

The challenge of evaluating rural undergraduate multi-professional education

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INTRODUCTION

While some authors have differentiated between the two terms [1–3] multi-professional or interprofessional education commonly refer to a process whereby students of different disciplines are provided with structured opportunities to learn together for periods of their education [4,5]. This concept has been widely adopted in undergraduate health professional programs around the world and extensively described in the literature. In a systematic review Cooper et al. found 141 articles on the topic [6]. It seems that there is broad agreement that an active process of collaborative learning is beneficial in encouraging students to think beyond professional boundaries and develop a better understanding of each others' professional role, with the aim of better communication and participation in team-based care. It is convincingly argued that the traditional, separatist model of health professional education does not appear to equip graduates with the interprofessional communication and collaboration skills that are essential when they enter the workforce [7–10].

The rationale for this change in health professional education is that there is an ever-present and growing need for improved teamwork in health care. It can be argued that the combination of heightened consumer awareness, higher costs of health care delivery and an increase in the prevalence of chronic and terminal illnesses in an ageing population places increasing demands on individual health professionals. Thus, there is a greater dependence of patients, particularly those with chronic conditions, on a network of the health care providers who should ideally be able to communicate effectively with one another about optimal diagnostic and treatment regimes. As the number of health professionals and the range of interventions increases with the complexity of cases, so the risk for poor patient management, cost escalation and suboptimal health outcomes also increases due to poor collaboration. This has given rise to calls for core competencies, such as interdisciplinary teamwork, evidence-based practice and quality improvement, to be included in health professions education programs [11]. In spite of these calls the vertical 'silos' of health professional teaching and learning are resistant to horizontal integration. The mismatch between the way we educate health professionals and the realities of professional practice were well summarised by Mary Wakefield from the Center for Rural Health at the University of North Dakota when she made the observation that "Schools of health professionals generally are not interdisciplinary but practices increasingly are, which poses a serious disconnect" [12].

Calls for interprofessional collaboration date back to the 1970s [13,14] and the concept gained increased impetus in the 1980s and 1990s in the United Kingdom and elsewhere with changes in government policy [15]. In line to this global trend, the Faculty of Health at the University of Newcastle (UoN) in Australia used collaborative teaching techniques in the 1980s. In the late 1990s the Faculty began exploring more innovative methods of cross-disciplinary collaboration in student learning. More recently, with the establishment of the University Department of Rural Health (UDRH), Northern New South Wales in Tamworth the opportunity to co-locate undergraduates of different health professional programs in a rural health care setting gave rise to the development of a series of short-term Multi-professional Learning Modules (MLMs). The rural context added to the relevance of the modules because in rural areas the shortage of health professionals, limited access to specialist services and a broad case-mix increases the need for collaborative professional practice [16–18]. The later modules were developed with consultation and participation from academic staff of the University of New England (UNE), adding cross-institutional collaboration to the initiative.

AIM

This paper describes teaching methods used for delivery of the MLMs, as well as evaluation methods and results. However, it also raises the critical question of whether multi-professional education (MPE) will be effective in promoting long-term changes in the graduates' approaches to their professional practice and whether the health outcomes of patients will be improved. This same question occurs repeatedly in the literature and there appears to be wide acknowledgement that there is a need for more substantial evidence of the benefits in terms of better practice outcomes [8,10].

METHODS

Module delivery

A multi-disciplinary team of academics from UNE and UoN worked with clinicians from the New England Area Health Service, all having experience in rural health education and service delivery, to develop and deliver a set of five MLMs over a period of approximately three years, between 2001 and 2004. The module topics were chosen on the basis of the relevance to a wide range of health professionals and the need for collaborative care. They also focused the students' attention on aspects of patient care that were felt to be of particular importance to rural health professionals. So far only one of the topics has been repeated, but in a substantially changed format. Module topics are shown in Table 1.

Each of the modules had a set of learning objectives specific to the health care topic, however, all of the modules had the following common learning objectives:

- for the students to interact across professional boundaries
- to give them the opportunity to develop their professional communication skills
- to encourage the students to explore the boundaries of their own professional identity
- for the students to develop a better understanding of health professions other their own
- to promote a health care work ethic based on effective teamwork

Table 1 Profiles of each of the multi-professional learning modules

Module title	Student participants*	Duration	Methods of delivery	Methods of evaluation
Team Approach to Stroke	4 Med 3 DR 2 N&D 1 OT	4 x 2 hr sessions over 4 weeks	<ul style="list-style-type: none"> • Didactic • Expert panel discussion • Clinical site visit 	
Ethical Health Care and Professional Practice	4 DR 4 Med 3 OT 1 N&D 1 SP	2 x 2 hr sessions over 2 weeks	<ul style="list-style-type: none"> • Didactic • Group discussion • Online material • Videoconference • Directed learning 	<ul style="list-style-type: none"> • Categorical • Role descriptions • Open comments
Self-Care and Child Protection †	7 N 6 N&D 4 Med 3 DR 2 OT	Total of 8 hours in 3 sessions over 2 weeks	<ul style="list-style-type: none"> • Didactic • Role play • Group discussion 	<ul style="list-style-type: none"> • Categorical • Open comments
Major Trauma and Clinical Error	22 N 7 N&D 6 DR 4 Med 2 OH&S 1 OT 1 SP 1 Phy 1 SW	2 x 3 hr sessions in one day	<ul style="list-style-type: none"> • Expert panel 'hypothetical' • Mock coroners court 	<ul style="list-style-type: none"> • Categorical • Visual analogue scale • Open comments
Child Protection in Clinical Practice †	19 N 10 Med 6 DR 6 N&D 5 OT	2 x 3 hr sessions in one day	<ul style="list-style-type: none"> • Didactic • Role play • Group discussion 	<ul style="list-style-type: none"> • Categorical • Visual analogue scale • Open comments

* Med = Medicine, DR = Diagnostic Radiography, OT = Occupational Therapy, N&D = Nutrition and Dietetics, N = Nurses, SP = Speech Pathology, Phy = Physiotherapy, SW = Social Work, OH&S = Occupational Health and Safety
 † The content of the first child protection module was substantially modified and redelivered.

Similar learning objectives have been identified in several other multi-professional education initiatives described in the literature [6].

Module content was split between aspects of clinical service delivery and generic qualities of health professional practice. This was achieved by the extensive use of hypothetical clinical scenarios. In this way the students could contribute from the unique clinical perspective of their own profession, as well as being challenged to participate from more broadly. The “Ethical Health Care and Professional Practice” module, for example, was based on the scenario of an elderly patient admitted to hospital after a stroke, who was then the subject of various decisions made on her behalf by health professionals and her family during the acute, sub-acute and rehabilitative care phases. It was designed to focus the students’ attention on ethical decision making in the light of practice guidelines issued by the various professional bodies. The “Self-Care and Child Protection” module used a variety of child abuse scenarios to provide the students with mechanisms of dealing with their own feelings when faced with emotionally challenging health care situations. While child abuse is a universal problem of concern to all health professionals, students gained an increased awareness of the particular difficulties that can occur in small rural communities where it may involve someone you know, either as the victim or the perpetrator.

Table 1 lists the number of students from the various disciplines who participated in each module. Most were in the latter years of their programs and numbers varied depending on what students were on placement in the UDRH region at the time the module was delivered. The MLMs were short, though often intensive, educational experiences for the students, consisting of a number of two or three hour sessions. These were timetabled as part of the students' academic activities, although attendance was not compulsory. Sessions were delivered either during one full day or spread out over several weeks.

Methods of delivery varied depending on the nature of the content. Most included a didactic component where the students were supplied with necessary background knowledge to participate meaningfully in group discussions, role play and so on. The exception was the "Major Trauma and Clinical Error" module in which the students were part of a large audience, consisting of similar numbers of students and clinicians/academics, who watched an expert panel discuss a hypothetical, though familiar, country road trauma scenario. The audience was encouraged to ask questions of the panel members. A mock coroners' court case followed, because of the unexpected death of one of the accident victims in the major trauma 'hypothetical'.

Evaluation

With the exception of the first module, "Team Approach to Stroke", which was delivered in the very early days of the UDRH, before staff were on site, both process and impact evaluations have been carried out. Because of the difficulty of finding an appropriate, validated measurement tool of the outcome of MPE a variety of purpose-designed instruments have been used. The lack of a validated outcome measure has been criticised elsewhere [6,19,20]. A list of the evaluation methods is given in Table 1. Common amongst them was both a categorical measure, similar to a Likert scale, and open comments solicited from the students.

While the method of measurement and the style of questions asked varied for the process evaluation, depending on the method of delivery, impact evaluation for all modules included questions about the students' knowledge of other health professions and their perceptions of the appropriateness of multi-professional practice. Both pre- and post-module questionnaires were administered. The precise nature of the questions varied depending on the module content, as did the method used. For example, role descriptions were only used in the "Ethical Health Care and Professional Practice" module (see below). In the "Major Trauma and Clinical Error" and the "Child Protection in Clinical Practice" modules visual analogue scales [21] were used to assess the amount of change in the students' perceptions of the importance of collaborative practice in the scenarios presented.

RESULTS

Over the five modules delivered so far a total of 137 students from nine different disciplines have actively participated. In addition, about 80 clinicians and academics have participated in various roles, from observers to experts. While most students participated in only one module, some have participated in two. Space does not permit a detailed presentation and analysis of the evaluation results for all of the modules in this paper. Instead some representative results will be shown and subsequently discussed.

For the "Ethical Health Care and Professional Practice" module the students were asked to complete a questionnaire at the beginning of the first session and the end of the last session that required them to list two types of service that four different professions (their own plus three others – see Table 2) might be expected to provide in treating the patient in the scenario. Gold

standard answers were developed by academic staff and the students' answers were compared to these. A simple, 'role knowledge' scoring system was designed for this purpose, as follows:

Role allocation correct and in sufficient detail	= +2
Role allocation correct but lacking in detail	= +1
No answer given	= 0
An incorrect answer	= -1

Table 2 Pre- and post-module student 'role knowledge' scores for each of the four health professions represented

Profession/discipline	Students (n =)	Mean score (\pm sd)	
		Pre-module	Post-module
Nutrition and Dietetics	1	10.0 (\pm 1.4)	12.0 (\pm 1.2)
Diagnostic Radiography	3	7.0 (\pm 0.8)	10.0 (\pm 1.1)
Medicine	3	8.7 (\pm 0.9)	10.7 (\pm 0.9)
Occupational Therapy	3	8.3 (\pm 0.8)	12.3 (\pm 1.0)
Total students	10	8.2 (\pm 1.2)	11.3 (\pm 2.1)

Students could score a maximum of sixteen points by correctly ascribing two roles to each of the four health professions. Only ten of the thirteen students correctly completed this section of both questionnaires. Their scores are shown in Table 2. The students' role knowledge of each of the health professions increased during the two weeks that the MLM was conducted, the mean score for all students increasing from 8.2/16 to 11.3/16.

At the end of each session of this module students were also asked for written comments. Overall the responses were strongly positive and commonly insightful. They were analysed qualitatively and expressed in common themes. In response to the question of what they gained from the session the most strongly evident themes after session one were that "ethics is important for all health professions" and that "different professions bring a different perspective to ethical issues". After session two the strongest theme was the "importance of joint decision making and working as a team". When asked how the MLM contributed to their understanding of ethical decision making, the students' comments again reflected a better understanding of a "variety of viewpoints". One student commented that:

It contributed to my understanding by raising questions from other points of view, which made me think differently. (DR.2)

And another:

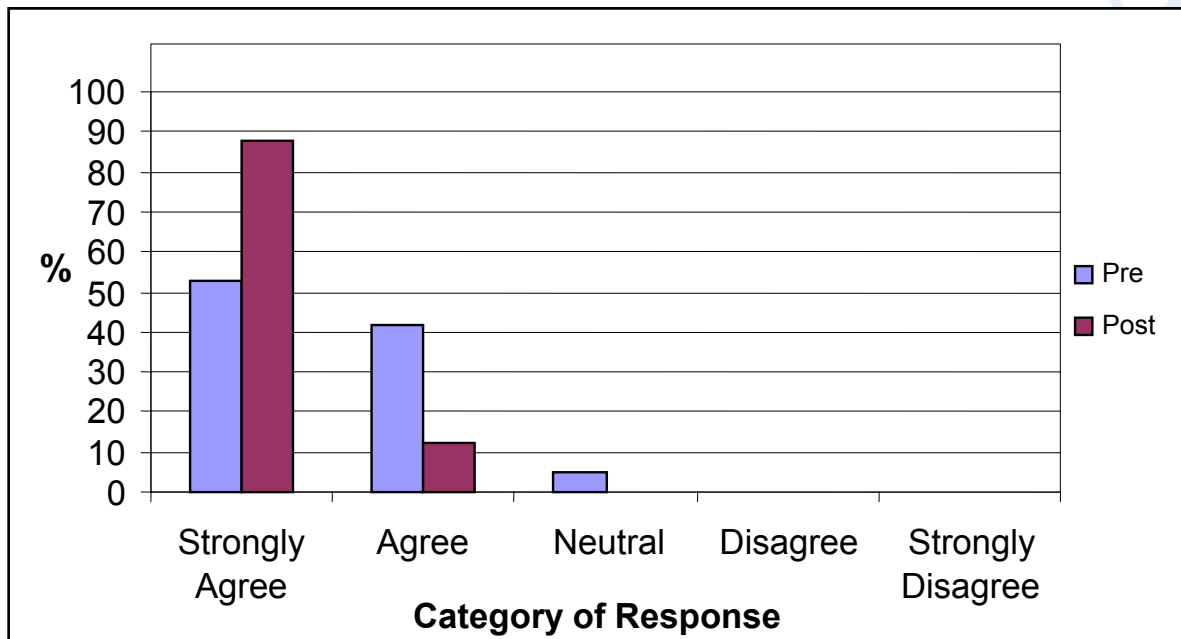
Multi-disciplinary teams are the future of health care – please continue to persist with modules like this. Why did this have to wait for our final year? (OT.2)

However, some students did not appreciate it as much as others, with one student who apparently felt that further education on clinical ethics was unnecessary commenting that:

This was tedious. There are different levels of ethics education. This is only beneficial in a multi-disciplinary sense. (Med.2)

The evaluation of the "Self-Care and Child Protection" module showed that at the beginning of the module fifty-three per cent of the students (12/22) "strongly agreed" with the statement that "a multiprofessional approach is very important in child protection cases". After completion of the module, eighty-eight per cent of the students (19/22) strongly agreed with this statement. There was stronger overall agreement in the post-module compared to the pre-module questionnaire, as can be seen in Figure 1.

Figure 1 Evidence of a shift in favour of a multi-professional approach to child protection after completion of the “Self-Care and Child Protection” module



The students’ open comments in the evaluation of this module also showed an overwhelmingly positive attitude to multi-professional education and practice. For example, one of the students commented that it is important because we...

... need input from a range of professionals to formulate the best care plans. (N&D.4)

Another student made the observation that:

One health professional cannot deal with these situations alone; other professions need to be consulted to give thoughts and ideas on how to approach the situations. (N.3)

In the later “Child Protection and Clinical Practice” module the quantitative evaluation using the visual analogue scale (VAS) was not definitive. Only nineteen students completed both the pre-module and post-module questionnaires. The VAS was scored by the students placing a cross on a continuous, 10 centimetre long line with one end of the line was labelled “Unimportant” (0) and the other end “Imperative” (10). The mid-point of line was labelled “somewhat important”. In response to the question of the importance of a multi-professional approach in child protection the average score in the pre-module evaluation was 8.97/10 but in the post-module evaluation it had fallen marginally to 8.58/10, including two outliers. This difference was not statistically significant ($p = 0.42$, paired T-Test) suggesting that there was no impact on the students’ attitude to multi-professional practice, using this method of evaluation.

Both pre- and post-module VAS scores were quite high, suggesting that the students appreciated the value of multi-professional practice even before participating in the module. Perhaps some had high expectations but the VAS results were confirmed by the students’ mixed comments after completion of the module. One student commented that:

I didn’t think this module enhanced multi-professional interaction. Yes, we did learn together in one lecture theatre but I did not become more aware of other health professional’s role etc. (OT.2)

And another that:

I learnt a lot that I didn't know before I came today. It should be quite useful on upcoming prac and in the future. It's shown communication is important between different professionals. (N.12)

DISCUSSION

The MLMs placed the students in hypothetical situations where they had the opportunity to increase their awareness of the need for collaborative clinical practice and teamwork. The evaluation of the “Ethical Health Care and Professional Practice” module showed that the students’ role knowledge of each others’ professions had increased, particularly about the role of the allied health professions, where the scores increased markedly. The fact that their role knowledge score for doctors in the health care team did not increase as much is not surprising, given that medical role is perhaps the best known of all health professional roles. After completion of this module the students also expressed a deeper appreciation of a wider range of perspectives resulting from their interaction and discussion of the clinical and ethical issues related to the case scenario.

From the evaluation of the “Self-Care and Child Protection” module it was evident that the students developed a better understanding of the need to work as a team when dealing with complex and emotionally charged health care issues such as child abuse. Between the beginning and end of the module the participants’ perception of the importance of a multi-professional approach to such cases had increased. However, in the second of the two child protection modules the students’ attitude to multi-professional practice did not appear to change overall according to the evaluation methods used. This may have been because the method was not appropriate for this purpose or not well understood by the students, but it seems likely to have been because of the way the module was delivered, focusing much more on the child protection aspect than on multi-professional teamwork. It appears therefore that the outcomes are variable and dependent on the method of delivery as well as the content.

Cooper et al. [6] describe the outcomes of MPE in terms of Kirkpatrick’s hierarchical levels of evaluation [21]. It seems that the MLMs described above have been effective up to the levels of ‘reaction’ (providing a satisfactory learning experience) and ‘learning’ (affecting the students’ knowledge, attitudes, skills and beliefs). However, to be totally effective, in terms of this model, there needs to be evidence of transfer of the learning into experiential practice and modification of the students’ learning environment.

Some studies have found that the students themselves will resist attempts at collaborative teaching and learning because it “forces them to learn irrelevant skills” [22]. One very positive aspect of the MLMs is their relevance. Rather than focusing solely on the teaching and learning of a generic aspect of clinical practice, such as communication skills or clinical ethics, the MLMs have integrated these into aspects of clinical care, such as the management of stroke patients, major trauma and child protection. In this way the students’ have had the opportunity to interact across traditional professional boundaries in a realistic, yet hypothetical, clinical context. Some other MPE initiatives have aimed to achieve relevance by the establishing clinical teaching units within the existing health care system only to find that entrenched organisational, structural and attitudinal barriers detract from the aim of the educational experience [20]. By separating the learning exercise from the clinical environment, but encouraging clinicians to participate as a source of expert knowledge, has the potential benefit of changing practice philosophy without encountering some of the barriers and restrictions imposed by the existing health system.

Overall, the MLM evaluation results are encouraging; however, some limitations are worth noting. Firstly, the number of students who correctly completed both pre- and post-module evaluation questionnaires for each module was small. This, together with the fact that participation was limited to only those students involved in the UDRH program, may have biased the results. Nevertheless, there appears to be just cause to feel positively disposed towards multi-professional education within the collaborative, rural environment of the UDRH.

It must also be acknowledged that the MLMs are a limited and isolated part of the students' education and whether or not there will be any long-term behavioural change in their clinical practice, or indeed any observable benefit in terms of patients' health outcomes or reduced costs, is impossible to know at this stage. The success of MPE in the long-term will require some dramatic and extensive changes to health professional education. However, no matter the extent of global support for the concept of MPE, the tertiary education sector will be reluctant to make the substantial program alterations and resource commitment without evidence of a clear benefit [23].

CONCLUSIONS

The multi-professional education landscape is dotted with relatively small scale initiatives that lack clear evidence of effectiveness in promoting long-term and much needed changes to the way health care is practiced. The time seems right, however, to consolidate and move forward into a new era of health professional education collaboratively. In Australia the establishment of the UDRHs has the potential to bring about such a change. The rural environment in which health care is more collaborative by necessity means that some of the resistance is minimised. The staffing of the UDRHs is also much more multi-disciplinary than is the norm in the mainstream tertiary education system. At the same time, the links between the UDRHs and their parent campuses places them in a position of influence with the traditional health professional education providers.

There is an opportunity for the network of UDRHs in Australia to co-ordinate a strategy of longitudinal evaluation of multi-professional education in the rural context, using established research guidelines [6]. In this way a sustainable model of collaborative learning and clinical practice may be developed. In addition, we may be closer to answering the critical question of whether fundamental changes can be made to professional practice and health outcomes.

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