A Common First Year in a Large Multi-disciplinary
Faculty of Health Sciences

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Abstract: Higher Education approaches to professional training in the health sector have moved from undergraduate to postgraduate in recent years. In Australia the health system has evolved, giving more responsibility to allied health professionals. In addition the cost of providing clinical training for students has steadily increased as has the need for qualified professionals. In response to these imperatives the Faculty of Health Sciences at La Trobe University has undertaken significant curriculum review and restructure. This has resulted in the development of a model incorporating a common first year across ten health disciplines delivered to approximately 1500 students, across five campuses. Enquiry based learning was chosen as the learning approach with the aim of establishing a collaborative learning environment to enable greater student interaction, and to engage them in an interprofessional learning experience. The revised first year curriculum was designed and developed over two years, and implemented in March 2009. Surveys of students and staff were conducted during the first year as a preliminary indicator of the experience of this altered mode of learning and teaching. This paper outlines the theoretical base for the curriculum design, the development process and provides data on initial staff and student responses.

Keywords: Curriculum Change, Enquiry-based Learning, Constructivist, Interprofessional Practice Multidisciplinary

Introduction

I N AUSTRALIA, CHANGING demographics, including an increasingly ageing population and growth in chronic and complex conditions, is leading to increasing demand for health professionals. Unlike their predecessors, these professionals are expected to manage more complex problems and work in a multidisciplinary team structure. The Faculty of Health Sciences (FHS) at La Trobe University is attempting to meet these challenges through the development of a revised curriculum. This new curriculum rationalises first year programs offered by individual disciplines into a common first year and increases academic standards to Masters level.

The Common First Year (CFY), with seven semester-long subjects and one elective, is delivered to approximately 1500 students. The university is a multi-campus university and the Faculty offers these programs at the main metropolitan campus and at each of its four regional campuses. Enquiry-based learning (EBL)(CEEBL, 2005; Kahn & O'Rourke, 2005) is used as an approach to teaching and learning that actively engages the students in learning activities and provides a comparable experience for students on all campuses (McAlpine,

COMMON GROUND

Pannan & Fitzmaurice, 2008). An important aim of the CFY is to provide an interprofessional learning experience. The CFY was implemented in March 2009. In this paper the educational rationale for the CFY and the design approach is considered. Feedback provided by students and staff during the implementation of the new curriculum is discussed and further developments in curriculum change and recommendations to improve the implementation process are considered.

Context for Curriculum Change

La Trobe University's Faculty of Health Sciences, a major provider of health and human service professional training in Australia, identified a number of key issues impacting on the delivery of its academic programs.

The first of these was the changing health environment in Australia. Recent reports commissioned by the Australian Government have identified the need for alternative models of health care and service delivery (Productivity Commission, 2005; National Health and Hospitals Reform Commission, 2008; National Health Workforce Taskforce, 2009). These reports advocate a shift of responsibility from medical professionals to allied health professionals and an increase in multidisciplinary team care. The reports also note that increased training time is resulting in delays in entry to the workforce, compounding labour supply issues. Furthermore, a lack of sufficient infrastructure and planning to support clinical and professional training limits the capacity of training providers to graduate more professionals.

The National Health and Hospitals Reform Commission (2008), in its interim recommendations, identified the need for a competency-based framework for health professions with a flexible, multidisciplinary approach to the education and training of all health professionals. Presumably, this would allow students who achieve required levels of competence to accelerate their entry to the workforce. However, the pragmatics of this remains uncertain given the current requirements of many registration authorities for students to complete a set number of hours of clinical training in a system with limited capacity to meet this need. To this end, the Commission recommends a dedicated funding stream for clinical placements and the provision of clinical training infrastructure across all settings, including primary health services, both public and private, and other community settings.

Changes in the higher education sector in Europe and North America have also raised issues for Australian higher education providers. To remain competitive in a global education market, Australian universities have to ensure that educational models and pathways maintain parity with trends observed internationally. This relates primarily to the length of degrees and the trend toward postgraduate credentialing.

The Faculty of Health Sciences has responded to these challenges through a comprehensive review and restructure of all professional training degree programs. A Bachelor/Master combined degree structure incorporating a common first year provides the structure for embedding graduate capabilities and professional competencies. The Bachelors component integrates pre-clinical theory and practice and is completed at the university while the Masters program is undertaken in a clinical network which provides the necessary clinical practice environment.

The common first year provides efficiency in teaching as it consolidates duplication of teaching effort across ten disciplines. It provides the foundation skills to engage students in deep learning processes which in turn accelerate progression to Master level outcomes. In-

terprofessional learning is an important driver for the new first year curriculum and reflects the health sector's desire for graduates with multidisciplinary and interprofessional competence.

Learning and Teaching in Higher Education

Pressures for more graduates, enhanced student learning outcomes and greater efficiency in delivery of curriculum have created conflict in higher education environments. These changing demands necessitate a new way of thinking about teaching and learning, with a focus on creating more independent learners. Barr and Tagg (1995) characterised this as a shift from a teaching to a learning paradigm. They argue that from the perspective of the traditional teaching paradigm, teaching more students and achieving higher standards simply requires more teaching. From the learning paradigm perspective these outcomes require more learning. This requires different approaches to teaching, but not necessarily more of it. This paradigm shift has been a significant factor in current research and theory in learning and teaching. The twin aims of improving learning outcomes and reducing costs have been achieved in a range of large-scale first year subjects (Twigg, 2003). The key aspect is to focus on what the students need to learn and be able to do, and the most effective way to learn it. This focus can be applied to course and subject design to enhance learning (Biggs & Tang, 2007). From the perspective of the learning paradigm, the focus for academic staff is less on teaching and more on creating environments for learning so that students may work in cooperative, collaborative, and mutually supportive ways. Barr and Tagg (1995) argued that such an approach can increase outcomes without increasing costs.

The paradigm shift referred to by Barr and Tagg (1995) is reflective of a broader underlying change in research on issues relating to teaching, learning, and instructional support. In 1991, Jonassen pointed to a paradigm shift in instructional systems design (Jonassen, Cernuca & Ionas, 2007). He was referring to a change from a focus on direct instructional methods to a constructivist approach. Constructivism is seen as an underlying philosophy of learning that is focused on the way learners construct meaningful interpretations during the learning process. Knowledge, from this perspective, is not objective and independent of individual knowers and learners. Rather, it 'is embodied in experience, perceptions, imaginations, and mental and social constructions of humans' (Jonassen et al., 2007, p. 2).

Constructivist Approaches

The constructivist approach provides a conceptual underpinning for the shift from the teaching to the learning paradigm. In this approach, teaching is less about communicating knowledge and more about engaging learners in activities that lead to both learning and practical applications. Ideally, learners learn in practice allowing for a practical application of knowledge and skills. In a university environment, learners can be provided with a simulated form of an authentic task to provide the opportunity to relate theory to practice in an active and intentional way (Jonassen et al., 2007). Constructivism is the philosophy underlying many pedagogical models. One such model is problem based learning (PBL)(Biggs & Tang, 2007). In this model, students start with a practice-related problem, for which they need to learn the underlying theory and consider the available evidence so they can formulate a response. The students undertake this process of enquiry in collaboration with other students

under the guidance of a facilitator. The outcomes of the PBL activities are reflected through assessment.

Research evidence suggests a qualitative improvement in student learning using PBL when compared to more traditional learning approaches (Hmelo-Silver, 2004; Dochy, Segers, Van den Bossche & Gijbels, 2003). Traditional PBL models however, are prescriptive in their problem design, reducing the opportunity and flexibility for students to investigate topics that interest them (Palmer, 2003). The PBL approach may also be seen in a broader context of learning by enquiry. The Boyer Commission on Educating Undergraduates in the Research University (1998) recommended that students should have opportunities to:

- Learn by enquiry, rather than being receivers of knowledge transmission
- Learn through collaborative tasks, such as team projects and through critique of the spoken and written work of other students.

The Boyer commission also recommended that these processes of learning by enquiry begin in the first year of university and continue throughout the degree program (Boyer Commission, 1998).

Learning by Enquiry

Enquiry based learning (EBL) incorporates a range of learning models including the traditional PBL model, hybrid PBL/EBL formats that present students with a problem or issue for which they may work in small teams with any of a wide range of teaching/learning/support processes, and individual projects (Hmelo & Lin, 2000; Kahn & O'Rourke, 2005). The common element in these models is the emphasis on knowledge construction on the part of the student, and the provision of structured guidance to optimise student learning.

The characteristics of EBL are summarised by Kahn and O'Rourke (2005, p. 2) as:

- Engagement with a complex problem or scenario, that is sufficiently open-ended to allow a variety of responses or solutions
- Students direct the lines of enquiry and the methods employed
- The enquiry requires students to draw on existing knowledge and identify their required learning needs
- Tasks stimulate curiosity in the students, encouraging them to actively explore and seek out new evidence
- Responsibility falls to the student for analysing and presenting that evidence in appropriate ways and in support of their own response to the problem.

EBL is associated with the development of generic or employability skills such as teamwork, communication and problem-solving (Kahn & O'Rourke, 2005). Increasingly, universities are identifying these skills as a marketable set of graduate capabilities. These are among the graduate capabilities required by the changing health workforce. Employers have described the culture shock experienced by new graduates who are unprepared for 'the change from working competitively as an individual to working as a member of a cooperating team' (Bennett, Dunne, & Carré, 2000, p. 18). The problem appears to be that many students lack the 'soft' generic skills and are likely to be unaware of those they may have acquired.

Learning processes associated with EBL are designed to foster and provide opportunities for students to develop their social, communication, teamwork and problem-solving skills through the process of working in teams to resolve enquiries. This is one of the underlying educational reasons for these approaches. They are designed to produce a different type of graduate, better suited to the contemporary workplace.

Learning Design for the Common First Year

An EBL approach was chosen for the common first year. The EBL approach offered the flexibility required for the delivery of common first year subjects with large numbers of students on multiple campuses. A model was required that would enable teams of academic staff to design subjects that could operate effectively for such large enrolments and provide the students with an active and engaging learning experience.

The EBL subjects have the following characteristics:

- Student performance in the subject is defined through clearly stated learning outcomes.
- The subject has several (2-4) complex enquiries designed to engage students and encourage development of the knowledge and skills required to achieve the performance specified in the learning outcomes.
- Enquiries are presented to the students at the beginning of a segment of the subject and provide a focus for student learning over several weeks.
- The number of lectures presented is less than previously used in the subjects replaced, and facilitated workshops support learning by placing a strong emphasis on active participation in enquiries.
- Students work in multidisciplinary teams on their enquiries. A typical workshop group has five teams of 5-6 students. Workshops may run for one or two hours each week, and the work is guided by a 'Workshop Facilitator'.
- Each enquiry details the scenario and team task, the required presentation or submission, resource material and lecture topics. An enquiry guide maps out a process for the students, including what to do as a team in workshops and in individual follow up activities in preparation for the next workshop.
- Teams are usually assessed on the outcome of their enquiries through team assessment tasks. This is supplemented with individual assessment such as tests, exams, and individual assignments.
- Peer review of contribution to and participation in team assessment tasks may be used to moderate marks awarded to individual students.
- All materials and support processes, such as online discussions and links to resources and the library, are available online through the LMS.

Educational designers/developers worked with academic staff to conceptualise and design learning activities and learning materials. Staff development workshops were provided to the large number of facilitators who were new to the EBL facilitator role. This was a coordinated approach to support the major curriculum change and implementation.

Evaluation

A previously published study by the authors (McAlpine et al., 2008) considered the suitability of an EBL design for all course units in a curriculum. This current evaluation now aims to address three of the research questions posed in the original paper:

1. What support processes are needed to enable the learning design to be applied to curriculum change?
2. What effects did the curriculum change have on student learning?
3. What factors impact on the effectiveness of a curriculum change?

Method

Data were collected from students and staff through online surveys during the last few weeks of each semester in 2009. Qualitative data were collected from students and staff who participated in the CFY via focus groups at the end of semester two 2009. In addition, a number of staff members with specific responsibilities during the development and the implementation were invited to participate in in-depth interviews.

Online surveys were administered using Survey Monkey™. Independent analysis of the data was commissioned by the Faculty. The data were downloaded to Microsoft Excel™ for range and consistency checks to ensure a clean dataset. As the data were non-parametric in nature Chi square analysis and Fisher's exact test were used to look for relationships. Statistical analysis was performed using SPSS version 17.

All students at all campuses were invited to participate in the online student surveys. Of 1,724 students enrolled in the CFY course in semester one, 506 responses were collected representing a response rate of 29.4%. Of 1,725 students enrolled in the CFY course in semester two, 391 students responded, representing a response rate of 22.7%. Academic staff who participated in the coordination and delivery of the common first year were invited to participate in the online staff surveys. In semester one, 61 staff responded to the questionnaire while in semester two 30 responses were received from staff.

Focus groups were used to provide more meaningful exploration of themes emerging from the online surveys. Students were invited to participate in focus groups on each campus at the end of semester two. A total of 59 students participated in focus groups. Focus groups were independently facilitated by an experienced facilitator external to the Faculty and University. Academic staff were invited to participate in focus groups at the end of the 2009 academic year. Twenty-four (24) academic staff attended one of six focus groups. In-depth interviews with 23 staff were conducted by an independent interviewer external to the Faculty and University.

From this pool of data, comprehensive analysis of the common first year is constructed.

Results

Both quantitative and qualitative data extracted from the evaluations described above are presented and discussed here in terms of the identified research questions.

What Support Processes are needed to Enable the Learning Design to be Applied to Curriculum Change?

Support processes used were:

- Educational design and targeted staff development through working with subject teams on subject design
- Workshops on subject design using EBL available to all staff
- Workshops on EBL processes for facilitators.

No formal evaluation data is available for any of these activities. However, the effectiveness of the design support process is reflected in the evaluation of the effectiveness of the subjects developed.

In relation to my learning in semester two of first year...

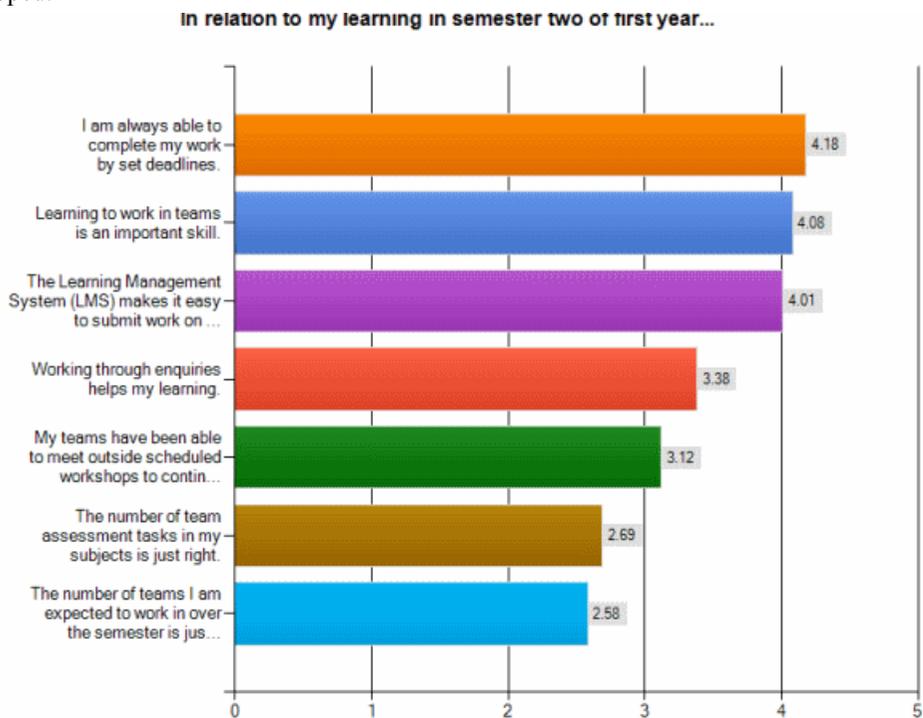| Statement	Mean Rating
I am always able to complete my work by set deadlines.	4.18
Learning to work in teams is an important skill.	4.08
The Learning Management System (LMS) makes it easy to submit work on ...	4.01
Working through enquiries helps my learning.	3.38
My teams have been able to meet outside scheduled workshops to contin...	3.12
The number of team assessment tasks in my subjects is just right.	2.69
The number of teams I am expected to work in over the semester is jus...	2.58

Figure 1: Mean Rating for Responses to First Year Learning

Anecdotal feedback from staff indicated that a significant number did not feel that the initial facilitator workshops adequately prepared them for their facilitator role. Consequently, before the start of the second semester a forum for facilitators was conducted by a group of identified effective semester 1 facilitators so that their experience might be shared and issues related to facilitation discussed. In 2010 a different approach to workshops for facilitators has been used. Now that a cohort of experienced and effective facilitators is available, these staff, assisted by an educational designer/developer, conduct workshops on aspects of facilitation. Through a combination of their experiential authority and modelling of the EBL workshop

format in these facilitator workshops participants are provided the opportunity to both discuss and experience the most effective ways of facilitating student learning in an EBL environment.

What Effects did the Curriculum Change have on Student Learning?

Data from student surveys at the end of semester 2 are shown in figures 1 and 2. The principal emphasis of the evaluation was on the process of learning and whether the support processes were effective in promoting student learning through EBL. The data in Figure 1 relate to student perceptions of their own learning and their perspectives on aspects of the EBL model. There was strong agreement to the statement on the importance of learning to work in teams, and agreement that working through enquiries helps learning. Students were more divided on the optimal number of team assessment tasks and the optimal number of teams to be working in during a semester. The latter was an issue as the students were allocated to a different team for each subject so that they participated in four different teams each semester. Many students also felt that there were too many team assignments.

In relation to learning support in semester two of first year...

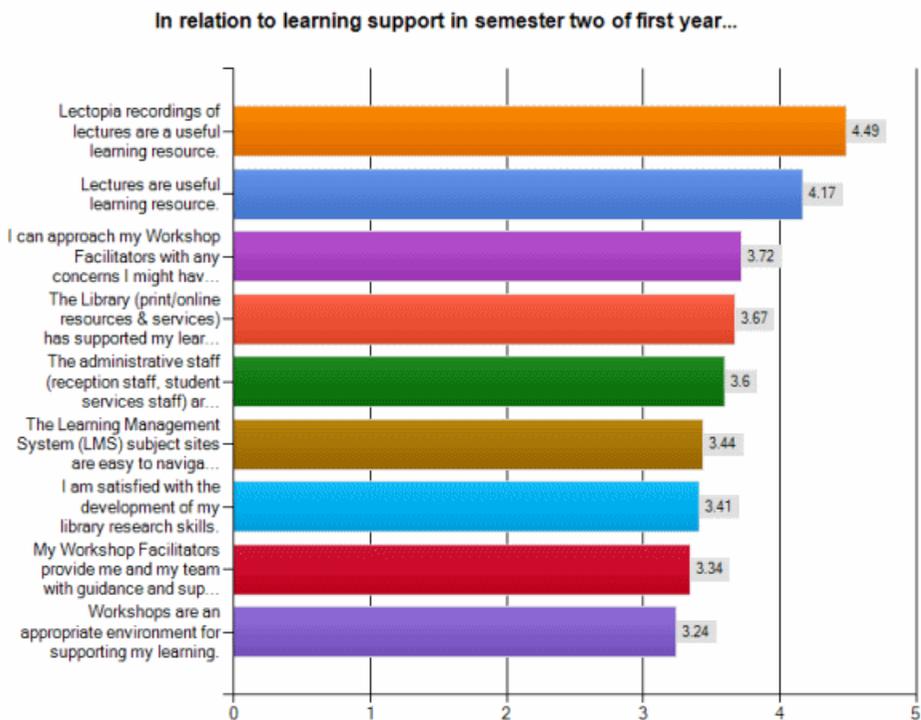| Statement	Mean Rating
Lectopia recordings of lectures are a useful learning resource.	4.49
Lectures are useful learning resource.	4.17
I can approach my Workshop Facilitators with any concerns I might hav...	3.72
The Library (print/online resources & services) has supported my lear...	3.67
The administrative staff (reception staff, student services staff) ar...	3.6
The Learning Management System (LMS) subject sites are easy to naviga...	3.44
I am satisfied with the development of my library research skills.	3.41
My Workshop Facilitators provide me and my team with guidance and sup...	3.34
Workshops are an appropriate environment for supporting my learning.	3.24

Figure 2: Mean Ratings for Responses to First Year Learning Support

Figure 2 shows the data on student perceptions of learning support systems. All received positive responses. Critical aspects of support for EBL were the workshops where the students worked in teams on enquiries; effective workshop facilitators; the learning management system (LMS) that provided online support for EBL; and lectures. It is interesting to note that the students rated lectures highly yet the staff reported relatively poor attendance at

lectures. Workshops, on the other hand, received a lower rating but the reported attendance at these was high.

In response to the statement 'Overall I am satisfied with the first year of my course', 44.1**%** of students agreed compared to 40% after semester 1. Disappointingly, 38**%** still disagreed or strongly disagreed.

Significant differences in level of agreement with some survey questions were noted for students of different age groups, as seen in Table 1.

Table 1: Level of Agreement to Survey Statements by Age

Survey Statement	Younger Students	Older Students (22 yrs and older)	Chi Square (p)
Working through enquiries helps my learning	55.0%	70.4%	20.237 (0.003)
Workshops are an appropriate environment for supporting my learning	43.4%	63.3%	16.381 (0.012)
I have sufficient contact with staff and students in my course	44.2%	58.3%	Somers' d & Kendall tau-b (0.008)
Library resources & services supported my learning in my first year	56.4%	73.4%	14.452 (0.025)
I am satisfied with the development of my library research skills	44.8%	72.2%	24.575 (0.0001)

Qualitative Data

In addition to the focus groups and in-depth interviews, the online surveys enabled students and staff to provide open-ended responses to some survey items. The qualitative feedback provides further clarity on some effects of the curriculum change on student learning and generally reflected quantitative responses to survey items. Emerging themes from the available qualitative data are summarised below.

Student Perspectives

- Students appreciated being organised into teams as it enabled them to get to know other students, including those from other disciplines, and facilitated social contact and friendships.
- Students enjoyed gaining new knowledge and experiences. They reported learning academic, presentation and enquiry skills, but were not aware of more complex analytical skills such as identifying and constructing arguments.
- They were interested in learning about their discipline. Although many wanted discipline-specific subjects in their first year, they did not have access to this but were provided with a series of contacts with discipline mentors.

- Many felt that the EBL workshops could be better organised and they wanted quicker feedback from facilitators on their assignments.
- They wanted more help from facilitators when team processes became dysfunctional.
- Learning was fragmented for students who divided up the team tasks and didn't share their knowledge or ideas or work to bring the whole task together so that everybody learned from it. They saw completion of the task as the important outcome rather than learning during the process.
- Many felt there were too many teams and too much team work.
- Some reported concern about other students who did not make an effective contribution to the team task yet still received the same mark as the students who had done the work.
- Some students did not like being asked to take responsibility for their own learning and wanted more structure.

Staff Perspectives

- Staff reported that students were seen working together in a large number of teams around corridors, the library and other learning spaces. This was taken as a sign of engagement.
- Staff in some areas were impressed with the quality of student work, observing that the standard reached was equivalent to that of second year students.
- Some clinicians remarked that students on placement asked many more questions than in previous years.
- Staff agreed with the students that there was too much team work, and they wanted more emphasis on the disciplines.
- They also observed that many students divided up the enquiry tasks and then did not learn the parts that the other students did.
- Staff in the Human Biosciences reported that students' acquisition of knowledge of Anatomy and Physiology was less than in previous years.
- Some staff had seen no evidence of the deep learning that EBL is intended to promote.
- They felt they needed more facilitator training and support

Staff and students reported similar attitudes to peer review systems. A computerised system for enabling student peer review was trialled unsuccessfully in the first semester; it was very unpopular with students and staff. The peer review process aims to provide all students with constructive formative feedback on their contribution to team tasks so that personal and team performances may improve over time. The trialled process was also used to reward students who made strong contributions to team projects with extra marks, and to deduct marks from students who contributed very little. While there is extensive literature on the effectiveness of student peer review (Topping, 1998), this initial and other peer review processes trialled in the common first year second semester were not deemed satisfactory by staff and students.

What Factors Impact on the Effectiveness of a Curriculum Change?

Scaffolding and support were key issues impacting on the effectiveness of change to the curriculum. A structured process for student conduct of the enquiries and assessment tasks was designed for each enquiry and provided in the student materials. Assessment included a student peer review process for team tasks, so that relative contributions to the enquiry

and related assessment tasks might be factored into the marks for each member of the team. Prior to its implementation many staff had reported lack of familiarity with peer review processes, and were sceptical of students adopting it. Students received minimal guidance in performing the peer review and some students responded with high levels of anxiety or reported some victimisation. More guidance for both staff and students is needed to introduce this process among students who may see themselves as competing with each other.

The issue of peer review was related to a wider issue of teamwork and team assessment. Students were generally happy to work in teams on enquiries but issues emerged over team tasks and team assessment. One problem was that students in many of the teams chose to divide up the team task without working together on the final product, such as a report or presentation. This meant that for these teams each student only knew a small part of the overall topic and didn't develop the full spectrum of intended knowledge and skills, leading to gaps in their learning. More scaffolding and teamwork skill development is needed so that everybody may be supported to follow an optimal learning process.

Although staff development and scaffolding of the facilitation techniques to follow in each subject was provided, many academic staff reported feeling inadequately prepared for the facilitator's role. Some were seen by students as highly supportive but student perceptions ranged across a continuum to facilitators who were seen as very unhelpful. In the guide to each enquiry students were provided with a structured process for working together. Many first year students, however, appeared unprepared to be self-directed learners and wanted and required further guidance and support. Facilitators need to provide this guidance. Current staff development of facilitation techniques includes input from experienced and effective facilitators on working with student teams to instil good study habits around working in teams. Students need to see the relevance of the team process before they will follow the guidelines. Facilitators can help them to see the relevance of the activity and the team process.

In making these comments the authors acknowledge that these data are drawn from student and staff perceptions of impact. Further indicators of impact on student learning need to be considered, for example graduate readiness for clinical practice. Collection of a range of evaluation data is ongoing.

Conclusions

Overall, the learning design approach used to introduce a common first year across ten health disciplines and five campuses was effective. Students were able to engage with the EBL activities in equivalent ways regardless of their discipline or location. While the systematic approach to learning design and support worked, there were a number of shortcomings in the first implementation. In reality, too much was attempted at once with the result that some aspects were dealt with better than others and further work is needed to improve many areas.

Evaluation data pointed to several ways in which the system may be improved. Some changes were made for the second semester and more again for the second intake in 2010.These include:

- Students participate in only two teams in their first semester, by remaining in the same team for two subjects.
- The introduction to EBL and development of teamwork skills has been extended and now occurs over the first five weeks in one subject.

- Some reduction in the number of team assessments, particularly in one first semester subject that originally had 80% team based assessment
- Peer review is used less.
- Workshops for facilitators are run by identified effective, experienced facilitators who demonstrate ways of encouraging the most effective learning process.

In this way, combined with some detail changes to the methods associated with some subjects, the impediments to achieving the most effective outcomes may be overcome so that the intended benefits of the common first year may be fully realised. Levels of student satisfaction are higher in the initial stages of the 2010 implementation of the common first year, and anecdotally academic staff are more comfortable with the facilitator's role.

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