Redesign Subject to Support Group Work in Distance Education

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ABSTRACT

This paper is about a distance education subject redesign undertaken in School of Information Studies at Charles Sturt University. This paper presents a theoretical framework supporting a constructive alignment in subject redesign grounded on some valuable learning theories, namely social constructivism, cooperative learning and collaborative learning. The theoretical framework guided the redesign of a postgraduate subject INF441 Information Management in Organizations. In the subject redesign, constructive alignment for learning environment, intended learning outcomes, teaching and learning activities and assessment tasks were carefully checked. The paper reports the effects of the subject learning design after the subject was subsequently taught by the same designer in the role of a subject coordinator/lecturer. Group work tools in CSU Interact (a learning management system using Sakai) were able to create an appropriate learning environment for the successful running of the subject. The subject redesign created an effective beneficial learning environment in the presence of the affordance of the learning management system 'CSU Interact'.

Keywords: Group work, Distance education, Subject Redesign, Educational Technology.

INTRODUCTION

This paper particularly focuses on a redesign of a postgraduate subject 'INF441 Information Management in Organizations'. A head of school (HOS) in School of Information Studies (SIS) who was a former subject coordinator of it spoke to a new subject coordinator about conducting a postgraduate subject peer-review and its subsequent subject redesign. This postgraduate subject was a core subject in the Master of Information Architecture (MIA) and an elective in the final year subjects in Master of Applied Science (Library and Information Management) [MAS(LIM)] program. The past students in the subject complained that very highly librarian-focused study materials were used when these students would actually expect to be employed in information centers or information resource organizations with leadership or managerial roles after their graduations. As there were generally more students from the MIA program than the MAS(LIM) enrolled in the subject, the information management and knowledge management components of the

subject were to be made much less librarian-focused, but more industrial-focused in a subject redesign in order to suit the particular student cohort.

In the same school, there was another undergraduate subject with very highly similar contents offered to Bachelor of Applied Science (Library and Information Management) [BAS(LIM)] students. All MAS(LIM) postgraduate students and BAS(LIM) undergraduate students who graduate from the programs would be granted an Australian Library and Information Association (ALIA) accredited librarian membership. In common, the two subjects clearly needed the librarian-focused study resources. As such, the HOS requested both the new MIA/MAS(LIM) subject coordinator and the BAS(LIM) subject coordinator to collaboratively review, discuss and redesign their subjects together. They were also assigned the subject coordination and teaching roles after the redesign. Being mindful of the different subject requirements and how the different requirements could affect the subject redesign and development, the two subject coordinators gathered different study resources and worked out different learning activities to suit the diverse needs of their own student cohorts. They helped and shared some common resources with each other. There were several types of frequent discussions e.g. on different learning objectives, assessments, group work learning, practice based learning, learning activities and learning environment issues in the subject redesign. They individually conducted a constructive alignment that considers the needs for the diverse cohorts. Both the subjects were redesigned with a rationale of how the subject could be constructively aligned with the learning objectives, group activities and assessments in the learning environment for the needs of different student cohorts. These tasks were paramount in the subject redesign. They discussed how the disparate types of learners could grasp the theoretical learning concepts and apply them in class activities and group work. The use of group work assessments was selected due to the student would become the future librarians and information resource staff and would need to work cooperatively with co-workers. They would need to interact with all types of stakeholders in a library. The same applied to many of the postgraduate students as prospective information center/resource managers.

During the session, the students made use of the study resources, took part in the learning activities, engaged in group activities and completed two assessments which were group work. Most of them enjoyed they group work tasks though a few students left the subjects and their groups. The students who completed the subject enjoyed the subjects. They commended their subject coordinators and left in group work forum messages about how much they enjoyed their group work and times spent in the subjects.

This paper is structured as follows. The next section is a literature review. It discusses the learning theory, learning design principles and considerations that support the postgraduate subject redesign. A section on methodology follows. The section afterwards reports the findings of the study. A subsequent section on discussion reflects on the implication of this study. The final section provides a conclusion.

LITERATURE REVIEW

The common terms educational design, subject design, learning design and instructional design are used interchangeably (Rogers & Graham, 2008; Pelham et al., 2008). The terms directly relate to a subject design or subject redesign. This literature review explores literature in educational design using principles and guidelines of various learning theories. The learning theories have a common theme supporting constructivism and constructivist learning design (Jonassen, 1999; Gagnon & Collay, 2006). Together, the learning theories present a theoretical framework that supports an educational design that facilitates constructivist learning. Using this framework, it guides the subject redesign. The theoretical framework highlights that the teachers and students can participate in teaching and learning activities aligned with intended learning outcomes in a monitored environment for collaborative group assessment tasks.

Constructive Alignment

A subject redesign involves making changes. Theories of education and theories of change need the support of each other (Fullan, 1993). Biggs and Tang (2007) explain reflective teaching happens whereby 'expert teachers continually reflect on how they might teach even better' (p.41) but transformative reflection 'uses theory to enable the transformation from the unsatisfactory what-is to the more effective what-might-be' (p.43). Constructive alignment also aims to facilitate constructivist learning on the premise of constructivism. Social constructivism emphasizes the needs for students to learn and gain knowledge of a subject through interactive learning activities like group work.

Learning Theories

Learning has always been the subject of research by psychologists and educators resulting in many theories of learning (Tusting & Barton, 2003; Forehand, 2005; Collinsa, Josephb & Bielaczycc, 2004; Howard, Carver & Lane, 1996; Biggs, 1996; Seongheea & Boryungh, 2008). The above-mentioned researchers who explore learning theories commonly view that teachers play an important role in creating a learning climate or learning environment to encourage and facilitate active learning and teachers also reflect, learn and make teaching improvements based on their teaching experience. Kolb learning cycle (Kolb, 1984; Howard, Carver, & Lane, 1996) suggests to adopt a reflective practice which is important to the development of teaching using teachers' own experience, so that teaching can facilitate student learning. Reflection has been widely recognized as a central tenet in an effective teacher education program (Wang, Chen & Levy, 2010). This research adopts and endorses a few learning theories below.

Social Constructivism

Constructive alignment is grounded on constructivism which aims is to facilitate constructivist learning.

Constructivism is a philosophical view on how we come to understand or know (Savery & Duffy, 1996, p.135). Barab and Duffy (1998) comment that amongst the constructivists, they hold different perspectives and make different assumptions. Mayer (2004) argues that constructivism takes many forms. Piaget's constructivism (Leonard, Noh and Orey, 2007) is about what is learned and organized as mental representations of something tangible or intangible that can be applied to an object, situation or event. Cognitive constructivism sees that learners play an active role in assimilating objective knowledge in constructing new models by engaging in new experiences in active learning process (Tusting & Barton, 2003). Social constructivism, developed by Vygotsky in his activity theory (Chaiklin, Hedegaard & Jensen, 1999), is crucial for learning as it allows a different perspective through the interaction with other people and cultural artefacts (Berger & Luckmann, 1966; Loughland & Parkes, 2004). Engestrom (1987) articulate a computer-mediated communication or computer-mediated collaboration (CMC) model where technology is used as the artefacts in educational technology.

Nevertheless, constructivism has a basic premise that learning is an active process, in which learners actively seek to construct coherent and organized knowledge. Social constructivism critically means a need for social interaction amongst members in a same learning and teaching community to collectively construct the coherent knowledge. To construct collective knowledge, it is critical to encourage and facilitate collaborative learning and cooperative learning.

Collaborative Learning and Cooperative Learning

Bruffee (1995) clarifies that collaborative learning and cooperative learning are two versions of the same thing. The traditional form of collaborative learning is face-to-face group work (Ellis, 2001). Collaborative learning is an important pedagogy in higher education which restructures the traditional classroom lecture into small group work with intensive interactions between students and teachers for complex projects (Cabrera et al., 2002). Collaborative learning allows group members (learners) to analyze and interpret meanings as it unfolds the data at the group level (Dennen & Paulus, 2005). The modern world reaches out beyond the face-to-face collaborative or cooperative learning with the affordance of technology (Suthers, 2005; Teo & Gay, 2006). Dennen and Paulus (2005) further discuss computer-supported collaborative learning in Internet-based distance education. Cabrera et al (2002) remark that cooperative learning connects knowing, cooperative problem solving and socially based knowledge. Ledlow (1999) and Panitz (2000) explain that cooperative learning requires students to form groups and work on an assignment together formally in which teachers carefully design lessons and activities suitable for use. Cooperative learning allows students to work together (Jacobson, Davis & Licklider, 1998) to accomplish shared learning goals (Johnson, Johnson and Stanne, 2000). Computer-mediated collaboration is well adopted in education and training (Salmon, 2000). CMC offers the affordance of online socializing and networking (Salmon, 2000), i.e., technology creates the opportunity for social interaction in learning and teaching (Gabriel, 2004; Fullan, 1993). Educational technology like learning management systems (e.g. Blackboard, WebCT, Sakia, Moodle) are well adopted in the modern world (Grace & Butler, 2005; O'Neil, Singh & O'Donoghue, 2004). Sharples (2000) and McLoughlin and

Lee (2007) discusses the use of mobile educational technology such as personal handheld or wearable computer systems and social software that support learning from any location. In essence, the researchers above hold highly similar views about people can interact collaboratively with work cooperation in different learning projects to accomplish tasks and achieve common goals.

Having explored a constructive alignment articulated through a theoretical framework of social constructivism back up with collaborative learning and cooperative learning, the subject redesign needs to adopt a methodology. The methodology will follow the direction of using the constructive alignment supported by the theoretical framework.

METHODOLOGY

To redesign the subject INF441 Information Management in Organizations, a methodology is formulated by aligning the subject's intended learning outcomes, teaching and learning activities, assessment and learning environment created for its distance education learners within the theoretical framework. It will be discussed below. The subject involved distant education students from the Master of Information Architecture [MIA] and Master of Applied Science (Library and Information Management) [MAS(LIM)] programs. Many students were students who were located in different parts of the world. Some were domestic Australian students.

Constructivist Learning and Constructive Alignment

It was planned that at the start of the teaching session, the students would be formed into groups by the postgraduate subject coordinator. Each group would be assigned a project site (online Sakai group work sites through CSU Interact) where all group members could interact together using communication tools like 'announcement', 'group emails', 'chat room' and 'forum'. They were given planning tools like 'calendar' to set timelines and meeting arrangements. They would also be provided with group work with collaboration tools like 'wikis' as well as 'resource' to add and share common work together (Okamoto, Kayama & Inoue, 2002).

In the learning modules, students would be encouraged to interact amongst the members in the group project site based on questions in the modules. Students would be taught how to use the tools and would be clearly provided with instructions to learn the tools at the start of the session. The subject coordinator would also facilitate the first few chat room meetings in groups and check the communication or progress patterns of all groups in the early weeks in the session. Teacher-learner interactions would need to be well maintained throughout the session to ensure effective learning continuously happened and group work would be steered into some fruitful directions.

Intended Learning Outcomes (ILO)

The subject has six ILO or learning objectives 1. Discuss the use of information in strategic management; 2. Outline information resources and processes in an organization; 3. Outline the key concepts underlying knowledge management; 3. Describe ways of establishing corporate information needs; 4. Explain methods of evaluating corporate information resources; 5. Assist in the development of a corporate information policy; and 6. Apply the above outcomes to a variety of information-related positions. These objectives are in alignment with CSU graduate attributes. The subject intended learning outcomes fulfils seven principles of good practice in education (Chicking & Gamson, 1987, Graham et al., 2001). In the subject delivery, it must be checked that there were frequent interaction between faculty members and learners, adequate cooperation amongst students, prompt feedback to all members, and clear communication of expectations. The subject coordinator must ensure that the whole class respected diverse talents and opinions of others. Learning would be well-supported by collaborative learning and cooperative learning. It was planned with an expectation that constructivist learning would be a form of active learning allowing each individual learner and the group workers to work towards the completion of all assessment tasks and learning activities.

Teaching and Learning Activities (TLA)

The importance of technology used in supporting education from a pedagogical point of view has been highlighted in different literature. Marra, Moore and Klimczak (2004), and Dennen and Paulus (2005) discuss the use of online forums in learning and teaching. Schellens and Valcke (2006) and Schellens, et al. (2005) focus on collaborative learning in asynchronous discussion groups which possibly links to enhancement of academic discourse and knowledge construction. The subject coordinator considered the use of CSU Interact tools like 'resource' as a multimedia reading material repository in the subject redesign to enhance interactive learning (Kennedy, Petrovic & Keppell, 1998; Kennedy, 2004; Mayer, 2001 & 2005) as well as resourced-based learning (Hill & Hannafin, 2001). To enable the discussions of various topic readings amongst students, forum discussions and chat room would be used. The use of covered readings and group forum discussions on their project sites will help achieve the learning outcome 'the use of information in strategic management, information resources, information audit, information/knowledge policy, key concepts underlying knowledge management, corporate information needs, and all organizational information related issues'. By discussing the topic readings in groups, students could establish corporate information needs, query the readings or seek to clear doubts in subject contents. Students could share information resources and discuss organizational work processes on the project site. The student group activities were aligned with the six intended learning objectives.

Assessments

There were two assessments in the subject involving group work. The first assignment was grounded on problem-based learning that anchors the learning process in real-world or

simulated cases (Hannafin & Land 2000; Savery & Duffy, 1996;). Assignment 1 was planned to involve students in a lot of group interaction to edit a group report using wikis on the group project websites in CSU Interact. Assignment 1 would test the students on their application of subject knowledge in a practiced-based case study. Group members identified their case in terms of user information/knowledge needs, information audit strategies, information resources required in the case, information policy, strategic management practices, and all subject related issues in their learning activities. The second assignment made use of their learning knowledge to perform annotated bibliographies. In assignment 2, all group members were required to not repeat the bibliographies used by any other members in the same group through their group interactions. As all students in all groups were distance education learners, all interaction, communications, activities and assessment tasks were done electronically.

Learning Environments

In the subject website (through Interact), tools like ‘announcement’, ‘chat rooms’, ‘casts evaluation’, ‘forum’, ‘module’, ‘resource’, ‘subject outline’ and ‘wiki’ were used. The subject redesign strategies made the ILOs explicit to the students which enable them to demonstrate to the teacher and their peers what they learned (Mann, 2004). As Kotzinos et al. (2005) and Karpova, Correia and Baran (2009) discussed, online learning allowed students, like the INF441 learners, to share resources, communicate messages to their group and teacher, integrate their learning into the individual contribution in group tasks on project website wikis and help each other in editing their completed tasks. They could share and enjoy their achievements in each group. The subject redesign fulfils its ILOs with its TLAs, and assessments are put in place in the learning environment. In both the subject and group project websites, ‘home’, ‘site info’ and ‘help’ options would provide the students with options to adjust their project site environment or seek help information about the use of each tool. In distance education where the INF441 students were required to collaborate for group assessment purposes, CSU Interact group project websites design and set up to facilitate these TLAs and assessments task to achieve the ILOs.

The subject was taught by the head of school before the redesign took place in a final session of a year. It was redesigned with the HOS’s direction and guidelines. The subject was taught as a redesigned subject in the first session the next year with an initial subject enrolment of up to 36 students. The number later dropped to 29 students after the university census date. The students were contacted by an educational designer in SIS for a separate distance education group assignment experience survey at the end of the session. Apart from observation, subject site and project sites documentations, the survey provided further data for analysis of the success of the redesigned subject and the student experiences.

DISCUSSIONS

The subject was delivered successfully as the way it was planned in the methodology section. In conducting this subject, the subject coordinator/lecturer closely monitored all group work, the student communication, frequencies of interaction, scheduling, individual

task performance and group assessment completions. In the group project websites, it was found that tools like ‘announcements’, ‘calendar’, ‘chat room’, ‘group email’, ‘resource’, ‘wiki’ and ‘forum’ were well used by all groups. The subject coordinator/lecturer visited all project sites to check shared resources used, whether they used group emails, how they responded to forum/ chat room questions and their email enquiries, having the authority as a project site manager, and stepped in when any groups needed help and support.

While declarative knowledge was provided to students through the resources and modules developed in INF441 subject Interact website, it was found that their functioning knowledge was a gained through learning experience in self-centered self-directed learning, as well as group work learning. All students access a subject forum and a chat room to interact in the subject CSU Interact website. They could also access their group project sites created to help them share and communicate their learned declarative amongst the group members. As in Figure 1, the students’ group knowledge was used to produce their wiki assessment report with fulfilments of the six learning outcomes. It was observed that their collective functioning knowledge was applied in their group learning activities and group work assessment tasks. Their project sites showed that chat rooms, announcements and group emails were best utilized. Few groups with members who used high-end broadband Internet also used SKYPE for video chats. Students demonstrated their application of subject knowledge in their practiced based assessment and learning activities.

Figure 1: An Example of Wiki on a Project Site.

In the group work assessment reports on wikis, all groups provided a required section with their comments on group work progress and achievement. Surprisingly, all students reported positive learning experiences. It was discovered that Interact tools like ‘chat rooms’, ‘forums’, ‘group emails’, and ‘announcements’ help support collaboration learning or and cooperation learning by enabling in-depth discussion, brainstorming, prompt group member feedbacks and faculty-members-learners interactions for teacher feedbacks.

Expectations of tasks were communicated over teacher-learner interactions in group emails, chat room and during consultation hours where students phoned the teacher. Calendar were scheduled with meeting appointments and beeping alarms that alerted the students and resultantly facilitated on time task completions. The 'resource' tool was helpful in groups where members shared their group task related resources. The Saika's ability of generating project websites in CSU Interact enabled online group work. It helped achieve the ILOs by enabling the group interaction driven TLAs, facilitating the group work assessment tasks and providing the required interactive active learning environments.

On a whole, the students were provided with prompt feedbacks, guidance and support throughout entire teaching session in the redesigned subject. It is observed that many MAS (LIM) students found it hard to follow the text as it had more real-world information organization examples not in the library settings. In contrast, the MIA students enjoyed the text and all readings. Reading resources, especially the multimedia resources were highly commended on. It was observed that some MAS (LIM) students also could not understand some organizational issues as much as MIA students in the assessment task specification sheet. It was found that a few students did not like the second assessment on annotated bibliography, seeing it a waste of time as a higher education literacy test. As many student queries were answered in group project emails and as emails to the subject coordinator's/lecturer's work email account, the forum on the subject website appeared to have minimal forum activity. When questioned whether all groups had done well in their group work, a student pointed out that group work could be difficult if group members had different ways to undertake tasks or simply did not get on well. Cultural and language differences in learning (Melles, 2004) were also brought up as an issue. As close monitoring of class happened with the teacher facilitation throughout the teaching session, no group reported any dispute or disagreement throughout the entire session. Due to the facts that the second assessment involved group interaction but was submitted as an individual assessment, the members in group scored different total marks in the subjects.

RESULTS

Nevertheless, the redesign subject encouraged collaborative learning and cooperation learning in group interaction and co-working together. It allowed the construction of individual and collective group declarative and functioning knowledge. Using the combined collective group functioning knowledge (Zack, 1999), all members resolved the practiced based problem in their selected case study. Students were highly satisfied in this their learning, activities and assessments in this subject. The online evaluation results of core items were rated 5.41 on a 7 Likert scale by the overseas student cohort with 67% of responses and rated 5.56 by the domestic student cohort with 50% of responses. Using the feedbacks from an end of session online evaluation survey and a required section from all groups reporting their progress and achievement in group reports, Table 1 is developed.

There was no clear difference between the pace of learning and significant result difference between the MIA and MAS(LIM) students. Both the overseas and domestic student cohorts in general performed well and were satisfied. There was no failure occurred in this subject. In reflection, the distance education student challenges (student culture, country

and time zone differences) have to be taken into account in a subject minor revision if the subject was to be conducted again. The revision would also need to consider making improvement for all group members understand the need for practiced-based learning before each member embarks on the task.

Table 1. Student Feedbacks on their Experience of Group Assessments

Category	Feedbacks
Sharing real life experience	• I enjoy sharing the group member knowledge and experience in this real life case study that relates directly to a real world problem. • My members have expertise that I get an opportunity to learn from them. It has been a great learning experience.
Ability to use technology supporting their collaboration	• It appeared worrying for me to use wikis and tools in the group project site at the beginning of our group work. As soon as I learnt and used it well, I was so glad to have developed this ability. • The assessment tasks in this subject were very well designed. They allowed students to communicate and use Web 2.0 technology for real activities. The annotated bibliography taught me to read critically. • Working in a group project and discovering the benefits and pitfalls of preparing a joint report was interesting. I enjoyed meeting my group online and working with them.
Group work experience	• For my team who live in various countries, we overcome the time and location difference to have worked collaboratively together. It was a rather different experience. • Working in a group project and discovering the benefits and pitfalls of preparing a joint report was interesting. I enjoyed meeting my group online and working with them.
Overall subject experience	• Questions to the lecturer were answered promptly as well as online forums that outlined questions that others had asked. This was very helpful. • Online resources were helpful. • Group assignment was helpful in facilitating communication with students • The first assignment is good exercise to think how I could improve my organization. • I enjoyed the group work for the first assessment item. A large choice of readings was given. • The group assessment task was a helpful learning experience. I'm glad I did it.

CONCLUSIONS

Constructive alignment adopted in the subject redesign has provided some effective teaching and learning outcomes. In the subject redesign, setting a group work project site using the affordance of educational technology actually helps facilitate individual and collective (group) knowledge construction. With the practiced-based learning assessments used in the subject redesign, functioning knowledge of students were collectively assessed. The paper explains a theoretical framework which strongly supports the constructive

alignment of ILOs, TLAs, assessment tasks and learning environment creations. The learning environments encourage and facilitate collaborative learning and cooperative learning.

While group work is a graduate attribute and employer preference in graduates, doing group work together could be a nightmare to some students. Group work and group participations in an online learning environment poses different challenges when students in the face-to-face world dread this idea. However, the running of the redesigned subject prove it supports distance education group work as group assessment tasks in the presence of (or affordance of) educational technology.

On a whole, this paper reports a successful innovative learning and teaching owing to the subject redesign using an enabling educational technology of CSU Interact. This paper reports that educational technology clearly supports group work in distance education.

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