peer
learning
in higher education

learning from & with each other

EDITED BY **DAVID BOUD, RUTH COHEN & JANE SAMPSON**

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Dedication

In memory of Geoff Anderson, our collaborator, who did not live to see the fruits of our projects.

Contents

Contributors

David Boud is Professor of Adult Education, Faculty of Education, University of Technology, Sydney (UTS).

Ruth Cohen is former Head of the School of Adult Education, Faculty of Education, UTS.

Jim Cooper is Senior Lecturer in the Faculty of Law, UTS.

Robert Connor is a Lecturer in management, Faculty of Business, UTS.

Mark Freeman is an Associate Professor in finance and economics, Faculty of Business, UTS.

Ray Gordon is a Lecturer in management in the Faculty of Business, UTS.

Denise Kirkpatrick is Professor and Director of the Teaching and Learning Centre, University of New England.

Brian Lederer is a Lecturer in the Faculty of Information Technology, UTS.

Jo McKenzie is Senior Lecturer in the Institute for Interactive Multimedia and Learning, UTS.

Robert McLaughlan is Senior Lecturer in the National Centre for Groundwater Management, UTS.

Richard Raban is Head of the Department of Software Engineering, Faculty of Information Technology, UTS.

Jane Sampson is a Lecturer in adult education, Faculty of Education, UTS.

Jenny Toynbee Wilson is Associate Professor in Visual Communication, Faculty of Design, Architecture and Building, UTS.

Acknowledgements

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Introduction: making the move to peer learning

David Boud

In everyday life we continually learn from each other. For most of the things we need in our working and personal lives we find enough information and guidance from friends and colleagues. It is relatively uncommon to take a course or consult a teacher. We draw upon whatever resources we need wherever we can find them. Most people who use word-processing packages have not studied them formally: they receive tips from others, observe what they do and ask questions. Similarly, when buying a car, reviews in newspapers or magazines might be read, owners of cars of the type wanted consulted and sales staff listened to.

It might be argued that these are not necessarily the most efficient ways to go about learning and that they do not always lead to us obtaining accurate information, but they do meet the needs of most people in a timely and convenient fashion. The advantage in learning from people we know is that they are, or have been, in a similar position to ourselves. They have faced the same challenges as we have in the same context, they talk to us in our own language and we can ask them what may appear, in other situations, to be silly questions.

Learning from each other is not only a feature of informal learning, it occurs in all courses at all levels. Students have conversations about what they are learning inside and outside classrooms whether teachers are aware of it or not. The first approach, when stuck on a problem, is normally to ask another student, not the teacher. Not only can they provide each other with useful information but sharing the experience of learning also makes it less burdensome and more enjoyable. The power of peer learning is manifest daily in popular culture and many books and movies illustrate its influence. *The*

Paper Chase is a classic example of a feature film that portrays students learning from each other in competitive professional courses.

As teachers, we often fool ourselves in thinking that what we do is necessarily more important for student learning than other activities in which they engage. Our role is vital. However, if we place ourselves in the position of mediating all that students need to know, we not only create unrealistic expectations but we potentially deskill students by preventing them from developing the vital skills of effectively learning from each other needed in life and work. The skill of obtaining accurate information is not learned by being given accurate information by a teacher but through practice in discerning how to judge the accuracy of the information we receive.

This book is based on the assumption that there is considerable benefit in taking what we know of the value of informal peer learning, making it explicit and using it more directly in the design and conduct of higher education courses. Formalizing the informal is not intended to give teachers a more prominent or controlling role in informal learning, but to realize the potential benefits of peer learning so that all students can benefit from it, not just those who are socially adept or best networked. It is neither possible nor desirable to formalize all aspects of peer learning. However, quite modest moves in that direction can have a large impact on learning compared to the effort expended by teachers.

The book is also based on the premise that peer learning – that is, learning with and from each other – is a necessary and important aspect of all courses. The role it plays varies widely and the forms it takes are very diverse, but without it students gain an impoverished education.

The aim of the book is to explore the use of peer learning in formal courses. It addresses questions such as:

● What is peer learning and what is it good for?
● How can it best be fostered?
● What issues need to be considered by teachers and students?

It draws on the direct experience of the authors in using peer learning in their own courses and in studying its effects. The focus is on higher education but many of the ideas are applicable more widely.

What is peer learning and why is it important?

Peer learning is not a single, undifferentiated educational strategy. It encompasses a broad sweep of activities. For example, researchers from the University of Ulster identified 10 different models of peer learning (Griffiths, Houston and Lazenbatt, 1995). These ranged from the traditional proctor model, in which senior students tutor junior students, to the more innovative learning cells, in which students in the same year form partnerships to assist each other with both course content and personal concerns. Other models involved discussion seminars, private study groups, parrainage (a buddy system) or counselling, peer-assessment schemes, collaborative project or laboratory work, projects in different sized (cascading) groups, workplace mentoring and community activities.

The term 'peer learning', however, remains abstract. The sense in which we use it here suggests a two-way, reciprocal learning activity. Peer learning should be mutually beneficial and involve the sharing of knowledge, ideas and experience between the participants. It can be described as a way of moving beyond independent to *interdependent* or mutual learning (Boud, 1988).

Students learn a great deal by explaining their ideas to others and by participating in activities in which they can learn from their peers. They develop skills in organizing and planning learning activities, working collaboratively with others, giving and receiving feedback and evaluating their own learning. Peer learning is becoming an increasingly important part of many courses, and it is being used in a variety of contexts and disciplines in many countries.

The potential of peer learning is starting to be realized, but examination of the ways in which it is used in existing courses suggests that practices are often introduced in an *ad hoc* way, without consideration of their implications. When such practices are used unsystematically, students unfamiliar with this approach become confused about what they are supposed to be doing, they miss opportunities for learning altogether, and fail to develop the skills expected of them. Much peer learning occurs informally without staff involvement, and students who are already effective learners tend to benefit disproportionately when it is left to chance.

Formalized peer learning can help students learn effectively. At a time when university resources are stretched and demands upon staff are increasing, it offers students the opportunity to learn from each other. It gives them considerably more practice than traditional teaching and learning methods

in taking responsibility for their own learning and, more generally, learning how to learn. It is not a substitute for teaching and activities designed and conducted by staff members, but an important addition to the repertoire of teaching and learning activities that can enhance the quality of education.

It is important to consider who are the 'peers' in peer learning. Generally, peers are other people in a similar situation to each other who do not have a role in that situation as teacher or expert practitioner. They may have considerable experience and expertise or they may have relatively little. They share the status as fellow learners and they are accepted as such. Most importantly, they do not have power over each other by virtue of their position or responsibilities. Throughout the book we will be discussing the role of students who are in the same classes as those from whom they are learning.

Peer *teaching,* or peer *tutoring*, is a far more instrumental strategy in which advanced students, or those in later years, take on a limited instructional role. It often requires some form of credit or payment for the person acting as the teacher. Peer teaching is a well-established practice in many universities, whereas reciprocal peer learning is often considered to be incidental – a component of other more familiar strategies, such as the discussion group (see, for example, Brookfield and Preskill, 1999). As a consequence, until recently, reciprocal peer learning has not been identified as a phenomenon in its own right that might be used to students' advantage.

Reciprocal peer learning typically involves students within a given class or cohort. This makes peer learning relatively easy to organize because there are fewer timetabling problems. There is also no need to pay or reward with credit the more experienced students responsible for peer teaching. Students in reciprocal peer learning are by definition peers, and so there is less confusion about roles compared with situations in which one of the 'peers' is a senior student, or is in an advanced class, or has special expertise.

Reciprocal peer learning emphasizes students simultaneously learning and contributing to other students' learning. Such communication is based on mutual experience and so they are better able to make equal contributions. It more closely approximates to Habermas' notion of an 'ideal speech act' in which issues of power and domination are less prominent than when one party has a designated 'teaching' role and thus takes on a particular kind of authority for the duration of the activity.

We define peer learning in its broadest sense, then, as 'students learning from and with each other in both formal and informal ways'. The emphasis is on the learning process, including the emotional support that learners offer each other, as much as the learning task itself. In peer teaching the roles of teacher and learner are fixed, whereas in peer learning they are either undefined or may shift during the course of the learning experience. Staff

may be actively involved as group facilitators or they may simply initiate student-directed activities such as workshops or learning partnerships.

According to Topping's review of literature, surprisingly little research has been done into either dyadic reciprocal peer tutoring or same-year group tutoring (Topping, 1996). He identified only 10 studies, all with a very narrow, empirical focus. This suggests that the teaching model, rather than the learning model, is still the most common way of understanding how students assist each other. Although the teaching model has value, we must also consider the learning process itself if we want to make the best use of peers as resources for learning.

As mentioned earlier, it is important to recognize that peer learning is not a single practice. It covers a wide range of different activities each of which can be combined with others in different ways to suit the needs of a particular course. It is like peer assessment in this regard (Falchikov, 2001) and it is unfortunately similarly misunderstood as referring to a particular practice.

Why do we need to focus now on peer learning?

There are both pragmatic reasons and reasons of principle for the current focus on peer learning in university courses. It would be naïve to ignore the most pressing pragmatic reason even though it has little to do with concerns about teaching and learning. It is that in many countries there is considerable pressure on university funding, which has lead to staff being required to teach more students without diminution in the quality of the student learning. This has prompted a search for teaching and learning strategies that might help staff to cope with larger student numbers without increasing their overall workload. Peer learning is promising because it appears to maintain or increase student learning with less input from staff.

We are not so cynical as to think that this has been the prime motive driving interest in peer learning. Concurrent with this financial pressure has been a reassessment of the goals of university courses and new emphasis has been placed on generic learning outcomes. Employers now want graduates who possess a broader range of skills and abilities to communicate effectively beyond their specialization, and so courses are now expected to develop in students what are variously termed transferable skills (Assiter, 1995), key competencies (Mayer, 1992), generic attributes (Wright, 1995) or capabilities (Stephenson and Yorke, 1998). These are part of a repertoire of skills and strategies designed to foster lifelong learning in the student. Candy, Crebert

and O'Leary (1994: p. xii) cited 'peer-assisted and self-directed learning' as the first of five teaching methods in undergraduate courses that encourage graduates to become lifelong learners, as well as helping them to develop 'reflective practice and critical self-awareness'.

Technology is now an important driver towards the use of peer learning. Effective courses do not involve the delivery of substantial amounts of content through new media (Stephenson, 2001). Web-based activities appear to be most effective when there is direct interaction between staff and students and among students themselves. The nature of the Web as a medium means that it is impossible for a teacher to personally deal with a large number of interactions between a teacher and individual students. This soon becomes far more time consuming than any form of conventional teaching. How then is the need for interaction reconciled with the limitations on the capacity of teaching staff? Peer learning provides a key solution to this dilemma. It is possible for tutors to deal with the volume of interaction emerging from *groups* of students working together in a way that is not realistic with individuals.

In addition to these 'mainstream' motives, it is also argued that collective forms of peer learning suit some students better than the individualistic teaching and learning practices of traditional courses (Slavin, 1995; Chalmers and Volet, 1997). This has been particularly true for women and students from some cultural backgrounds, as peer learning activities value cooperation within groups above competition and encourages greater respect for the varied experiences and backgrounds of the participants.

How does peer learning link to other ideas and practices?

A common misconception is that peer learning is simply about using group work in courses. This is not surprising, as some of the strongest proponents of group work are also major scholars of cooperative learning (Johnson and Johnson, 1997). Of course group work does involve peers learning from each other (Jaques, 2000), but much peer learning also occurs on a one-to-one basis and peer learning need not be primarily about learning to work in groups.

There are a number of other practices discussed particularly in the North American literature, which have some similarities to peer learning. These include cooperative learning and collaborative learning. There is a substantial literature on cooperative learning (for example, Jacob, 1999) and it is discussed in best selling books, such as Johnson and Johnson (1997). However, most of

the applications are not in higher education and the role of the teacher is much stronger than in the examples we will be discussing here.

Cooperative learning grew out of developmental psychology – cognitive, social, developmental psychology. Attention was focused on the processes of group interaction, individual skill development, social learning and management of the educational environment. These activities took place within an established body of knowledge/discipline and authority for knowledge was vested in the teacher. The emphasis was on the process used by teachers to achieve specified educational outcomes. Teacher intervention and management is expected to set goals, determine activities and measure and evaluate educational achievement. Group learning is structured to achieve a balance between process and skills and knowledge acquisition.

The practice known as collaborative learning is used more in higher education in the US. The emphasis is on the setting of open-ended but focused tasks to students who work together to solve them, thus encouraging interdependent learning (Bruffee, 1999). Collaborative learning had its genesis in adult and adolescent learning with the notion of participatory learning. Groups engage in exploration of ideas and knowledge and learning to learn. Teachers may set up structured activities but their specific means of achievement are left to the group. Learning is the key concept, not education. The teacher is more a facilitator, negotiating the learning and evaluation with learners and handing over more control. The group determines group roles and it is the personal sense of the learning that signifies collaborative learning. Critical thinking, problem solving, sensemaking and personal transformation, the social construction of knowledge – exploration, discussion, debate, criticism of ideas are the stuff of collaborative learning. The implicit assumption is that adult learners are experienced social beings who can act in a collaborative manner, organize themselves, have some intrinsic motivation or educationally imposed motivation and do not require the imposed structures of the facilitator to inspire learning. Bruffee (1999) names this approach 'constructive conversation' – an educative experience in which students learn by constructing knowledge as they talk together and reach consensus or dissent. Dissent, questioning each other's views within a group, is a necessary part of learning.

Despite these distinctions, there is considerable overlap in practice between cooperative and collaborative learning, and in some discussions the terms are used interchangeably. However, there tends to be a greater emphasis on direction by teachers in cooperative learning. There are also other approaches that have some common characteristics with these and include features of peer learning. An example is the use of syndicate groups, common in management education but used extensively in other settings (Collier, 1983).

What outcomes does peer learning aim to promote?

Peer learning promotes certain types of learning outcomes. Some of these are not so easily achieved through other teaching and learning strategies. While different varieties of peer learning emphasize different outcomes, some of the common learning outcomes include:

- *Working with others.* The skills involved in working with others include teamwork and being a member of a learning community. Peer learning can prompt a sense of responsibility for one's own and others' learning and development of increased confidence and self-esteem through engaging in a community of learning and learners. Much learning takes place from sharing others' experiences, existing knowledge and skills. Students learn to acknowledge the backgrounds and contributions of the people they are working with. Peer learning necessarily involves students working together to develop collaborative skills. Working together gives them practice in planning and teamwork and makes them part of a learning community in which they have a stake.
- *Critical enquiry and reflection.* Challenges to existing ways of thinking arise from more detailed interchanges between students in which points of view are argued and positions justified. It provides opportunities for formulating questions rather than simply responding to those posed by others. There is evidence to suggest that fostering critical reflection and reassessment of views more readily comes from interchange between peers (Smith and Hatton, 1993) than even from well-planned discussion sessions with teachers. Depending on the particular activities chosen, peer learning can provide opportunities for deep engagement in the learning process, as students are learning through their relationships with peers, not just trying to 'beat the system'. Students are often better able to reflect on and explore ideas when the presence and authority of a staff member (Boud and Walker, 1998) do not influence them. In peer learning contexts students generally communicate more about the subject area than they do when staff are present. They are able to articulate what they understand and to be more open to be critiqued by peers, as well as learning from listening to and critiquing others.
- *Communication and articulation of knowledge, understanding and skills.* Concept development often occurs through the testing of ideas on others and the rehearsing of positions that enable learners to express their understanding of ideas and concepts. It is often only when they are expressed

and challenged that students appreciate whether they have a good grasp of what they are studying. There are often limited opportunities for this without peer learning activities. Invaluable additional practice in practising skills is often available in peer settings especially when direct supervision is not required for safety or ethical reasons.

- *Managing learning and how to learn.* Peer learning activities require students to develop self-management skills and managing with others. They are not being continually prompted by deadlines from staff (although there may be some ultimate deadlines) but through the exigencies of cooperating with others. This demands different kinds of self-responsibility as it involves obligations to others and maintaining one's position in a peer group. Many peer-learning activities require students to cooperate on quite substantial tasks which students have to work out how to tackle for themselves with minimum specific direction. Such tasks require students to construct an environment in which they can identify their learning needs and find ways of pursuing them within time constraints. Peer learning involves a group of students taking collective responsibility for identifying their own learning needs and planning how these might be addressed. This is a vital skill in learning how to learn. It also allows students to practise the kinds of interaction needed in employment. Learning to cooperate with others to reach mutual goals is a prerequisite for operating in a complex society. Peer learning prompts the acquisition of knowledge about ways of working with others in groups and one to one, and the implications of one's own learning choices on others. Seeing the different approaches that others use can broaden the base of understanding about variation in learning (Bowden and Marton, 1998).
- *Self and peer assessment.* There are seldom enough opportunities for formative assessment and getting feedback from staff in order to develop skills and concepts significantly. Peer learning settings provide opportunities for additional self and peer assessment of a formative kind. It provides opportunities for giving and receiving feedback on one's work and a context for comparing oneself to others. This mirrors the kinds of informal assessment activities that take place daily in the world of work: self-assessment and peer judgements are more common and can often have a more powerful influence in professional work than formal appraisals. Practice in identifying criteria to assess one's own learning and applying this in a variety of circumstances is a key element of sustainable assessment needed for lifelong learning (Boud, 2000).

Why does it need to be managed?

Peer learning, usually organized by students themselves, has always been a key feature of student life, but for a number of reasons these informal arrangements are beginning to break down or to be undervalued. However the experience of peer learning is known to be a significant component of a student's overall academic experience (Light, 1992) and the skills developed from working closely with peers are also considered very relevant preparation for most workplaces. This is especially the case in the project-based work environments of contemporary organizations. In order to ensure that peer learning opportunities are available to all students the processes need to be promoted and managed. This means including peer learning explicitly as part of the formal academic programme. Some responsibility for the initiation and management of these parts of courses needs to be taken by academic staff. The extent of the responsibility they take is a matter of careful judgement. If it is directed simply as another teaching task, then the benefits of students taking responsibility for their actions can be eroded and some of the potential beneficial outcomes cannot be realized. On the other hand, leaving it for students to initiate and manage may mean that it never takes place or that it only benefits a restricted group.

It is instructive to note some of the reasons why informal arrangements have been breaking down. The first reason is changes in the student profile. For many students, opportunities to meet outside class may be very limited due to work, family and other commitments. Informal meetings outside classes also favour friendship groupings and some students simply do not have the time or the social skills necessary to develop successful relationships. Such students, who may include those already disadvantaged, are therefore excluded from much of the peer learning experience. Although the need for many students to have part-time work has always had an influence on student life there is a diminishing of campus life as more students engage in more paid work. There are fewer 'full-time' students able to spend time at university talking with peers; most students have to work in some way to pay fees and living expenses. Those most in need of peer support mechanisms may therefore have least access to them.

Another reason informal peer learning may have become less common is that student populations are becoming more fragmented as students are given more choices about how they study a course. With broader subject choice, students are able to design their own progression of subjects. This means that they are less likely to be studying their course with an acknowledged class or cohort, or part of a particular home group of peers. This loss of continuity with peers can affect a student's informal learning, which traditionally has

added so much to a student's university learning experience. Recent literature suggests that progress through a course with the same class can have significant and positive effects on student learning (Wesson, 1996).

Other factors that have reduced the opportunities for students to benefit from peer learning exchanges include the effects of changes in university funding. In many courses these changes have lead to the creation of larger class groups, particularly in tutorial groups. Traditionally, the purpose of tutorials was to provide students with a place to work closely with each other and to develop their ability to express, debate and discuss different points of view. These opportunities have been limited because of increases in the size of class groups.

Informal peer learning arrangements have also diminished as students have failed to recognize the important work and learning skills peer learning develops, such as interpersonal communication, team work, project management and general research and study skills. The competitive nature of many courses and the scramble for jobs after graduation may make the idea of freely sharing one's knowledge with other students seem unattractive. Some students may also refuse to believe that they can learn anything worthwhile from other students.

Thus, only by formally acknowledging peer learning within the study curriculum can appropriate recognition for the process and its outcomes be achieved (Saunders, 1992). Once students have been introduced to peer learning through planned activities, they usually realize that they have more to gain than to lose. We therefore need to provide opportunities for different types of peer learning by building relevant activities into the course of study itself. This means more than just planning a few small group discussions to fill the gaps between lectures. By managing peer learning we are formalizing what would be a highly unpredictable and selective process if left to students and their casual conversations outside the classroom, and also making the process more inclusive. Formalizing the activities also enables more deliberate review of the process and outcomes, thus making the benefits and difficulties more visible.

An important goal is to establish an environment of mutual help that continues over time and beyond the classroom. As Kail (1983) points out, if students work together only during class, then at the end of the semester, when the class has disbanded, there will be no opportunity to continue developing the group relationship. This obviously requires an institutional culture able to nurture and sustain such an environment. Peer learning will not be effective if it is introduced in isolation from other parts of the learner's life and without regard to what is happening in other parts of the course.

We need to manage the learning process in ways that draw upon the best features of traditional peer teaching and learning, without it being overly managed and prescriptive. Much of the value of these strategies for learners comes from exploration and the sense of discovery. These experiences are easily lost when prescriptive or predetermined methods are used. The key to successful peer learning, then, lies in the mutually supportive environment that learners themselves construct, and in which they feel free to express opinions, test ideas and ask for, or offer help when it is needed (Smith, 1983). Providing a structure within which this can occur is the challenge for teachers and course designers.

Does peer learning have to involve face-to-face contact?

While the original involvement of most of the contributors to this book arose from working with students in face-to-face settings, new interest has arisen more recently from those confronting the challenges of learning online. In courses where students meet each other in person, normal social interaction creates opportunities for peer learning at every turn. These opportunities have to be used by students and may need to be prompted by teachers, but they often exist without prompting. In distance learning there is no meeting of students or interaction between them unless it is especially contrived. This observation of the obvious points to why the use of peer learning facilitated by staff is a more urgent and unavoidable concern in distance courses and online settings (Salmon, 2000).

Of course, peer learning can occur, in principle, in distance courses that rely on correspondence by conventional mail, but this is difficult and ponderous when students do not meet. Peer learning has been prompted in such courses by the use of residential summer schools or weekend workshops. The use of the Internet opens new possibilities. At the simplest level, students may exchange e-mail addresses and form a discussion list. This enables all students to have ready contact with one or more of their peers as easily as sending a single message. Discussion lists formed around groups of, say, six to twelve students can maintain dialogue with each other and readily discuss issues and collaborate on tasks. Lists comprising all students run the risk of degenerating into devices for administrative use or one way communication between tutors and students as the volume of messages in an active discussion can test the patience of the most avid learners.

The limitations of e-mail communication – overloading students and teachers and the difficulty of easily tracking discussion themes – has led to

the use of Web-based discussion as the medium of choice for peer learning in distance or online courses. An environment such as WebCT, Top Class or Blackboard has the facility to host as many discussion groups in as many combinations as teachers or students choose, and there are packages such as Lotus Notes that can be used without an institutional commitment to a Web-based environment. All use what is termed 'threaded discussion' to display those who have contributed on each subject. There is a record of which contributions have been read and responses can be made as easily as clicking to reply and simply typing a contribution. Students can simply discuss an issue or use a discussion forum as a means of working together on a common task. The only disadvantage this medium has over the use of e-mail is that those using the environment have to log in specially to see the discussion. This is more than balanced by the ease of navigation.

These two uses are the 'bread and butter' of peer learning among students at a distance and have become so commonplace that they are hardly worth mentioning in discussions of innovation. There are more sophisticated forms and uses of online learning, which are discussed in Stephenson (2001) and later in this book. A number of the developments in the use of computers in peer learning are taking place under the heading of computer-supported collaborative learning (CSCL). There have been bi-annual international conferences on CSCL since 1995 and a substantial literature is now available (for example, McConnell, 1999). Many of the practices described do not involve peer learning as such, but there are still good examples of this to be found there.

What led to the production of this book?

The project that eventually led to this book started five years ago. Four of us (the present editors and our late colleague, Geoff Anderson) working in what was then the School of Adult Education at the University of Technology, Sydney (UTS) identified a common interest in our own teaching. We all placed a great emphasis on students learning from each other. We were using different strategies and teaching different topics across the range from undergraduate to doctoral level, but we shared a concern that our exclusively adult students should engage in study that was personally meaningful to them and that involved them in working well with each other. We were using student-led workshops, study groups, team projects, student-to-student learning partnerships and peer feedback sessions. The four of us put together a successful proposal for a National Teaching Development Grant. This enabled us to

document and analyse our existing practices, evaluate their effects on students and make them available to others. Key features of the guide produced as a result of this project have been incorporated into the present book.

Not content to limit these ideas to a Faculty of Education, we recruited collaborators to extend the exploration of peer learning practices to other disciplines and professional areas. Very interesting examples of peer learning were taking place in business, law, design, information technology and engineering at UTS and these greatly extended the repertoire of peer learning approaches that could be considered, not least into the area of online learning. The students involved included recent school leavers and in some cases much higher numbers of overseas students than was the case in the original adult education study. In order to assist other teachers in higher education to benefit from the combined experience, we considered that the best way would be to bring these approaches together in the present book.

What does the book emphasize?

The contributions to this book focus primarily on the use of peer learning in coursework programmes. There is considerable use made of peer activities in research degree studies, particularly in professional doctorates, and in clinical work and field placements, but the special demands of these contexts demand treatment in their own right. The focus here is on the normal undergraduate and postgraduate classes that most teaching staff in higher education deal with on a regular basis.

The book is structured in two parts. The first addresses the key features of peer learning: How can peer learning activities be designed and incorporated into courses (Chapter 2)? What are some common approaches used in higher education courses (Chapter 3)? How can peer learning activities be managed effectively (Chapter 4)? And what are some of the key issues involved in peer learning and assessment (Chapter 5)? These chapters are written by the editors and draw extensively on their experience in using peer learning in courses in education, mainly with adult education students.

The second part of the book broadens the disciplinary base of examples of subjects in which peer learning has been used. The authors come from the areas of design, management, law, information technology and engineering. They describe different examples of applications of peer learning in their own courses. Their case studies illustrate the different cultures of higher education disciplines and each picks up a particular theme.

In 'Team-based learning in management education' (Chapter 6) Ray Gordon and Robert Connor describe their experiences in using peer learning to pursue the important objectives of promoting student autonomy and focusing on new organizational forms within a large MBA programme. They faced the particular challenges of students from diverse backgrounds working with each other in groups.

Jenny Toynbee Wilson in 'Project management teams: a model of best practice in design' (Chapter 7) also simulates the group-based nature of work, but with first-year undergraduate students studying design. Individual project work is difficult in large classes but through peer learning in group projects she was able to more effectively reproduce the experience of working in teams while providing students with opportunities to get feedback on their design activities through peer assessment.

Jim Cooper teaches law, and in 'Peer learning in law: using a group journal' (Chapter 8) he shows how, like Ray Gordon and Robert Connor in management, he has used group journals. His emphasis is quite different to that in the management course: the focus in management was on learning about working in a group; in law it was to appreciate current legal issues. This chapter examines the issues surrounding the use of the journal, and the problems of designing, introducing and implementing a journal within the context of an introductory subject.

Information technology and computing courses frequently use project work, but Brian Lederer and Richard Raban in 'Autonomy, uncertainty and peer learning in IT project work' (Chapter 9) place particular emphasis on students learning without the intervention of tutors and on how they have used group assessment.

Chapters 10 and 11 in this section explore the use of peer learning through electronic-mediated communication. Robert McLaughlan and Denise Kirkpatrick in 'Peer learning using computer supported roleplay-simulations' (Chapter 10) describe an innovative combination of peer learning and computer mediated simulations to teach about the social, political, economic and scientific dimensions of decision making. These processes have been used with senior undergraduate and postgraduate students, bringing students from engineering to work collaboratively with political science students, and students from engineering to work with students from geology.

Mark Freeman and Jo McKenzie in 'Aligning peer assessment with peer learning for large classes: the case for an online self and peer assessment system' (Chapter 11) provide an account of working with large undergraduate classes in business. They show how self and peer-assessment can play a key role in motivating the positive outcomes of teamwork and inhibiting the possible negative aspects given the strong links between assessment, student effort and

learning. They consider how self and peer ratings can also be used to encourage peer learning when used for formative feedback purposes and show how they have operationalized this through a Web-based strategy.

The third section includes the closing commentary on the key issues raised by the book. It locates peer learning as a vital element of course design in an era in which the use of teaching staff will be limited. It points to how peer learning is an integral part of a high quality learning environment and identifies some important questions that need to be addressed if peer learning is to develop further.

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