

Teaching Practices for Effective Cooperative Learning in an Online Learning Environment (OLE)

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ABSTRACT

As a teaching practice the application of cooperative learning in tertiary education can present unique challenges for both the practitioner and her students. Mastering this teaching approach requires careful planning, design and implementation for effective deployment in a face-to-face setting. In this setting the success of the cooperative learning approach has been demonstrated. The complexity is significantly increased by additional variables such as the selection and application of technological teaching tools and the change in nature of existing variables including awareness of students' social and communication skills when applying this practice in an Online Learning Environment (OLE). In addition student acceptance of this e-learning approach to learning also needs to be carefully considered. The practitioner must be aware of these factors and have suitable methods in place to support collaboration and interaction between student groups to ensure the ultimate goal with regard to students' learning is achieved. This paper considers how cooperative learning can be combined effectively with these variables and factors of an OLE, and begins with the presentation of a conceptual framework to represent this relationship as a constructive teaching practice. It is anticipated that the conceptual framework would be applied by other practitioners to facilitate cooperative teaching within their OLE. To demonstrate the validity of the framework a case scenario is provided using an Information Technology (IT) undergraduate unit named 'IT Practice'. This is a wholly online unit where extensive participation by the students within small groups is a core requirement. The paper demonstrates the themes of designing curriculum and assessment, as well as flexible teaching strategies for learner diversity but primarily concentrates on managing an effective OLE; that is managing small groups in an online teaching environment.

Keywords: Online Learning, Cooperative Learning, Computer Mediated Learning, Learner Diversity, Assessment

1. INTRODUCTION

Whether the online teaching and learning environment is being driven individually or collaboratively by globalisation, the ever prominent demand for lifelong learning, simulation of work place environments, industry requirements or tertiary institutions, it is all but assured that this approach to teaching will only increase and may even become the learning paradigm of the future. This premise is supported by the affordability and ubiquity of e-learning, which together with facilitating a community of learners is clearly disrupting the dominant technology in higher education – the lecture (Garrison and Anderson 2003, p. 24). Given this state of affairs it is essential that the practitioner is equipped with the pedagogical skill set to manage these OLEs (Nichol & Blashki 2007).

Subsequently the challenge faced by our teaching team can be phrased simply as: How to successfully manage small groups to achieve effective learning in an OLE. Although it may sound somewhat straightforward, the issue becomes quite complex beyond simply placing individuals in groups and telling them to work together. Our experience and application of teaching methods for group oriented activities

has been somewhat challenging in a face-to-face teaching environment. In our view, transposing these ideas onto an online teaching platform presents an even greater challenge.

This paper forms the relationship between the elements and requirements for cooperative teaching and learning environments, and the required elements for effective online teaching and learning. The relationship between both of these areas is represented as a conceptual framework. The framework presents a set of criteria which can be applied to a cooperative OLE. The wholly online unit called IT Practice (see section 4) is used to demonstrate the application of the conceptual framework.

The terms collaborative learning and cooperative learning are sometimes used interchangeably. This is understandable since they both refer to the instructional use of small groups where students work together to complete a particular task (Palmer, Peters and Streetman 2007). However the following distinction is made for the purpose of this paper. The teaching team confer that collaborative learning is the actual social engagement and exchange between the members of a group; the process of working and interacting together to arrive at an answer or solution to the learning task (Smith and MacGregor 1992). Co-operative

learning is different because it refers to the structure that is put in place by the instructor to facilitate collaborative learning. Moreover cooperative learning provides the directions for learning, where the focus is on the product of learning (Myers 1991); the accomplishment of an end product or goal which is closely controlled by the teacher (Rockwood 1995a; Rockwood 1995b; Cooper and Robinson 1998). In contrast to cooperative learning which is teacher-centred, collaborative learning is more student-centred. In collaborative learning the group members respond to an activity by taking a more active role and rely on each other, sharing authority and acceptance of responsibility among themselves to determine the groups' actions (Smith and MacGregor 1992). In this way, these terms have been intentionally differentiated for the purpose of conveying the teachers' role for managing the cooperative OLE as opposed to the students collaborating in their group to solve a particular task.

2. CONCEPTUAL FRAMEWORK FOR MANAGING THE COOPERATIVE ONLINE ENVIRONMENT

This section presents the conceptual framework as the set of criteria for managing the cooperative online environment. As represented in figure 1 managing the cooperative OLE is a continuous process where the management criteria are central to linking learner diversity with curriculum and assessment. Understanding the interrelationship between the three themes empowers the realisation of an effective online cooperative teaching environment. For example we can provide the student with knowledge about how social aspects of reflection can be really valuable by getting students to write a weekly journal. Using this we can assess how they have interacted in the social environment and evaluate what the student has learned as an outcome of being involved in the process of cooperative online learning.

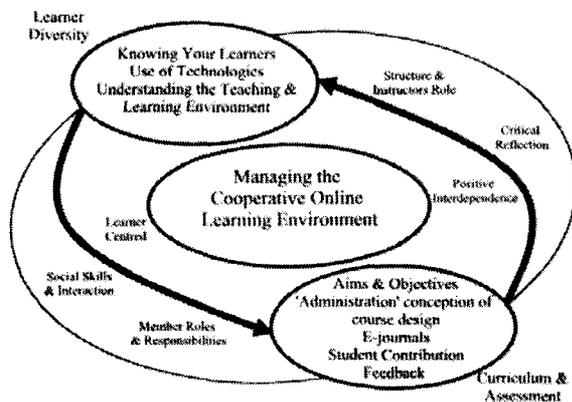


Figure 1. Conceptual Framework for Managing the Cooperative OLE

3. BACKGROUND: ONLINE TEACHING FOR COOPERATIVE LEARNING

The purpose of cooperative learning groups is to make each participant a stronger individual in his or her own right. We know that students who experience teaching that fosters control by the learner not only learn better, but that they

enjoy learning more (Ramsden 2003 p. 98). Individual accountability is central to ensuring that all the participants in the group develop by learning collaboratively. Following the cooperative lesson, participants should be better prepared to complete similar tasks by themselves (Johnson, Johnson, and Smith 1991). The positive effects on achievement of cooperative learning as compared to competitive and individualistic learning are very well documented in the educational literature. Similar effects for higher education students who cooperated in group discussions in preparing for assignments have been reported (Ramsden 2003 p. 98).

For a purposeful educational experience there is an inherent need for an architect and facilitator to design, direct and inform the transaction – in previous practice we have provided the students with the scaffolding for group work e.g. links to readings about group dynamics, but it seems not sufficient direction to articulate understanding of the material or the process. The success of the cooperative exercise will be dependent on this level of articulated knowledge with regard to the process, followed by suitable instruction to convey the material. The requirement for and success of this type of teaching and learning is clearly evident. In particular “the demands of the evolving knowledge society create expectations for individuals to be independent thinkers and simultaneously interdependent, collaborative learners”. In order to create their own knowledge students need to participate in a personally reflective and collaborative process made possible by a community of learners (Garrison and Anderson 2003, p. 22). These collaborative groups are important because “we can test our own understanding and examine the understanding of others as a mechanism for enriching, interweaving, and expanding our understanding of particular issues and phenomena” (Savery and Duffy 1996, p. 137). Further it is documented that students who participate in active learning learn more in student-led discussions, or in learning cells, than they learn in traditional lectures (McKeachie 2002).

Previous research conducted strongly indicates that the online environment is well suited for collaborative group work. Computer Mediated Communication (CMC) has been described as a framework for true collaborative group work in distance education (Henri and Rigault 1996 cited in Stacey 1999). As the use of the Internet for tertiary learning has become more prevalent, the strategy of online collaborative learning has become more commonly accepted (Stacey 1999). Further the effectiveness of collaborative learning in an online environment can be measured by social constructivist theory (learning is not context free, but must integrate the association to real life experiences so that the learner thinks as an expert analogous to professional practice) to the extent that it is “currently the most accepted epistemological position associated with online learning” (Kanuka and Anderson p. 60 cited in Stacey 1999).

The rationale for using groups to learn collaboratively in an online environment has been adequately justified. Learning collaboratively through group interaction has been achieved through the development of a group consensus of knowledge. This has been attained by means of communicating different perspectives, receiving feedback from other students and tutors, and discussing ideas to the point where a final negotiation of understanding was reached (Stacey 1999). In addition higher order thinking can be

achieved where “the act of encoding ideas in textual format and communicating them to others forces cognitive processing and a resulting clarity” (Rourke and Anderson 2002 p. 3). The issue is not concerned with whether this type of learning works but about sustaining an appropriate level of teaching effectiveness to realize its benefits. The question arises though as to how a teacher can effectively manage these groups to foster effective learning in this environment.

4. METHODOLOGY

The educational milieu that this framework was testing in is a wholly online unit called Information Technology (IT) practice, currently offered by Deakin University in Victoria, Australia.

4.1 Information Technology (IT) Practice

This section describes the particular unit, which places the idea of cooperative learning for the conceptual framework into context. Following Deakin University’s requirement for all graduates to have completed a wholly online unit as part of their degree (Rosenburg 2005, p. 1), the School of Engineering and Information Technology nominated IT Practice (a third year undergraduate unit) to be that wholly online unit (Coldwell 2006). There are no face-to-face classes. Online classes consist of a number of structured activities to be done individually including readings, research and assignments combined with a number of activities to be completed as a group comprising discussions, group work and assignments. All teaching and learning takes place in the OLE. The OLE for this particular unit is a combination of Deakin Studies Online (DSO) and United Enterprises (UE) (Coldwell 2006). DSO is Deakin University’s online teaching and learning environment. DSO incorporates a suite of integrated teaching and learning technologies to teach, administer and deliver course material for the primary purpose of enhancing on- and off-campus learning (Deakin University 2007). The unique feature of DSO from a management point of view is the ability to check performance of a particular student on a regular basis by monitoring and maintaining a record of their participation.

Every wholly online unit has a different way in which resources are set up and how the ‘learning’ defined as a subject-based conversation between more and less experienced learners (Ramsden 2003) is delivered. It is the view of the teaching team that studying IT Practice is an entirely different and innovative way of learning online. The underlying pedagogy for IT Practice is Problem-based Learning (PBL) where the students work collaboratively in groups to solve a problem and the problem itself drives the learning. The decision to use this approach is supported by the strong relationship with many of the key characteristics of the computing/IT profession (Coldwell 2006). To this end the focus is on applying knowledge and analyzing and using appropriate tools, techniques and practices that are used in the IT industry. The IT team, and increasingly the IT virtual team is the normal mode of operation for the IT industry (Coldwell 2006). Since it is not possible to send the students out into the ‘real world’ an organization called United Enterprises (UE) which simulates this ‘real world’ is provided for students to practice on. As depicted in figure 2

UE is an interactive Web site that provides the environment for IT Practice and is used for all assessment. The business operations of UE focus on providing products and services in the telecommunications industry.

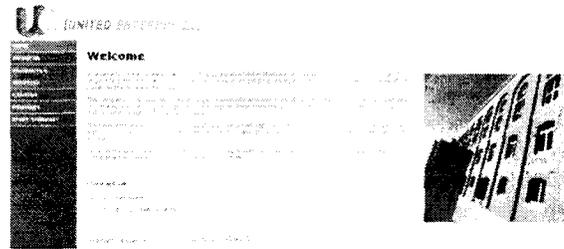


Figure 2. UE Virtual Organization Used For IT Practice

The student demographic made up of about 200 students represents local, domestic, partnership institutions in Asia as well as off campus students studying in other countries across the globe. Students are placed in a group of 7-9 other students by teaching staff and communicate with their group both in DSO and UE.

IT Practice is separated into 5 modules. Each module has a tutor assigned to it. This means that all students have the same tutor for a particular module. The role of the tutor is to facilitate and moderate group discussions, provide assistance and be a mentor for the group. In addition there are a number of experts, employees of UE, who provide assistance with some of the tasks students are required to do. All communication with the UE employees is made through the UE website, simulating that the employees are external from Deakin. Thus the cooperative learning environment is composed of both DSO and UE.

This paper primarily concentrates on UE as this presents the environment in which most of the work is completed and assessed. For the purpose of demonstration Module 1 – IT employment and recruitment will be used. This requires students to practice skills in writing letters of application, resumes and online applications in a simulated environment for the purpose of reaching a plan to improve their chances of employability in the IT sector. Module 1 was selected as the test case primarily because it is the first module. In moving towards working as a team, this module was the first time students had to begin discussing in a group forum in DSO and the first time they were introduced to UE. We could learn about the process students were undertaking to interact with the material and each other in both DSO and UE to individually and collaboratively produce solutions to the assigned tasks within the OLE. This provided the opportunity to identify what was working successfully and what problems including both technical and social issues that needed to be resolved. Using this approach we were able to measure the strengths and weaknesses of the conceptual framework and enhance its operation for the application with the other 4 modules. Having completed teaching of the other 4 modules preliminary observations suggest that the conceptual framework can be applied to all 5 modules. However further investigation is required to verify this with a significant degree of certainty.

A brief description of the other 4 modules follows. In Module 2 – IT teams, students participate in activities to learn how teams are formed and developed and how they are

organized and maintained. This module provides participants with information about team dynamics and issues related to working within a virtual (global) team such as the issue of international diversity. In Module 3 – Ethics for IT professionals', students are directed to complete an online training workshop on ethics and professional practice. In learning about the role and importance of professional ethics in the context of the workplace, students analyze and evaluate situations which involve information technologies, appealing to moral, professional and legal frameworks to make informed ethical decisions. In Module 4 – IT Projects, students participate in team activities such as discussing why projects fail and undertake a project in UE communicating directly with a UE staff member to learn about project management methods, tools and techniques, and how they are applied in an IT context. In Module 5 – IT communication, students participate in tasks such as linking certain business activities with what project managers use for project communications in order to develop effective verbal and written communication and collaboration skills in a virtual team environment.

5. RESULTS AND DISCUSSION

This section presents a suggestive set of cooperative online teaching criteria to aid a teacher confronting the issue of managing groups in an OLE. The criteria are presented under the banners of learner diversity, management strategies, and assessment, which in combination formulate the conceptual framework. The criterion provides a starting point to construct a design around varying unit objectives and perspectives.

5.1 Learner Diversity

In the case of IT Practice, where it is highly probable that the operation of this education system is unfamiliar to many overseas students, the diversity of the student cohort must be considered. In particular it is essential to realize that "there are important interactions between the context of learning and individual differences" (Fransson, 1997 cited in Entwistle and Ramsden 1983, p. 199). The results of one particular experiment showed the first level at which the effects of learning context operate is the student's perception of what he is required to do (Fransson, 1997 cited in Entwistle and Ramsden 1983, p. 199). The perceived interest and relevance of the learning task undoubtedly increases intrinsic motivation. The second level relates to the individual lecturer. The attitude adopted, the enthusiasm displayed, and the interest for helping students to understand is likely to influence his students' approaches and attitudes to studying (Entwistle and Ramsden 1983, p. 199).

5.1.1 Knowing Your Learner

Learning has always been at the heart of the higher education enterprise. It is about "understanding how people learn and that our role as teachers is not just to transmit or deliver knowledge, but our responsibility is to create rich learning experiences and learning environments for our students" (Grundy 2005, p. 1). To become a good teacher, a practitioner first needs to understand their students' experiences of learning (Ramsden 2003). Further, "to design the curriculum it is a matter of starting where students are at

with their interests and their current knowledge so that they can grow as they learn and most importantly that they learn how to learn" (Mousley 2005, p. 2). Therefore getting to know the students and understanding how different learners learn is fundamental as a teacher facilitating learner diversity in online collaborative groups. Some of the practices employed by the teaching staff in IT practice to 'know their learners' included:

- In week 1 ask students to submit a post to their DSO group forum for review and reflection including a summary of their interests, hobbies, working background, description of what they expect to learn, and identification of their strengths and weaknesses.
- Use a questionnaire from a learning survey tool to understand how these students learn.
- Use both instructor-individual and instructor-group interaction.

Another significant factor to understand in relation to knowing your learners is the generational divide. Specifically in IT Practice the majority of students can be placed into the Generation Y (Gen Y) category. This is unique for the cooperative OLE since the youth of Gen Y are influenced most by their peers (Blashki & Nichol 2005). Research has confirmed that the primary factor determining the choice a teenager will make is the experiences of their core group of 3 to 8 friends (McCordle 2003).

5.1.2 Use of Technologies

The use of Information and Communication Technologies (ICT) means lecturers become information managers – "The use of ICT in teaching and learning, particularly online modes appears to initiate a role shift for the lecturer; becoming (information) managers or facilitators of learning" (McShane 2004 p. 4.). In facilitating the connection of students, the technology of e-learning is fundamentally changing cognitive and pedagogical approaches of teaching and learning (Nichol & Blashki 2006b). It is not just a matter of using the technologies for the sake of application; rather wisdom is needed to design applicable learning experiences with the appropriate balance between reflection and discourse (Garrison and Anderson 2003 p. 22). The use of UE is fundamentally providing an entirely different way of learning online. The teaching staff of IT practice communicated to the students the purpose of UE and its relationship to PBL i.e. that it reflects key characteristics of the computing/IT profession; to enable the students to understand this approach to learning and what is expected of them. In addition, the UE interface provided information such as a description of UE, avenue for training, Frequently Asked Questions (FAQs) and contact details.

In previous teaching the teaching team have practiced strategies and responded to requests to enhance learner diversity. One particular example involves the unit called Systems Analysis and Design. In response to students' requests and to allow for a more flexible arrangement, the students could choose between just accessing the audio recording linked with the lecture notes via the Web or separately as a downloadable file to replay for example, on their iPod. In this case the relationship between the teaching strategies and accommodating learner diversity was clearly defined emanating from a planned process. Importantly the

teaching strategies combined with the tools were not merely mixed together with the hope of a productive outcome.

5.1.3 Understanding the Teaching and Learning Environment

A study of questioning and cognitive functioning found that interaction using text-based communication in an online exchange was more intellectually demanding than that found in face-to-face discussion (Garrison and Anderson 2003 p. 23). It seemed that because students have more time to reflect, to be more explicit and to order content and issues, teachers were able to ask higher-level written cognitive questions. Therefore there is a real need to understand the teaching and learning environments especially in online communication-based settings where the key ingredient is the teacher who designs the right balance and blend of collaborative and individual learning activities (Garrison and Anderson 2003 p. 23; Nichol & Blashki 2006b). From experience this is not all just going to happen; it will take time for preparation, to ensure careful planning and design.

5.2 Managing the Online Environment

This section considers and extends the principles previously described to present the cooperative online teaching criteria for managing the OLE.

5.2.1 Social Skills and Interaction

The entire subject of group dynamics is centered upon the premise that social skills are the keys to a group's productivity (Johnson, Johnson, and Smith 1991, p. 21). The view of learning as a particularly social process with language and dialogue being essential for cognitive development (Vygotsky 1978 cited in Stacey 1999) makes social interaction an important element for student learning in collaborative online work groups (Nichol & Blashki 2005). This introduces the necessity to facilitate interaction between a social community of learners by using orientation activities that promote community building (Nichol & Blashki 2006a). One novel way is to set an icebreaker activity where students introduce themselves to each other. For example using the eight nouns technique would require students to introduce themselves using eight nouns together with a description detailing the reason for choosing each noun (Bonk, Kirkley, Hara and Dennen 2000). Subsequently in a group setting each student could then review the postings and select one noun that they could report back to the group. Other social actions may include instructor empathy, interpersonal outreach e.g. welcoming statements, discussion of one's own online experiences, and humor (Bonk, Kirkley, Hara and Dennen 2000).

Strategies were employed by the instructors to create social community within IT practice. The techniques used were the setting of a task such as students introducing themselves to each other within their group as part of the learning activity. A part of the introduction was encouraging the students to exchange interests and have one member introduce another to the rest of the group. For teaching in IT Practice we can: use the eight nouns technique; project our own personality and experiences within these groups and post welcome statements.

Other strategies that can be employed to enhance social skills and interaction online include creating an open and

supportive environment where different viewpoints are valued, making suggestions for students working on tasks, ensuring ideas that are overlooked are addressed and both providing feedback to and seeking feedback from the students (Bonk, Kirkley, Hara and Dennen 2000, Blashki & Nichol 2005). These ideals form the underlying basis for managing the cooperative OLE.

5.2.2 Member Roles and Responsibilities

Another key to effectively managing the cooperative OLE is to put in place a structure that leads to students perceiving that they are bonded to the other members of the group in such a way that success will not be achieved unless the other members succeed (Johnson, Johnson, and Smith 1991). This involves encouraging positive interdependence within the collaborative group. Positive interdependence refers to the notion of dual responsibilities where the students have both the responsibility to learn the material and to ensure that all members of the group learn the assigned material. Two types of positive interdependence pertinent to IT Practice are (Johnson, Johnson, and Smith 1991):

- Positive goal interdependence – where the instructor sets a clear group goal e.g. 'learn the modules content and share your views to support each others learning', to encourage an all for one and one for all mentality and
- Positive role interdependence – where the instructor assigns complementary roles deemed critical to high-quality learning e.g. reader, recorder, checker (of understanding), encourager (of participation), and elaborator (of knowledge).

It is possible to effectively implement positive interdependence with suitable design and implementation in the IT Practice teaching and learning activities. In module 1 students are required to: apply for an advertised job position in UE e.g. multimedia design; write a cover letter; write a resume and prepare a Personal Reflection And Plan (PRAP). Each activity could easily be performed and submitted individually by each student but this would not be meaningful, facilitate community or reflect what is required for a rich learning experience. We can integrate positive goal interdependence by clearly stating that 'the goal of this activity for each student is to apply for an IT position at UE and through a group evaluation process recommend 2 people for the job. It is then possible to use positive role interdependence to facilitate the group evaluation. With 9 students in the group one scenario we consider constructing can be described as follows: (i) Each student submit their application to UE; (ii) In groups of 3 each student must read and comment on each others application and select the most suitable one (with rationale for selection) to report back to the group; (iii) The group would assign a group of 3 to be a panel of interviewers who would construct a series of questions; (iv) The group would assign the selected applicants to be interviewees who must produce a set of answers to the interviewers' questions; (v) the other 3 members are assigned to: 1. Recorder of the understanding i.e. articulate the process of the activity and report to the group; 2. Encourager of the participation i.e. link the interviewees with the interviewers; and 3. Elaborator of knowledge i.e. what was the outcome of the process; (vi) As a group reflect on the process and decide which application

is best suited for the advertised position; (vii) The process can be documented as a set of steps which each member can read as a reflection and rich learning experience exercise.

The instructor needs to consider how to assign member roles and responsibilities. This will be dependent on the students' level of study e.g. undergraduate or postgraduate, the assigned task(s) e.g. allowing for changing or sharing roles and the actual roles to be performed e.g. moderator. In any case the teacher needs to be aware of the distribution of roles and communicate a simple and clear understanding of what is required. In the instance where the collaborative groups are autonomous, the members would organize roles according to the needs of the group with each changing task and stage (Stacey 1999).

5.2.3 Structure and Instructors Role

Students need structure and guidance for online conferencing and discussion with effective online instruction requiring extensive planning and forethought (Bonk and King 1998; Murrery 2000 cited in Bonk, Kirkley, Hara and Dennen 2000). The results of one study where students linked the nature of online discussions and class activity within collaborative groups indicated that clear understanding about the structure of the course, details of how they would be assessed and, what the teacher expected were all contributing factors to their positive learning environment (Gerbic 2005). Thus an instructor cannot expect the groups to manage themselves without appropriate guidance in the first instance. An important distinction needs to be made here between the organization of the discussions facilitated by the instructor and the directive or controlling role that the instructor plays. Moving away from a teacher-centered model and having the instructor play a conversational or informal role allows for more student participation and dialogue. A study of 80 undergraduates using this approach produced higher and more complex levels of student participation and interaction (Ahern, Peck and Laycock 1992 cited in Bonk, Kirkley, Hara and Dennen 2000). In this context the instructors role for managerial actions should be confined to overseeing tasks and the structure of the unit e.g. Announcement tool in DSO for conveying messages to the entire class.

The challenge for university teachers is to increase student engagement with learning and to move from passive to constructivist forms of learning (Gerbic 2005). The UE learning environment and the online discussion activity in IT Practice demonstrate many of the principles of this approach. In addition to structuring the discussion or conference the instructor needs to foster:

- *Support and Encouragement* – Providing socioaffective support is an important element in collaborative online work groups to give the students a sense of belonging and help motivate them to apply themselves to the tasks at hand, especially at times when they are finding their study difficult to manage. This level of support can be given to the students by way of posting supportive comments and sharing personal experiences with them. Evidence suggests that support and encouragement has provided a network of social interaction that inspires the mutual respect and trust required for a successful collaborative group process (Stacey 1999).
- *Student Responsibility and Accountability* – A student's individual writing is his or her means of joining the

knowledge community. In a collaborative setting it is important as a teacher to be conscious and even communicate to the students that it is their responsibility to contribute to the work group, to respect the work group's values and standards, to aid other members and produce the required work on time (Bruffee 1993 cited in Stacey 1999). It is necessary that the instructor understands and is vigilant of effects that can lead to ineffective group efforts e.g. "free-rider effect" where group members expend decreasing amounts of effort and just go through the motions of team work (Johnson, Johnson, and Smith 1991). From a positive viewpoint, in one particular study students having others dependent on them for their contribution to the group made them more responsible for their efforts and deadlines, and such accountability – the results of which have also been observed in IT Practice, was a powerful motivator to study (Stacey 1999). Three suggested ways accountability can be structured and that are applied within the IT Practice OLE include (Johnson, Johnson, and Smith 1991):

- Keeping the size of the group small;
 - Observing each group and recording the frequency with which each member contributes to the groups work;
 - Assign one student in each group the role of checker to report on the group's reasoning for the answers provided.
- *Provision of Group Spaces* – A central point of communication is crucial for collaborative groups to manage the work and administration of the interaction. This is suitably provided by the UE and DSO environment.
 - *Resolution of Concerns or Conflicts* – In order to coordinate efforts to achieve mutual goals it is a requirement that students settle disputes constructively (Johnson, Johnson, and Smith 1991, p. 21). The instructor needs to encourage the groups to resolve any conflicts e.g. contribution to activities or tasks, and act as a mediator where necessary. It is important that the issue is dealt with immediately rather than at a later date e.g. following the assessment.

Using the above mentioned approaches the instructor, after communicating the aims and expectations of the activity, would play a conversational role to allow the students to generate their own understanding and learning experience. The teaching capacity would: monitor the groups' discussion and make comment as required for instance to move them back on track where they may have diverted from the objectives; provide support using positive comments and experiences where difficulties are being experienced with the activity; be vigilant and address for example the 'free-rider effect' and be prompt to resolve any conflicts.

5.2.4 Critical Reflection

"Effective group work is influenced by whether or not groups reflect on i.e. process how well they are functioning". Instigating group processing can attain learning from reflection (Nichol & Blashki 2007). This is defined "as reflecting on a group's session to describe what actions of the members were helpful and unhelpful and to decide what

actions to continue or change" (Johnson, Johnson, and Smith 1991, p. 22). Expectations about the purpose of processing and provision of a structure for processing e.g. list three things your group is doing well today and one thing you could improve, need to be clearly communicated. Group celebration is an important aspect of group processing; feeling successful, appreciated, and respected fosters commitment to learning, enthusiasm about working in collaborative groups, and a sense of self-worth with regard to mastering the subject material together with working collaboratively with colleagues (Johnson, Johnson, and Smith 1991, p. 24). In IT Practice the scenarios described to the student would facilitate critical reflection by providing a process of comparing work and allowing the students to share each other's perspectives regarding the job application. Student responses to studies have exemplified the value of the group for sharing others' perspectives, exchanging ideas, and developing their thoughts in a way that they could not achieve as an individual learning in isolation (Stacey 1999). Thus the tasks set should enable the process of comparing work and allowing the students to share each other's perspectives. Critical reflection plays an essential role for the students to move beyond receiving the transmission of the content and being able to document what was learned. Critical reflection needs to be integrated as part of the design for collaborative online groups. In one particular study discussions facilitated within online groups showed students valued reflection in the sense that it both extended what was done in the class – either by reinforcing theoretical concepts or by continuing the thinking process outside of the class (Gerbic 2005). An online reflective journal for recording for instance: the task; purpose; examples with suitable guidelines e.g. length of contribution; and marking criteria e.g. critical analysis of own and others' views; can help achieve cognitive development (Gerbic 2005).

6. DESIGN OF CURRICULUM AND ASSESSMENT FOR USE IN THE ONLINE COOPERATIVE ENVIRONMENT

The pivotal element of course content follows directly from a perspective of education as changing conceptions: "what changes in understanding do we expect students to undergo as a result of experiencing the course?" (Ramsden 2003, p. 134). Taking this into consideration, the focus of this section is to impart the type of curriculum and assessment that can be designed for use in the cooperative OLE.

6.1 Setting of Aims and Objectives

In structuring course content it is essential to differentiate between the practices students would be expected to perform and how these can be successfully achieved with what they could not do prior to undertaking the course (Ramsden 2003, p. 124). This means the aims and objectives of the unit in relation to online collaborative group work need to be conveyed and received clearly for the benefit of the learning experience to be realized. In this regard the instructor needs to consider the difference in presenting a list of items as part of the outline for teaching with what the students will be expected to learn. To avoid the 'administrative' conception of course design (Ramsden 2003, p. 124) there needs to be a relationship established between the content and the

knowledge and skills gained by the students to show for instance in IT Practice how students can act ethically within their IT profession. Within the IT Practice scenario the cooperative online teaching methods presented aim to: develop students as both independent and collaborative learners; promote critical and creative thinking; and meet the Deakin University Graduate Attribute requirements in relation to preparing students for professional practice. The design of the activities in IT Practice provide the students with the scaffolding to understand the structure of the content, tasks and assessment. The students can then see the relationship between the unit objectives, the learning objectives and how these relate to professional practice. The benefits of using this cooperative approach can be realized if the students can see the added value by enhancing their skill sets and preparing them for the workforce (Leask 2001). Thus a soundly structured course will concentrate on aims for student learning placing a strong emphasis on the link between students and the content to be learned (Ramsden 2003, p. 133).

6.2 Use of E-journals

"The importance of a learning community where ideas are discussed and understanding is enriched is critical to the design of an effective learning environment" (Savery and Duffy 1996, p. 139). This means students first need to engage in the community, second understand what they are learning and third be able to articulate in some tangible way the cognitive development attained within the online cooperative group process. One way to capture this is to use an e-journal. In one particular case journals were posted by students on a weekly basis to a general discussion area, where other students could read them. One of the most valuable aspects for students discovered from an evaluation of this journaling exercise was simply being able to get an appreciation of what their peers were thinking, and how they were going. The students could see that their fellow colleagues were having the same thoughts, questions and concerns (Palmer 2004, p. 6). Similarly participant learning portfolios can be used whereby students are asked to document what and how they are learning in the unit. It needs to be communicated in such a way that students don't think of it as an assessment but rather a process to aid them to understand their strengths, weaknesses, inclinations, and habits as a learner (Brookfield 1995).

The IT Practice scenario can easily employ the use of an e-journal. What each student experiences in the OLE could be further comprehended by asking them to record a summary of what has been learned in the activities of a particular module. Some examples are: How would you describe the collaborative environment in which you had to work?; What was important to be able to work effectively in an online environment?; What tips could you provide for a new student planning to undertake this activity?; What did you like/dislike about the online environment?; Did working in groups enhance your learning experience?

6.3 Motivation for Student Contribution

Assessment implies questioning in a way that demands evidence of understanding, the use of a variety of techniques for discovering what students have learned, and an avoidance of any assessments that require students to rote-learn or

merely to reproduce detail (Ramsden 2003 p. 96). The Australian higher education system encourages independent work compelling students to set their own goals and be self motivated towards their studies (Ballard and Clanchy 1991). This system supports the following three important components of academic learning: 1. skill; knowledge students must acquire, 2. will; factors related to students' motivation to learn and 3. self regulation; ability of students to monitor and control their knowledge and motivation during learning (Phye 1997, p. 65). Considering that motivation for taking a course is one of the fundamental factors which determine how students perform (Felder and Silverman 1988), the implications of these components which can still be perceived as an assumption in theory, must be understood by both the teacher and the student to smooth the progress of the cooperative OLE. This is significant for IT Practice because successful completion of this unit is a core requirement of the course and the learning model is most likely going to be an entirely new experience. This means the motivation towards the study of IT Practice could already be either positively or negatively affected before students enter the OLE.

Factors that may lead to blocking motivation include (Warr, A & O'Neill 2005): production blocking: working in collaboration with others can slow down and even stop the production of ideas. The large number of ideas being posted at any one time may mean a really good idea is overlooked or does not receive the attention it deserves; evaluation apprehension: the inability for a group member to produce ideas because of the fear that their idea will be scrutinized and potentially put down by others. In this way, being overshadowed by other group members can lead to the feeling of exclusion resulting in a laid back approach to learning and loss of motivation; and free riding: also referred to as social loafing, is the result of group members becoming lazy, and relying on other members resulting in a minimal contribution of ideas. An additional perceived limitation of the OLE concept is 'lack of personal touch'. Without having the appropriate support structure in place to foster a students' desire to build a good rapport with his teacher/tutor and get constant feedback, could lead to mechanical learning without further motivation.

Therefore motivational orientation toward a task can be considered a variable in its own right (Amabile 1985). People are said to be intrinsically motivated to engage in a task if they have self-interest in the work at hand and the achievement of that task is not encouraged by reward or acceptance by others. By contrast, people are said to be extrinsically motivated to engage in a task if the work at hand is motivated primarily by external goals (Amabile 1985). Both of these orientations are put into operation in IT Practice. First, self interest is encouraged by students *engaging in real world learning tasks indicative of those experienced in professional practice*. Second, the learning tasks are motivated by external goals because members of the same team are relying on the work of their peers and there is a grade to be achieved.

Cultivating a surface or deep approach to teaching and learning can also be directly linked to student motivation. "Students who adopt a surface approach to learning memorize facts but do not try to fit them into a larger context, and they follow routine solution procedures without

trying to understand their origins and limitations. These students commonly exhibit an extrinsic motivation to learn; I've got to learn this to pass the course, to graduate, to get a good job." (Felder and Brent 2005). Tasks perceived by students as exhibiting this reproducing orientation or are largely extrinsically motivated, increase the likelihood of a surface approach (Entwistle and Ramsden 1983, p. 199). Evidence indicates that the deep approach can be defined in terms of two dimensions: "one relying on personal meaning and interpretation and the other drawing more on previous knowledge, the use of detail and logical argument" (Entwistle and Ramsden 1983, p. 197). The focus and delivery of the learning tasks within the IT Practice OLE facilitate a deep approach to learning by using real life scenarios that are relevant to the students' everyday lives and which simulate professional IT practice. Using Module 1 as the example students need to: work both individually and in a team where they are relied upon by their peers; and engage with and complete real life tasks as directed by real staff members in a modeled 'real world' organization. This provides students with exposure to actual individual and team based business activities of personal relevance to their lives e.g. application for a job at UE assisted by supportive IT Practice teaching staff.

For managing online cooperative learning in IT Practice this means we need to encourage honest and real contributions and be especially careful of being critical (other than being constructive) to avoid low morale and to provide a positive experience. In any situation, assessment criteria needs to be clearly conveyed and even perhaps providing model submissions as to what is expected (Toohey 1999; Palmer 2004, p. 2). For collaborative discussion and group activities some points can be assigned for task completion and timeliness, interacting concisely with others and depth of thought rather than just quantity of posts (Bonk, Kirkley, Hara and Dennen 2000). The assessment in IT Practice is structured with marks allocated for both individual and team contribution. This involves awarding marks based on three levels. At each level the marks awarded indicate the degree to which a student has: level 1 – achieved and demonstrated basic understanding of the modules' activities; level 2 – interacted with the learning objectives and social environment; and level 3 – demonstrated coherent understanding and adequately supported this with real life experiences or examples. In addition some marks are awarded for originality of the contribution and how the student has related their response(s) to their peers and their understanding. Finally marks are awarded for reflection. Particularly we look at how the student was able to adequately reflect on the learning experience and provide a description of what was achieved and the decisions which facilitated this *understanding i.e. how did the student arrive at the endpoint and why was that particular pathway chosen*.

6.4 Importance of Feedback

"A lecturer applying a sophisticated understanding of teaching is aware that every evaluation of a student should be valuable to the student as well as the lecturer" (Ramsden 2003, p. 187). This means students need to be provided with the opportunities to discuss their assignments or assessment tasks. Feedback needs to be provided on a progressive basis

and should contain effective comments to allow the student(s) to improve (Ramsden 2003). For the cooperative online environment feedback can be provided informally within the online discussions and formally at the completion of the assigned activity. In IT Practice feedback is provided in accordance with the activity aims and objectives and in alignment with the student contribution guidelines. Importantly marks are awarded for both individual and group contribution. An example of an excellent job application and mediocre job application are provided to allow the students to self evaluate and reflect on their own work.

7. MY EXPERIENCES: REFLECTIONS ON COOPERATIVE ONLINE TEACHING

Reflection is the hub of the teaching excellence wheel and for new teachers at the tertiary level is key to encourage the development of the skills of reflective practice” (Kane, Sandretto, and Heath 2004, p. 306). In this section I highlight what we have learned through discovering the elements for effective teaching and management of online cooperative work groups as a means of reflective practice.

We confer that the most fundamental metacriterion for judging whether or not good teaching is happening is the extent to which teachers deliberately and systematically attempt to get inside students’ heads and see classrooms and learning from their perspective (Brookfield 1995). In this regard we need to put ourselves in the learners’ shoes and ask questions such as: Would I as a learner gain anything from this? What would I think of it? Did I enjoy it? Have I achieved what I set out to do?

Through this process we have improved our cognitive development towards teaching in tertiary education in the following ways:

- Appreciation and understanding of the cooperative and online teaching theory;
- Ability to apply a conceptual view of the theory to our teaching in IT Practice;
- Thinking about how to present ideas in different ways to support and enhance learner diversity;
- Ability to visualize the relationship between the content and the message to convey; then applying the tools which will achieve a measurable level of effectiveness (albeit tacit knowledge) to meet the students’ learning needs;
- Recognition of the significant difference between a teacher-centered view of content and learner-centered view of content in online cooperative learning;
- Been able to identify with and relate our Apprenticeship perspective of good teaching to the effective management of online collaborative groups; for example as the members of the group mature and become more competent, our role changes by providing less direction and greater responsibility as students progress from dependent learners to independent workers (Pratt and Collins 2006).

8. CONCLUSION

This paper has identified a set of criteria for effectively managing online cooperative work groups. A perspective of how these could be applied was demonstrated for our

teaching in IT Practice. We have discovered that the application of the conceptual framework has been successful for all 5 modules of IT Practice with regard to managing the cooperative OLE.

The focus was not on the technology but rather the process of managing the cooperative OLE. Naturally the technology and associated training to instruct its use play a vital role and the advantages and disadvantages have been explored in depth by other studies into computer mediated communication. Overdependence on technology itself is part of the ‘real world’ experience for this particular application, since if the UE server goes down or a students’ computer fails to work a contingency plan like the one in place in a real organization would need to be enacted.

Implementing learner diversity for online cooperative groups first requires assessing the needs of learners so that they can grow in their development. Positive interdependence plays a significant role in the management of these groups when students are undertaking online activities. When selecting content and teaching methods we need to include a range of group and individual tasks in the assessment where students are required to work with others, consider the perspectives of their peers, and compare them with their own perspectives. The effectiveness of this can be measured as part of the assessment. The next step is to undertake a survey to understand the students’ point of view about the OLE including its learning benefits and what strategy can be put in place to improve the learning experiences for the students. For example to deal with the drawback of lack of personal touch associated with the cooperative OLE, we are currently trialing the use of a synchronous communications tool called Elluminate Live (elive) which applies audio, video, chat and white board tools to simulate teacher and student interaction in a virtual face-to-face setting. The survey would be designed to measure student experiences in line with the criteria of the conceptual framework to justify its use. Once refined and validated it is anticipated to be applied to other courses within the Faculty. The idea of performing an investigative study to determine the situation of teaching and learning using the cooperative OLE on an international or global scale is also being considered for future work.

9. REFERENCES

- Amabile, T.M. (1985), “Motivation and Creativity: Effects of Motivational Orientation on Creative Writers.” *Journal of Personality and Social Psychology*, Vol. 48, No. 2, pp. 393-399
- Ballard, B & Clanchy, J. (1991), ‘The cultures of learning’, Teaching students from overseas: a brief guide for lecturers and supervisors, Longman Cheshire, Melbourne, pp.10-27
- Bonk, C.J., Kirkley, J., Hara, N. & Dennen, V., (2000), “Advances in Pedagogy: Finding the Instructor in Post-Secondary Online Learning.” [Online], paper presented at the annual meeting of the American Educational Research Association, New Orleans, LA. Available from: www.indiana.edu/~bobweb/temp/online_ped.pdf [July 5 2006].
- Blashki, K & Nichol, S (2005), “Games Geek Goss: Linguistic Creativity in Young Males”. *Australian Journal*

- of *Emerging Technology and Society*, Vol. 3, No. 1, pp. 71-80.
- Brookfield, S.D. (1995), *Becoming a Critically Reflective Teacher*. Jossey-Bass, San Francisco.
- Coldwell, J. (2006), Overview of SIT301 IT Practice, [Online], Deakin University. Available from: <http://www.deakin.edu.au/dso> [July 2 2006].
- Cooper, J., and Robinson, P. (1998), "Small group instruction in science, mathematics, engineering, and technology." *Journal of College Science Teaching* Vol. 27. Deakin University. (2007), What is DSO? [Online], Institute of teaching and Learning. Available from: <http://www.deakin.edu.au/itl/dso/tools/index.php> [July 2 2006].
- Entwistle, N. and Ramsden, P. (1983), *Understanding Student Learning*. Nicholas Publishing Company, New York.
- Felder, R. M. & Brent, R. (2005), "Understanding Student Differences". *Journal of Engineering Education*, Vol. 94, No. 1, pp. 57-72
- Felder, R. M. & Silverman, L. K. (1988), "Learning and Teaching Styles in Engineering Education". *Journal of Engineering Education*, Vol. 78, No. 1, pp. 674-681
- Garrison, D. R. & Anderson, T (2003), *Community of Inquiry, E-learning in the 21st Century: A Framework for Research and Practice*. Routledge Falmer, London.
- Gerbic, P. (2005), "Renegotiating the pedagogical peace: a case study in online discussions for undergraduate on campus students". Proceedings of Research in Distance Education Conference, Deakin University, Geelong, pp. 48-58.
- Grundy, S. (2005), An interview with Shirley Grundy, EEE713 Teaching in Tertiary Education, audio transcription, Learning Services, Deakin University.
- Johnson, D.W., Johnson, R.T. & Smith, K.A. (1991), *Cooperative learning: Increasing College Faculty Instructional Productivity*, ASHE-ERIC Higher Education Report Number 4. School of Education and Human Development, The George Washington University, Washington, D.C., pp. 15-25.
- Kane, R. Sandretto, S. and Heath, C. (2004), "An investigation into excellent tertiary teaching: Emphasising reflective practice". *Journal of Higher Education*, Vol. 47, No. 3, pp. 283-310.
- Leask, B. (2001), "Bridging the gap: internationalizing university curricula". *Journal of Studies in International Education*, Vol. 5, No. 2, pp. 100-15.
- Mccrindle, M. (2003), *Understanding Generation Y*, [Online], The Australian Leadership Foundation. Available from: <http://www.learningtolearn.sa.edu.au/Colleagues/files/links/UnderstandingGenY.pdf#search=%22understanding%20generation%20Y%20McCrindle%22> [August 30 2006].
- McKeachie, W. J. (2002), 'How to make lectures more effective', *Teaching Tips: strategies, research and theory for college and university teachers*, 11th edn. Houghton Mifflin, Boston.
- McShane, K (2004), "Integrating face-to-face and online teaching: academics' role concept and teaching choices". *Journal of Teaching in Higher Education*, Vol. 9, No. 1, pp. 3-16.
- Mousley, J. (2005), An interview with Judy Mousley, EEE713 Teaching in Tertiary Education, audio transcription, Learning Services, Deakin University.
- Myers, J., 1991, "Cooperative learning in heterogeneous classes", *Cooperative Learning*, Vol. 11, No.4, July.
- Nichol, S. and Blashki, K. (2005), "The Realm Of The Game Geek: Supporting Creativity In An Online Community". Proceedings of International Conference on Web Based Communities, IADIS, San Sebastian, pp. 246-52.
- Nichol, S. & Blashki, K. (2006a), "Enhancing Electronic Learning for Generation Y Games Geeks". In DN Kick (ed.), *Advances in e-Collaboration Series*, Idea Group, Texas, USA, in press.
- Nichol, S. and Blashki, K. (2006b), "Games Geeks in Context: Developing the Environment to Engage Creative Expression". Proceedings of ED-MEDIA: World Conference on Educational Multimedia, Hypermedia and Telecommunications, Association for the Advancement of Computing in Education, Orlando, Florida, pp. 1298-1303.
- Nichol, S. and Blashki, K. (2007), "Enhancing Creativity with Collaborative Learning and Purpose Built Environments". *Journal of Advanced Technology for Learning: Special Issue on Collaborative Learning*, in press.
- Palmer, S. (2005), An interview with Stuart Palmer, EEE713 Teaching in Tertiary Education, audio transcription, Learning Services, Deakin University.
- Palmer, G., Peters, R., and Streetman, R. (2007), *Cooperative Learning*, [Online], Department of Educational Psychology and Instructional Technology, University of Georgia. Available from: http://projects.coe.uga.edu/epltt/index.php?title=Cooperative_Learning [29 August 2007].
- Pratt, D. and Collins, J. (2006), *Teaching Perspectives Inventory (TPI) Summary of Five Perspectives on 'Good Teaching'*, [Online]. Available from: http://www.one45.com/teachingperspectives/tpi_html/tpi_summaries.htm [3 July 2006].
- Phye, G. (1997), *The Handbook of Academic Learning Construction of Knowledge*. Academic Press, London.
- Ramsden P. (2003), *Learning to Teach in Higher Education*, 2nd Ed. RoutledgeFalmer, London and New York.
- Rockwood, H. S. (1995a). "Cooperative and collaborative learning" *The national teaching & learning forum*, Vol. 4 No. 6, pp. 8-9.
- Rockwood, H. S. (1995b). "Cooperative and collaborative learning" *The national teaching & learning forum*, Vol. 5 No. 1, pp. 8-10.
- Rosenburg, J. (2005), An interview with John Rosenburg, EEE713 Teaching in Tertiary Education, audio transcription, Learning Services, Deakin University.
- Rourke, L., & Anderson, T., (2002), "Using peer teams to lead online discussions". *Journal of Interactive Media in Education*, Vol. 1, pp.1-21.
- Savery, J. R. and Duffy, T. M. (1996), *Problem based learning: An instructional model and its constructivist framework*. In B. Wilson (Ed.), *Constructivist Learning Environments: case studies in instructional design*, Educational Technology Publications, New Jersey, pp. 135-148.
- Salmon, G., (2000), *E-Moderating: The Key to Teaching and Learning Online*, Kogan Page, London.

- Smith, B. L., and MacGregor, J. T. (1992), What is collaborative learning? In Goodsell, A. S., Maher, M. R., and Tinto, V., Eds. (1992), *Collaborative Learning: A Sourcebook for Higher Education*. National Center on Postsecondary Teaching, Learning, & Assessment, Syracuse University.
- Stacey, E., (1999), "Collaborative learning in an online environment". *Journal of Distance Education*, Vol. 14, No. 2, pp. 14-33.
- Toohy, S (1999), "Beliefs, values and ideologies in course design", *Designing courses for higher education*. *Journal of Higher Education*, Vol. 41, No. 3, pp. 343-344.
- Warr, A. and O'Neill, E. (2005), "Understanding Design as a Social Creative Process". *Proceedings of the 5th Conference on Creativity and Cognition*, London, UK, pp. 118-127.

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ISSN 1055-3096