



Learning to Participate: Responding to Changes in Australian Land and Water Management Policy and Practice

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Introduction

The degradation of Australia's land and water resources is now widely recognised as a critical issue requiring holistic and transdisciplinary solutions (Healthy Rivers Commission of New South Wales 2000). This situation has placed increased importance on programs of study which aim to integrate physical and human dimensions of resource and environmental management (REM). One of the consequences is that 'learning to participate' is becoming an increasingly important feature of learning design. Coupled with this specific need are more widespread teaching concerns about the development of lifelong learning skills in undergraduate curriculum (Candy *et al.* 1994). Among the considerations arising from these circumstances are questions about the most appropriate mechanisms for facilitating and developing students' understanding of the 'super-complexity' (Barnett 2000) and 'swampy lowlands' (Schön 1987) of professional practice. This paper describes a role-play activity that has been developed and applied at Macquarie University to facilitate learner understanding about and preparation for participatory approaches to work practice, with an emphasis on the environmental decision-making process. To provide the context for the discussion the trends in REM are briefly reviewed. Then, the design of the activity is outlined and the teaching and learning outcomes are discussed.

Situating the round table exercise

The REM program at Macquarie University is jointly situated within the Departments of Physical and Human Geography.

A B S T R A C T

Rapid changes to resource and environmental management systems are occurring in Australia. These include increased emphasis on a whole-of-ecosystem approach, adaptive management, and community participation in decision-making. The need to respond to these rapid changes raises new educational challenges, which are being addressed in the Resource and Environmental Management program at Macquarie University through a round table exercise in environmental decision-making. Using an environmental flow allocation scenario, with a combination of face-to-face meetings and online tasks, this role-play activity requires students to assume a stakeholder role, formulate a position paper, question the views of other stakeholders, and negotiate to reach a consensus-based outcome. A key outcome is the learners' active engagement in an authentic task that exposes them to many of the uncertainties they will face in professional practice.

Two third-year undergraduate units in this program aim to integrate biophysical, socioeconomic, political, and cultural material in addressing specific issues such as river management and land degradation. The Water Resources module of the 'Land Management' course has recently introduced a round table exercise in which students are required to research a particular scenario, develop and question stakeholder positions, and take part in a role-play negotiation session. Key aspects of the exercise are the application of scientific information, understanding the range of positions on a resource management issue, and sending a positive message that complex and contested situations can be resolved in practice. In 2001 the exercise was based on decision-making by a river management committee over the allocation of environmental flows.

Trends in resource and environmental management

Despite significant gaps in scientific information, many see the key challenges in REM as institutional, that is developing appropriate planning and decision-making processes (Lee 1995, Dovers & Lindenmayer 1997). As a reaction against top-down command and control management (Holling & Meffe 1996), participatory approaches are being developed which involve community stakeholders in the management regime. This devolution of decision-making has been accompanied by two other innovations. Firstly, a whole-of-ecosystem approach is being used, in which a wide range of components of the human and biophysical systems are considered to have a 'stake' in decisions (Murray-Darling

Basin Commission 2001, Szaro et al. 1998). Secondly, gaps in information and the inherent complexity and variability of Australian ecosystems have led to the adoption of adaptive management. Under this approach, planned interventions occur despite limited data and imperfect understanding (Lee 1995) and the outcomes are closely monitored and fed back to inform future decisions (Haney & Power 1996, Mitchell 1998).

The raft of policy changes which have occurred in water management during the last ten years have been referred to as the water reform agenda (Dunlop et al. 2001). At the national level, these changes have included the elimination of subsidies on water pricing, disconnection of property and water rights, environmental flows, and a cap on extractions of water in the Murray-Darling Basin (Cullen 1998, Murray-Darling Basin Commission undated). These policy signals have since been reflected in the actions of State governments, which have primary responsibility for land and water management.

In New South Wales, river management committees (RMCs) were established in 1997 on a number of inland rivers in New South Wales. The immediate task of these Committees was to formulate environmental flow rules, requiring the use of biophysical and socioeconomic information in an attempt to reach a decision by consensus (New South Wales Department of Land and Water Conservation 1998). It would be all too easy for the divergent interests of irrigators, conservationists, and government agencies to lead to the formation of blocs and alliances, resulting in information being assessed according to its support for a particular stakeholder interest. However, over time, a broader and more considered approach to information-handling and decision-making has evolved, along with a growth in 'social capital' (sensu Cox 2000), including factors such as mutual trust, inclusiveness, and transparency (Finlayson 2001, Marshall 2001). These gains have been remarkable given the level of resentment in sections of the rural community over environmental flow proposals.

The work of RMCs therefore provides a rich field for learning about participation in REM. Environmental flow assessment requires the strong application of a whole-of-ecosystem approach, both to avoid over-emphasis on iconic parts of the ecosystem, and to develop a genuine sense of community ownership of decisions. The process of decision-making is as important as the content. Even with the best available data, a flawed institutional setting will fail to turn that data into useful information and knowledge, and the ultimate decision will be lacking in equity and effectiveness. The educational challenge is to provide opportunities for undergraduate students to engage in innovative activities that are authentic and prepare them for conditions of increasing uncertainty; a situation which requires creative solutions to address specific professional practice issues (McHardy & Allan 2000, Bowden & Marton 1998).

The round table exercise: Design considerations

The round table exercise design incorporates many of the

concepts and principles associated with constructivism. From this metatheoretical stance a key concern is 'how people make sense of the perplexing variety and constantly changing texture of their experience' (Candy 1991, p. 255). Important assumptions are that learners' are actively involved in the construction of meaning and recognise that this process is influenced by the social and cultural context of the experience (Barab & Duffy 1999). Key learning theories that are relevant within this worldview and are reflected in the design of the activity' are situated learning theory (Billet 1994, Lave & Wenger 1991) and cognitive apprenticeship (Collins 1997). Taken together these theoretical approaches raise a number of pedagogical principles for the design of learning. Barab and Duffy (1999, p. 6) summarise these as: engagement in domain-related practices and authentic tasks; ownership of the inquiry process; coaching and modelling of thinking skills; opportunities for reflection; ill-structured dilemmas; and collaborative approaches to learning.

The use of role-play (a well established teaching technique) as the organising design framework provides an effective vehicle for simulating many of the characteristics associated with constructivist approaches to learning. One of the benefits is the ability of this approach to situate the learning experience, while simultaneously acknowledging the importance of learning from and through experience (Boud et al. 1993, Boud & Miller 1996). Another is its role in facilitating the development of what Biggs (1999, p. 41) refers to as 'functioning knowledge'; that is a combination of propositional knowledge (knowing about—the academic knowledge base), procedural knowledge (knowing how—having the skills) and conditional knowledge (knowing the circumstances in which to use the skills). This 'functioning knowledge' is important for professional practice and it must be considered in curriculum design and learning activities.

The round table exercise: The structure and process

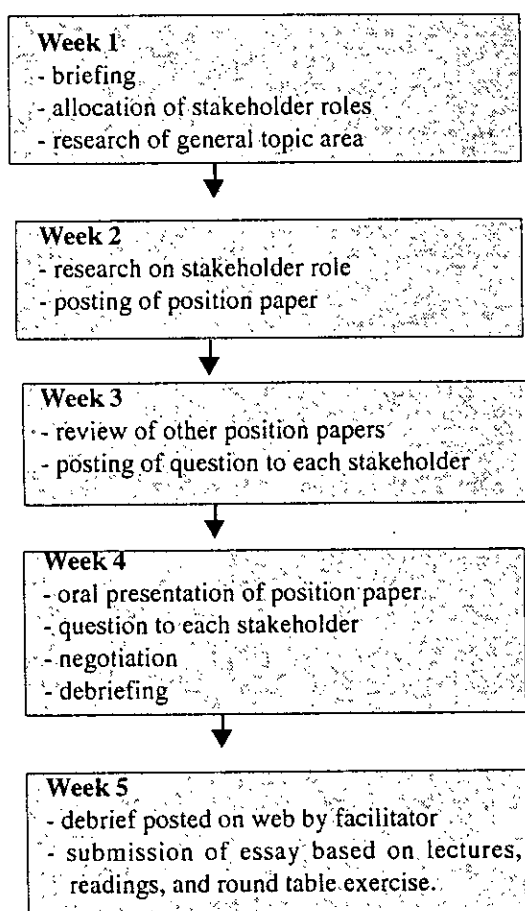
The round table exercise is structured to provide enough scaffolding or support for students to complete the task, incorporating face-to-face tutorials as well as online tasks and resources. Students are provided with written guidelines outlining the activity, including the participation requirements and the assessment processes. The web resources and online communication tools are housed within a WebCT environment, the integrated web-based course delivery system centrally supported by the University. This environment acts as the virtual classroom space for student interaction during the online component of the activity.

The exercise is built around the simulation of a 'real life' meeting of a river management committee based on the research of one of the authors (Hillman 2000). The meeting related to the allocation of a volume of 'environmental' water in a large dam that remained unused from previous years. The river management committee's task was to decide how to utilise this water for environmental gains, or whether to convert it to general use. In the exercise, stakeholder positions are created based on the actual composition of the committee,

including irrigators, conservationists, an aboriginal representative, and various government agencies.

An overview of the round table exercise is given in Figure 1. In week one, a face-to-face session, students are briefed on the scope of the exercise and the week-by-week requirements plus the assessment procedures. At this session, through a process of negotiation, each student is allocated a stakeholder role in a round table group of up to 16. Efforts are made to engage the students in this process, such that they gain some 'ownership' of the exercise. A written brief is also placed on the WebCT site together with a guide to the resources available. Students are required to research the general topic area using online and library resources.

Figure 1: Overview of Round Table Exercise



In week two, each student prepares and submits a 150-word stakeholder position paper on the WebCT site for the Unit (the online/virtual classroom space). The emphasis is on a short, 'punchy' but well substantiated piece. To access these position papers students click on the stakeholder name on the 'round table' interface, which reveals other positions and standpoints on the issue (Figure 2). In addition, each student posts three references to support their position paper.

In week three, students review all other position papers and post questions on the discussion board to each stakeholder in their round table group (i.e. around 15 questions are posed).

The questions posed (online) by others are used to appraise, and possibly modify, their own position paper in preparation for the class-based exercise in week four.

In week four, a face-to-face session, students meet as a round table group and participate in the role-play exercise. The lecturer/tutor acts as an 'independent chair' or facilitator for these sessions. For the first part, each student presents their position paper and the facilitator poses one of the questions (typically the thorniest) from week three. In the second part of the session, negotiation aimed at reaching a consensus decision takes place with a debriefing process at the end. Following the completion of the face-to-face sessions, the facilitator posts a formal 'debrief' on WebCT which canvasses the various issues arising from the sessions, plus some additional material on conflict resolution tied to the scenario and simulation exercises. Students are encouraged to respond to this material through the discussion board.

Assessment tasks

Assessment of the module is in two parts. Firstly, students are awarded a mark for the round table exercise itself, based on the position paper and questions to other stakeholders. Secondly, students write an essay based on the scenario, which is expected to integrate lectures, reading, and the exercise, itself. A range of resources is made available for the exercise. Formal literature mainly takes the form of journal articles on biophysical and institutional issues in REM. Web based material is usually more directly relevant to the round table scenario, such as government reports and discussion papers. 'Grey literature' provides an important part of the resource material, in particular information produced by the management body itself in the form of unpublished reports, scoping papers, etc. Lecture material, background briefing and information papers plus a debriefing summary are also provided on WebCT.

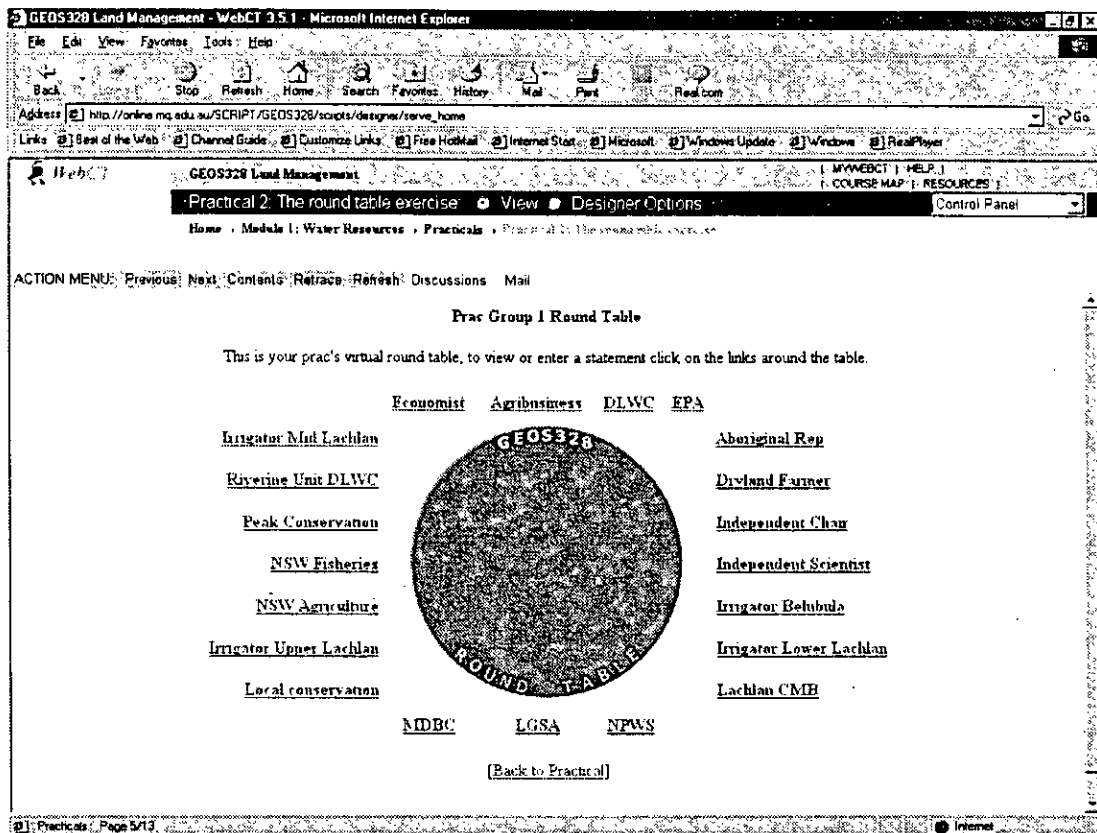
Teaching and learning outcomes

The alignment of the learning objectives, teaching and learning strategies, and assessment processes in the round table exercise provides an example of a 'constructively aligned' (Biggs 2000) activity designed to promote a 'deep approach' to learning (Marton & Säljö 1984, Ramsden 1992, Bowden & Marton 1998). The constructivist principles that influenced the design of the role-play are used to frame the discussion about the outcomes of this activity, most of which revolve around the importance of active engagement in authentic tasks that provide opportunities for developing 'functioning knowledge' (Biggs 2000).

Participating in learning and learning to participate

In preparing students for involvement in participatory approaches to environmental decision-making, the round table exercise moves beyond 'knowledge generation' towards 'knowledge using' (c.f. Cullen 2001). Students are required

Figure 2: The Round Table Tool on WebCT



to build directly on principles and information learnt through their university degree in REM. The exercise has currency and relevance to students as it is firmly grounded in real-life complex situations that require considerable negotiation to achieve a collectively-held outcome—the meetings that make up the core of the exercise actually happened, making environmental decisions on just the issues that the students are required to discuss. The contemporary, authentic nature of the exercise, and the fact that students' prospective employment may require them to be involved in equivalent sorts of situations, has prompted significant interest and engagement.

The emphasis of learning to participate is not just limited to the professional contexts that students will work within following graduation. Rather these participatory approaches need to be considered in curriculum design and incorporated into learning activities, as appropriate. Role-play activities, like the round table exercise, can help to facilitate this dual 'participatory' objective as they encourage engagement in, and develop skills for dealing with, real-world issues within and outside of the learning context.

Teaching approaches for 'situating learning'

Role-play activities provide useful mechanisms for situating learning about complex problems and social interactions (van Ments 1983), particularly those that defy 'recipe book' problem solving approaches. Traditionally, these teaching

strategies have been restricted to face-to-face classroom settings as they are viewed as high-risk activities needing skilled facilitation and careful debriefing. More recently though, with the widespread adoption of online approaches in teaching and learning, the potential role of the web in facilitating this type of activity is being discussed (see for example Wills et al. 2000, Bell 2001, Holsbrink-Engels 2001). In the context of this round table exercise, determining the right mix of face-to-face sessions and online tasks/learning supports was influenced by issues such as: the role and position of this activity in the curriculum; the benefits and limitations of web-based learning in facilitating this type of activity; and staff and student access to and skills in online learning. A decision was made to not replace the face-to-face role-play, but to use the web-based component as a support and scaffold for learning outside of the class-based activities.

The intellectual underpinnings of the role-play exercise are those of increasing students' awareness of, and practical experience in, the process of knowledge sharing, enhancing their collective commitment to learning, while developing their skills in communication and knowledge transfer. Additional goals include greater appreciation of the diversity of perspectives held on a particular issue, as students listen to multiple perspectives presented by their contemporaries, rather than listening directly to their lecturer. The need to work effectively with others, many of whom may have antagonistic perspectives, parallels lessons in life. The exercise moves students beyond traditional teacher-student relationships as a

discursive situation is promoted in which the lecturer prompts debate and dialogue in his/her role as moderator/facilitator, but the students themselves drive the discussion.

Collaborative learning 'in context'

The benefits of the exercise extend well beyond those gained by the students themselves. In many ways, this is just as much a research topic/theme as it is a teaching exercise, as collective engagement in a process of learning is sought. During the role-play the dynamic that is generated, the need to 'think on one's feet', and the very uncertainty of outcomes presents considerable stimulation. Indeed, restraining the spontaneous nature of the discussion may present a facilitation challenge in itself. However, as the core goal of the exercise is to arrive at a consensus decision, all efforts are made to ensure that the activity does not become a 'talk fest'. Rather, through tight time-management and people-management skills, a focused process of inquiry is orchestrated in which an outcome must be attained. As in real-world settings, if an outcome is not achieved, practitioners may become despondent, feeling overwhelmed by the complexities of the task. The debriefing process enables these issues to be 'unpacked' and explored so that students learn about the difficulties associated with this type of decision-making process.

To run successfully an appropriate set of learning tools must be generated in the exercise to enable the diverse abilities of students to be collectively utilised through full participation in the process. This 'process of inclusion' requires broad-based appreciation of multiple ways of seeing, learning and doing. Unless the students, as participants, engage in their individual role as a stakeholder in the decision-making processes, and have a desire to learn from all others involved in this process, some of the potential benefits of the exercise are negated. However, the variable degree of involvement among students represents a real-world experience in itself, and students must learn to work with differing personalities, beliefs, value systems, abilities, and background experiences. The challenge in the classroom, as in the real-world situations upon which this exercise is based, is to work collectively towards a shared understanding, and hence ownership, of the information that is used and the decisions that are made. This process of engagement, which strives to achieve consensus over compromise (or majority-held views), is the ultimate challenge of the exercise, and this is where the real benefits of the exercise can be gained.

Scaffolding and supporting learning

The resource base established for this exercise provides a wide range of materials and encourages students to relate more general information to the specific situation presented in the round table. The specific material is based upon field research, which creates a high level of realism and currency. A major aim is to demonstrate that different stakeholders use different types of information, but that ultimately one decision or decisions can emerge. Unravelling complexities and

uncertainties in this diverse information base is a key issue in decision-making in REM (de Bruijn & ten Heuvelhof 1999). The learning design is seen as an integrative exercise on the theme of stakeholder-based participatory approaches to resource and environmental management. The design is outcome driven and requires students to draw on a range of prior learning in the undergraduate degree. The focus is on avoiding 'doom and gloom' scenarios and providing a real sense of what can be achieved in environmental management through the use of a constructive exercise.

The exercise drives students to 'use' information effectively, thinking creatively about how to convey information in a manner that best serves the interests of their stakeholder position (while recognizing explicitly the need to generate collective outcomes). Effective participation moves student understanding well beyond rote-learning or reporting procedures framed in terms of hypothesis testing. Successful students soon learn that an essential requirement in this exercise is the ability to communicate knowledge in a meaningful and persuasive manner. Differing stakeholder positions will only be engaged through identification of common ground for discussion. Each practitioner has to find ways of trying to achieve this, such that they can engage other stakeholders. This presents a different set of challenges to those students who may be exceptional scientists but cannot communicate effectively. In the same manner, those who converse easily, but cannot see outside their own rhetoric, quickly learn that they have limited credibility. Traditional bounds of teacher to student learning do not necessarily prepare students very effectively for real-world experiences that are beckoning, so the exercise endeavours to break down this conventional approach to learning.

Facilitating active engagement in real tasks

The face-to-face round table discussion is intended to be challenging and fun, balancing learning and enjoyment. In setting out to challenge traditionally-held views and individual stakeholder perspectives and striving towards a mutually-framed outcome, considerable onus is placed on the ability of the facilitator in terms of their capacity to prompt, arbitrate, mediate and ultimately constrain the debate, while allowing practitioners to feel as though they have ownership of the discussion. This process of involvement is integral to the success of the exercise. Ideally, by the end of the exercise, when hopefully a mutually acceptable decision and/or outcome has been arrived at, there is enlightened appreciation of all stakeholder positions around the table, and participants are able to see (or at least recognize) the core issue through different sets of eyes. All efforts are made to move negotiations away from 'block-vote' perspectives that ultimately achieve little other than antagonism, and as such do not present sustainable outcomes to the community. Compromise solutions gained through harsh negotiation are not considered to provide sustainable outcomes, as those who are marginalised (or alienated) through this process are unlikely to take heed of future developments. If practitioners are not

engaged in the process, they are unlikely to become involved in monitoring outcomes; indeed, they may even set out to sabotage the process, physically, verbally, or simply through walking away.


Evaluation and future directions

Evaluation of the exercise has used both quantitative and qualitative methods. Quantitative data on student use of resources, discussion tools, and the roundtable interface were collected using the tracking system of WebCT courseware. An initial 'audit' of learning needs, a final written evaluation, and a focus group was used to obtain more qualitative material.

Overall, feedback about the role-play activity was extremely positive, with the comments highlighting the achievement of many of the learning objectives and teaching aims referred to previously. For instance, students indicated they appreciated the opportunities the exercise provided for gaining insights into the complexities of negotiating real-world REM issues. Another positive feature was the actual design of the exercise, including the integrated nature of the assignment, which provided an avenue for students to articulate their understanding of the professional practice in REM. Most suggestions for modifications focused around the issues students experienced with role adoption and definition. In some respects, this difficulty is not surprising as the exercise is authentic and exposes students to many of the uncertainties they will face in professional practice. Understanding that there is no correct answer, as each group and/or situation may produce a different outcome or conclusion, is often difficult for students to comprehend. Other concerns related to hidden curriculum issues which primarily revolved around students wanting to 'get it right' or achieve 'the results which were asked for' (van Ments 1983). Strategies to overcome these issues are being considered. Modifications for incorporation next year include the use of consultative groups (a recognised role-play technique) to support role preparation and a greater emphasis on the actual debriefing process in the activity.

Conclusion

The round table exercise provides a good example of a 'situated learning' activity that draws on the principles of constructivist approaches to learning. Using the process of the activity as the basis for facilitating learning, the exercise provides the students with an opportunity to participate in a role-play that imposes similar constraints and/or pressures that they may experience in their professional contexts. Exposing students to real-world examples are a critical curriculum consideration, as these types of teaching strategies facilitate students' application of theoretical understanding to professional practice. This point has been reinforced by Barnett (2000), who observes that university courses need to incorporate 'new modes of teaching which focus on the student's being and which produce the challenges of coping with uncertainty' (Barnett 2000, p. 159). Similarly, Bowden and Marton note that higher education needs to prepare

students for 'the unknown by means of the known' (Bowden & Marton 1998, p. 278). 

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