisions was the very diverse nursing student body at USQ. This cohort includes mature age students as well as school leavers, international and domestic students and disadvantaged groups such as those from low socioeconomic, Indigenous and rural and isolated backgrounds. It was considered that the interdisciplinary and collaborative approaches would effectively meet these diverse students' needs, facilitate their transition to university and provide them with the skills they need to progress at university and in nursing.

The academic practices underpinning the new program included a holistic approach, a focus on the student learning journey, the incorporation of embedded learning practices and an emphasis on technological engagement and e-learning. This paper will specifically focus on how these academic practices were generated, delivered and evaluated in the two first semester, first year courses: Building Professional Nursing Attributes A (CMS), and Building Professional Nursing Attributes B (MAT). CMS aims to develop students' academic and information literacies and learning, research and communication (interpersonal and teamwork) skills as well as assisting them to begin their professional e-portfolios. MAT strives to develop students' numeracy and computing skills directly linked to their degree and their later professional practice. The courses were developed in interdisciplinary collaborations between the Nursing Department, the Faculty of Sciences (mathematics and computing skills), the Faculty of Arts (academic literacy and communication skills), the Learning and Teaching Support Unit (pedagogical reinforcement and learning and teaching guidance), and the library (information literacy).

Theoretical perspectives underpinning the new academic practices

A number of theoretical perspectives contribute to the new academic practices. They include the literatures related to interdisciplinary curriculum, critical literacy and numeracy and learning improvement models.

Interdisciplinary curriculum describes an integration of multiple disciplines to respond to modern working patterns, which increasingly call for multidisciplinary teamwork, and challenges arising from the 21st century demand for interdisciplinary solutions (Woods, 2007). The first year nursing program uses this multidiscipline approach to investigate an area of common concern (Davis & Devlin, 2007). The purpose of this approach is both to facilitate first year students' success and to assist in preparing students to manage the changing worlds of HE, employment and the requirements of working in multidisciplinary teams.

Critical literacy also underpins the new academic practices (Cope & Kalantzis, 2000; Fairclough, 1995; Kirkpatrick & Mulligan, 2002). Employing a critical literacy approach, Lawrence (2005) conceptualises a 'deficit-discourse shift'. This shift visualises the university as a culture made up of many sub-cultures, each with its own discourse or literacy and recasts the students' transition as a process of gaining familiarity with and becoming competent with these new literacies. New students, for example, need to rapidly, and simultaneously, become familiar with and engage with faculty, discipline and subject discourses, academic, library, research, information, administrative and technological literacies as well as new teaching and learning styles and a plethora of unfamiliar cultural practices. The shift underpins first year curriculum design decisions, particularly those related to embedding and scaffolding (Pea, 2004) key academic, communication and computing literacies and numeracies.

Critical numeracy also provides insights. Using this approach, students can go deeper into the mathematical ideas and deeper into the contexts (University of Tasmania, 2009). The numeracy component of curriculum design is based on material developed by one of the authors and her colleagues over 14 years (Galligan, 2001; Galligan & Pigozzo, 2002; Galligan & Taylor, 2004) using situated cognition, and a microgenetic theory of human development (Valsiner, 1997) to trace an individual's numeracy journey.

Keimig's (1983) model of learning improvements suggests that generalised approaches to remedial and tutorial assistance are less likely to be effective than those targeted at specific aspects of learning within academic courses where the need for knowledge or skill becomes apparent (p. 21). Keimig also proposed hierarchical levels of support to provide for the total learning requirements of students including students' needs and attitudes. These incorporated a comprehensive list of variables – goals, objectives and rationale; instructional methods and content; institutional policies and standards; professional and paraprofessional staff and roles; and evaluation of learning improvement. These insights also underlie the first year nursing approach.

The paper first describes the changes in academic practices in terms of curriculum design, learning management systems and electronic assessment. Secondly, it outlines the program development and evaluation methodology. Thirdly, the paper summarises the three perspectives – staff, student and institutional – used to assess the effectiveness of the program. Finally the lessons learnt, improvements made and future research directions are reviewed.

Changed academic practices

Curriculum design

The theoretical perspectives underpinned the design decisions made by the team. Intersections between all first semester courses contributed to the program's holistic approach and were reinforced by the CMS e-portfolio assignment. Joint assignments for CMS and MAT are included, for example one of these assignments requires a review of an article (marked in CMS), and a graph and formatting (marked in MAT). Assignments in CMS and MAT comprise drafts for assignments in other nursing courses. Lawrence *et al.* (2008) outlines these initiatives in more detail. The interdisciplinary perspective reinforced the need to embed, scaffold and situate the critical attributes students need to make a successful transition to university and to the profession. For example referencing skills are taught (embedded) and demonstrated in formative assessment (scaffolded) in CMS classes and are then integrated and mastered in other nursing assignments.

Learning management systems and electronic assessment

Concurrent with the interdisciplinary focus was integration with USQ's learning management systems (LMS) to generate a flexible e-learning environment. The material is developed and made available through a multi-modal in-house content creation system (that is, print, CD and available on the web through the open source Moodle Learning Management System). Assessment and other resources are made available online through the Moodle site which is shared by the disciplines involved. This includes multimedia material, electronic submission and interactive discussion forums. Other features include the marking and integration of assessments. All assessment items, including formative assessment, are submitted and marked electronically. Some assessments have students electronically peer review (Lawrence *et al.*, 2008) using a completely automated program developed in the Department of Mathematics and Computing (de Raadt *et al.*, 2005). The e-portfolio uses the Mahara e-portfolio platform.

Methodology

While the theoretical perspectives underpinned the key principles and academic practices of program design, the team also took care to test the efficacy of these decisions in a longitudinal research study.

The methodology included continuous evaluative processes which were applied throughout the design, delivery and evaluation of the program. The methodology used a standard method of evaluation and program development (Taylor & Galligan, 2002, developed from Guba & Stufflebeam, 1970; see Figure 1) and includes both quantitative and qualitative data collection techniques.

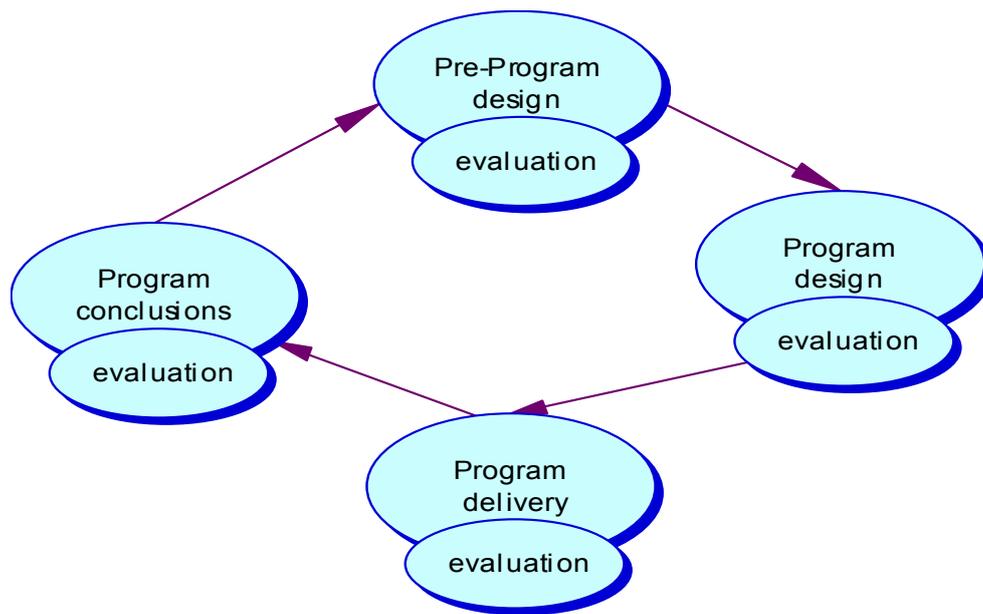


Figure 1: Model of program development

At each design stage, both formative and summative evaluation strategies are conducted (see Table 1). To date, three cycles have been undertaken, from 2006 to 2009. The first two cycles (2006–2008) have been completed, with the third year cohort (2009) the first to complete the program. The model incorporates evaluation priorities in each cycle.

Within the study, a phenomenological approach (Jeffers, 1998) is taken to understand the human lived through experience of students as they become more academically prepared. Data collection includes questions in surveys, and individual interviews that collect students' past experiences; their present feelings and experiences and how these present feelings and experiences are transformed (Items 6–12).

In each cycle, three interdisciplinary perspectives were investigated: staff, student and institutional perspectives (these are also documented in Table 1).

Table 1: Relationships between the evaluation strategies and stages in the program design

Item	Evaluation strategy	Pre-program design stage	Program design stage	Program delivery stage	Program conclusion stage
The staff perspective					
1	Needs assessment	✓	✓		✓
2	Weekly then monthly discussions with first year nursing lecturers (and as needed)	✓	✓	✓	✓
3	Debrief with first year nursing lecturers				✓
4	Peer review through presentations in and beyond the university and through publication of peer reviewed articles				✓
5	Interviews with course designers				✓
The student perspective					
6	Use of feedback from previous student surveys of courses including those that were replaced by current courses	✓	✓		✓
7	Reflections in assignments			✓	✓
8	Student surveys			✓	✓
9	Official Student Evaluations of Teaching				✓
10	Online discussion groups			✓	✓
11	Second and third year student cohort surveys				✓
12	One-on-one sessions with students to investigate student learning		✓	✓	
The institutional perspective					
13	E-portfolio assignments			✓	✓
1	Needs assessment	✓	✓		✓
11	Second and third year student cohort surveys				✓

Data collection

Three perspectives are used to investigate academic practices incorporated in the program: the staff perspective, encompassing the team's interdisciplinary work in design and delivery; the student perspective, involving the learners' interdisciplinary educational experiences; and the institutional perspective, embracing the shifts between students' pre-university, university and nursing settings. This evaluation methodology is reiterated during each offering of the program.

The staff perspective

In the initial pre-program design stage, the design team took advantage of their experiences in previous development of curricula for nursing students. A numeracy audit completed in 2001 (reported in Galligan & Taylor, 2005) and two research studies, analysing a previously offered communication course (Lawrence, 2006), and a numeracy course (Galligan & Pigozzo, 2002), also provided a basis on which to build in the new approach (Item 1).

In each program stage, as well as in the reiteration of these stages, regular meetings are held to develop, review, moderate, and fine-tune the academic practices (Item 2). Ongoing feedback is also obtained from the team during the design period, as well as from the program coordinator and the leaders of the first year nursing courses during delivery and evaluation stages.

Debriefing meetings with nursing lecturers are conducted throughout the teaching cycle and in the debriefing and pre-planning stages for the next course cycle (Item 3). Peer review is also undertaken (Item 4). To date, this has included feedback obtained during a USQ presentation held during a Learning and Teaching Best Practice Showcase Week (2008) and two peer reviewed articles (Galligan, Loch & Lawrence, 2008; and Lawrence, Loch & Galligan, 2008). In April 2009, as part of the continuing research study, course leaders were also interviewed (Item 5).

The student perspective

In the pre-program stage, use was made of the extensive amount of feedback that had been collected from students in a number of research studies (Item 6). For example, prior to the first offering, evaluations on numeracy workshops were undertaken with qualitative research on nursing numeracy providing valuable insights into nursing needs (Galligan & Pigozzo, 2002; Galligan, 2002). The student perspective also involves investigating the learners' educational experiences. During the delivery stage, continuous evaluation is acquired from structured reflections in assignments including e-portfolios (Item 7), unsolicited feedback presented in emails, forum discussions (Item 10) and intensive one-on-one sessions (Item 12). Two independent formal student evaluations are also conducted at the conclusion of each cycle: one designed by the team to address program specific issues (Item 8, n = 94 in 2008); and the other, the standard university course quality survey (Item 9). In 2009, second and third year students were surveyed to investigate the impact of the academic practices on the three years of their studies and to ascertain any lasting impacts on their future disciplinary careers (Item 11, n = 66). For example, one student wrote:

I think that I reflect on my actions but not to the extent that was required for the e-portfolio assignment. It really allowed me to see where I can improve and where my greatest strengths are in this I think will be of interest to employers.

The institutional perspective

This perspective investigates the shifts students need to demonstrate as they learn to move between pre-university contexts, academic and nursing settings. Continuous feedback is obtained, principally from the e-portfolio assignment (Item 13) and the survey conducted with the second and third year student cohort (2009) (Item 11). In the portfolio students are asked to reflect about the development of their learning and academic skills as they bridge the divide between their pre-university school and employment (both nursing and casual work) contexts (many are mature-age students) and their new university and nursing contexts. Included in the e-portfolio, for example, is an online personality, learning approach and learning style questionnaire that generates feedback on which students are asked to reflect. In the portfolio, students are asked to reflect about and develop evidence in relation to USQ's graduate qualities and nursing's disciplinary competencies.

Findings and discussion

The continuous evaluative processes at the heart of the methodology reveal both positive and negative findings stemming from each of the three perspectives investigated.

The staff perspective

Interviews and discussions with 15 staff produced positive comments about the interdisciplinary impact in empowering students to move competently into the academic setting. In these ongoing meetings all staff involved were positive and contributed constructive about ways the interdisciplinary collaborations. For example, an experienced first year lecturer from the Nursing Department had made the observation that “[students] show definite improvement and better understanding”. Staff testified about the differences between the students who have taken the CMS/MAT courses and those who haven’t, as well as about the difficulties the latter have and the necessity for intervention. For instance, a Semester 2 Medical Calculations lecturer maintained that for students without CMS/MAT “we had to literally spend an extra 20 minutes per class going over the working out line by line”.

Staff also found the interdisciplinary collaboration useful:

It was one of the contributing factors ... [that] helped us to have a curriculum that was more supportive and developing of skills in the first year (experienced first year Nursing lecturer).

... it certainly gave focus to the program, because part of the goal was to target the first year experience and to deal with retention. The strengthening of the teaching teams would have been a benefit and having that level of communication. The students are then able to talk about different courses across that semester and know that they are linked together (Nursing lecturer involved in course pre-design).

Collaboration and dissemination between all the stakeholders are vital if the academic practices are to be effective. Being responsive to feedback is pivotal. In 2009, for example, problems arose with the changeover to new USQ-wide technological infrastructure, the introduction of the Mahara e-portfolio software, over-assessment in the e-portfolio and a lack of focus on referencing and academic practices (usually a core component of CMS). A range of meetings were held and changes made which will be assessed in 2010.

A main aim is to empower students to learn and apply new skills in their other courses. It was observed in staff interviews that in the same year there does seem to be transfer. For example, the Semester 2 Medical Calculations lecturer commented those who had done MAT “transferred much faster than the others”. However, taking skills into second year courses needs some prompting.

The student perspective

This perspective focuses on learners’ educational experiences. Evidence from student evaluations, reflections and interviews suggests three main themes: increased mastery of HE discourses, success in linking academic skills to other courses and student growth in understanding and confidence. There are also general comments about the e-learning experience.

Increased mastery of HE discourses

Changes are made in each iteration as a result of feedback gained. The majority of students perceived that the courses helped them to become familiar with university expectations. For example, from the 2008 end-of-semester student survey (n = 94), 70% of students thought the course “has helped me build up confidence in my communication skills”; 83% thought “assignments were relevant for my future use of communication”; 72% thought “this course has helped me build up confidence in my maths skills” and 64% agreed that “this course has helped me build up confidence around computers”. In retrospect, students who had completed these courses in 2007 and 2008 found the skills they had learned were invaluable throughout their studies. When asked, “One of the objectives of these two first year courses was to help you master the skills you need to succeed at university. How satisfied are you that the courses helped you to become competent and confident using the following skills?”, over 90% of the students were ‘satisfied’ or ‘very satisfied’ that the maths, computing, e-learning, writing, referencing, communication and learning how to succeed skills helped them. A comment from one mature aged student summarises many of the sentiments from students starting out at university: “... [I moved from] being terrified, not knowing anyone or how uni works, I found [the course] extremely helpful”.

Success in linking academic skills to other courses

The second theme arose from comments linking skills learned in the CMS/ MAT to other courses. To a question on the 2007 formal survey: “I have learned to make connections between this subject and others”, 96% of students agreed with the statement. These sorts of comments were typical (2009 survey): “this course prepared us for other courses and gave us the skills such as referencing and research that we need all through university; Everything was connected and this puts less strain on us ... All of the subjects are working together makes it more efficient for students”.

Student growth in understanding and confidence

Examples of this theme emerged in student responses:

I have a better understanding of how to layout assignments, my computer knowledge has improved immensely. I feel more confident now when it comes to the basic maths equations required for my nursing course (2008 formal student survey).

Overall I find this course to be incredibly important to my growth at uni[;] I don't know what I would have done without it (2008 formal student survey).

Specific questions were asked about the e-learning experience as this was a major innovation. The response was very positive (see Lawrence *et al.*, 2008). For example, in terms of electronic submission: “submitting the assignments for MAT and CMS was quick and easy”. In terms of the electronic peer review: “these were a way to reassess your own work and acknowledge where you may have gone wrong. Giving helpful and positive remarks to others students also helped to give them feedback for future assignments” (2008 survey).

The institutional perspective

This perspective is viewed through two lenses: students' transitions from their pre-university backgrounds to the university context; and students' transitions from the academic to their future professional settings. That the interdisciplinary practices assisted students to manage a more comfortable transition was clearly demonstrated. For example, the 2008 end of semester

survey included many comments about the benefit of the courses in assisting students to move competently into the university setting:

I felt that CMS and MAT 1008 were both very helpful in introducing uni life. I would have struggled a lot more if it had not been for these classes.

It was nice experience for me to study in a big university. In the starting I was bit confused but soon I was fine communication skills, analytical skills which I learnt through CMS/ MAT 1008 were appreciated.

Alternatively students who didn't complete CMS/MAT did not seem to be as well equipped to make the shift between study years. As the Second Year Medical Calculations lecturer observed: "About 50 students [who did not study CMS/MAT] were lost and [they had] no clue as to what was happening". This was also evidenced when moving from undergraduate to post graduate study:

Computing skills – it must help a lot. ... I have people who would have not gone through [MAT1008] doing the Master of Midwifery and they seem to have trouble (Master of Midwifery Program Coordinator).

The benefits of the academic practices can be seen by responses in the 2009 survey of second and third year students. To the question "How have the skills learnt in CMS/MAT1008 helped you to succeed in clinical placement situations?" replies included:

The biggest help was the ability to effectively write reflection pieces during and after a clinical placement.

Although I have only been on one clinical placement I found that I had the confidence to ask questions and approach others confidently and I felt prepared.

Students' evidence confirms the capacity of the e-portfolio to help students organise themselves for employment. In response to a question: "Do you think some of the objectives in CMS/MAT will help you obtain work as an RN [Registered Nurse]?", students' replies included:

I have been spending time on my e-portfolio – increasing its content and I view it as being an excellent platform for displaying achievements and communication abilities.

Room for improvement and future research directions

While this paper paints a positive picture of a successful implementation of an innovative approach, there has also been ongoing constructive feedback from staff and students suggesting improvements. Two major issues emerged: joint assignments and the increased diversity of student cohort. While care has been taken to discuss joint assessment items with the appropriate course leaders, assignment guidelines have been confusing to some students who commented that they had to redo an assignment so it fitted the criteria of each course. As this is one of the interdisciplinary transition skills, care was taken through appropriate scaffolding to make these processes more explicit and transparent for students in the following offer.

The approach taken to address diversity is, at its heart, linked to the critical literacy and numeracy approach of embedding and scaffolding. In 2008 we implemented two strategies. First, student mentors were introduced to support online queries and discussions. These mentors acted as role models for other students and had a cascading impact with other students also supporting their peers. Second, flexibility was introduced into the MAT course by giving students an option to complete the work in half the time. This was positively received and was continued in 2009. A typical comment from students surveyed was: "I am glad I did the fast track and to have that option is fantastic". Some students thought they could have followed the fast track, but chose to stay in the normal track as a student commented: "I didn't want to get overconfident and was happy to mosey along at a steady pace. I viewed this course as getting all students up to the same benchmark to go forward for the rest of the course" (student survey 2008).

A related issue of concern is students' understanding of the importance of the online environment as a key to accessing all material and communication in their degree. This has become an issue of particular importance in 2009 with a significant rise in student numbers and the forums becoming increasingly important in assisting students efficiently. There also needs to be ongoing, yearly communication with other staff to ensure the CMS/MAT courses are delivering skills as transparently as possible.

Future directions include the continuation of the longitudinal study of the impact of this interdisciplinary approach on students. For instance, feedback from students who took the first offer of MAT/CMS in 2007 could be sought now that they have completed their degree, with a follow up a year later to investigate the effect on their professional careers.

Conclusion

This paper describes the positive contributions made by the curriculum team's interdisciplinary collaboration. The interdisciplinary approach has produced a more collegial and holistic perspective, including in relation to interdisciplinary curriculum design, e-learning and delivery. Findings also illustrate that the collaborative approach assists the effectiveness of the CMS/MAT team in achieving their goals. The positive impact on learners' educational experiences extends to the e-tools used in assessment, and the integration of assessments assists students in their other courses and stimulates them to think more holistically. While there are lessons to be learned and improvements to be made, the feedback suggests that students are supportive of the courses and their interrelationships.

The interdisciplinary practices and technologies presented and assessed in this paper describe how interdisciplinary collaborations, if managed properly, can lead to successful staff, student and institutional outcomes.

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