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A Learning Cycle for E-Commerce Courses: the case of ELCM 211

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Abstract
While many areas of e-commerce have attracted extensive research efforts, little has been explored on educational and pedagogical challenges in this field. This paper describes the development, implementation and evaluation of a learning cycle for e-commerce courses. The paper concludes with a summary of findings and implications for the future design of similar courses.

Keywords: E-commerce, Teaching, Learning Cycle, Active Learning, Course Design

Introduction
During the past 30 years, developments of theories on education have been focusing on constructive learning approaches (Dryden and Vos, 1993; Bridges, 1994; Hood, 1998; Atkin, 1999). While constructivist views of learning have developed significantly in theory, changes in practice have been less evident (Cuban, 1984; Darling-Hammond, 1997; Hood, 1998). Due to large number of students, cost effectiveness, and scalability most universities are still delivering content in the traditional lecture theatre environment through a one-way transmission knowledge model (Millis and Cotell, 1998; Ramsden, 2003). However, universities are being challenged to adopt new learning approaches as well as increase student engagement and learning (Bridges, 1994; Mayer, 1999; Brown, 2000; Brown, 2005).

In order to respond to those challenges, the School of Information Management (SIM) at Victoria University of Wellington, New Zealand, has developed a new learning approach for its introductory electronic commerce course (ELCM211). A sequence of constructivist based learning strategies have been integrated into a new learning cycle based on three interrelated theories: experiential learning (Smith, 2001), active learning (Cameron, 1999; Felder, 2005), co-operative learning (Millis and Cotell, 1998; Felder, 2005). While many areas of e-commerce have attracted extensive research efforts, little has been explored on educational and pedagogical challenges in this field (Wareham et al., 2005; Scornavacca et al., 2006).

This paper describes the development, implementation and evaluation of a new learning cycle for e-commerce courses. The following section presents a brief review of literature into constructivist teaching approaches that underpin the design of the learning cycle and its strategies. This is followed by a description of the development of the e-commerce learning cycle as well as the case of ELCM211. The results of the evaluation are then summarized before key findings and implications for the future design of similar courses are presented.

Theoretical Background
Not surprisingly, a search on major bibliographic databases resulted in only few academic articles relevant to e-commerce courses at the tertiary level (Gricar et al., 2004). On the other hand, the extensive literature on constructivist approaches to learning provides a good foundation for the development of a new learning approach for e-commerce courses (Kolb,
The current literature suggests that combining experiential, active, and co-operative learning activities is a powerful way to increase students engagement, understanding and learning outcomes (Parker and Swatman, 2001; Gricar et al., 2004; Felder, 2005). Let’s consider each of these learning approaches:

**Experiential learning** - Experiential learning can be understood as a way of learning through self-experience and the participation of learners (Greenway, 2004). It aims to engage learners with the phenomena being studied (Smith, 2001). Additionally, it involves learners with pragmatic examples and abstract concepts that are often supported with practical cases. As a result, learners often reflect their personal experiences in combination with new theories (Greenway, 2004). Less contrived forms of experiential learning are generally described as 'learning from experience' or 'learning through experience' (Greenway, 2004).

**Active learning** - Similar to experiential learning, active learning also involves students in the learning process. However, active learning put emphasis on the pro-active involvement of students into the learning process (Cameron, 1999; Wells, 2005). Learners are often confronted with real life situations that are introduced to smaller groups. The active learning environment aims to facilitate problem solving, decision making, and reflective thinking (Cameron, 1999; Wells, 2005). Thereby, learning should not be perceived as a “spectator sport” and learners should develop critical- and creative-thinking skills (Cameron, 1999). Particularly active contributions from learners intend to present learners with “real-life” solutions related to their own experiences (Cameron, 1999).

**Co-operative learning** - Co-operative learning involves students working in teams (Felder, 2005). In the co-operative learning environment, the educational process is often a joint intellectual effort of students and teachers - searching for understandings and solutions to problems (Millis and Cottell, 1998). Similarly to experiential and active learning, co-operative learning provides opportunities for students to work collaboratively to solve problems supported by their own personal experiences (Millis and Cottell, 1998).

In addition to the combination of the three learning approaches abovementioned, the literature often argues that the likelihood of learning success increases when utilizing well structured learning cycles (Kolb, 1984; Cameron, 1999; Marshall, 2004a; Marshall, 2004b; Lorsbach, 2005; Pickles, 2005). Such learning cycles often consist of multiple learning stages and may include a number of different components including active experiments, reflections, reviews, and practical exercises (Greenway, 2004). Marshall’s (2004b) academic development framework suggests that students learn more effectively when they move through a series of experiential learning cycles that engage them in the educational objectives of the course.

**A Learning Cycle for E-Commerce - The Case of ELCM 211**

Concurrent with the evolution of the e-commerce phenomenon as an academic discipline, the School of Information Management at Victoria University of Wellington has offered a major in electronic commerce since 2001. The foundation course for the major was ELCM201 - Foundations of Electronic Commerce. The course provided an overview of the impact of new technologies on commercial paradigms and practices. It also presented students with current principles, theories, technologies, and applications of e-commerce.
ELCM201 content was delivered through a mix of traditional lectures and practical workshops in computer laboratories. The managerial course content was mainly delivered through course readings and within lectures. In contrast, the practical workshops concentrated on the web-development assignments in which tutors were available to support students with their assignments.

In early 2005, the School of Information Management was restructuring the curriculum for its undergraduate information systems and e-commerce majors. One important objective of this exercise was the establishment of a clearer division between courses with a strong technical content and those with a strong managerial content. Therefore, students would be able to follow two possible streams – managerial and/or technical.

As a result, the course content of the ELCM201 (mix of managerial and technical content) was changed and a new e-commerce introductory course (ELCM211) with a strong managerial content was created. The objectives of the new ELCM211 were the following:

- Understand the nature of Electronic Commerce
- Understand the business impact and potential of Electronic Commerce
- Understand the technologies required to make Electronic Commerce viable
- Understand the current drivers and inhibitors facing the business world in adopting and using Electronic Commerce
- Be able to explain the economic consequences of Electronic Commerce
- Understand the trends in Electronic Commerce and the use of the Internet

The content delivery approach for the new ELCM211 course was based on the development of a learning cycle (Figure 1) that combines constructivist-learning strategies (Marshall, 2004a; 2004b). As a result, tutorials and active learning sessions were developed to reinforce the theoretical concepts introduced in lectures and course readings.
The course objectives and the associated learning outcomes are in the center of the figure. Once each course objective was established, each component of the inner circle was designed to involve learners in the learning cycle in order to achieve such objective. The inner ring represents the course main components:

1) Lectures/course readings - The weekly two-hour lectures were designed to complement the textbook; however, they did not duplicate the reading material. In order to support more effectively the theories presented in class, class discussions, case studies, web examples and guest speakers were integrated in the learning process. In addition, some complementary course material was uploaded on “Blackboard” – the online course management system. Class attendance was not recorded and all material covered in the lectures was assessable.

2) Tutorials – The weekly one-hour tutorials were compulsory and attendance records were kept. Each tutorial group was limited to 20 students and it was expected that each student would attend at least nine of the eleven tutorials. For each tutorial, students needed to prepare and hand in a “tutorial brief” discussing the week’s tutorial topic/questions. Following the learning cycle, and according to learning theories, the tutorial briefs were designed to revise and reinforce the content presented in the reading materials and lectures (Greenway, 2004). The tutorials were designed to be a mixture of formal instruction to stimulate student-lead
discussions. These exercises aimed to prepare students not only for their tutorials, but also for the active learning sessions, as well as the final exam.

3) Active/Experiential Learning - The weekly one-hour active learning sessions were also compulsory and attendance records were kept as well. These sessions took place immediately after tutorial sessions and students remained within their tutorial group. It was also expected that students would attend at least nine of the eleven sessions. The active learning sessions aimed to link theory to practice improving the understanding of key issues of the discipline e-commerce. They were seen as an opportunity to work with “real-world” e-commerce examples. At the beginning of each session, the tutor (or active learning facilitator) guided a quick key-concept check with the students. Once the key-concepts were clearly understood, the class was divided into four groups of 4-6 students. Each group was challenged to find, analyze and present to the rest of the class “real-world” examples of the week’s key-concepts. The challenges varied according to the nature of the key-concepts of each week and a pool of wireless connected laptops allowed the groups to have Internet access during session.

4. Learning Outcomes and Assessments - The course assessment was divided into four components. The tutorial briefs accounted for 15% of the final course grade and were approximately one A4 page long. In addition, students were required to deliver two written assignments (worth 25%+20% of the final grade) in which students were asked to analyze the web-presence and the e-strategies of companies of a predefined industry. These reports were designed to apply and reinforce the theories and key-concepts delivered in the lectures, tutorials, and active learning sessions. The final exam (40% of the final grade) was two hours supervised short-essay style exam covering all material delivered during the course.

As illustrated in the outer cycle of Figure 1, each course component was designed to offer the opportunities for students to improve their understanding of concepts and gradually move from beginner (1) to competent (2), proficient (3), and then finally experts (4). An example of the application of this process could be the following. Let us assume that the topic of the week would be “the effects of e-commerce in the firm’s supply-chain”.

**Beginner** - Students would read the textbook chapter or supplementary reading on this topic. Afterwards, during the lecture, the key-concepts regarding the effects of e-commerce in the firm’s supply-chain would be presented, illustrated and discussed.

**Competent** – Students would prepare a tutorial brief discussing the week’s tutorial topic. In the tutorial session, they would then have the opportunity to share their views and discuss key issues involving “the effects of e-commerce in the firm’s supply-chain”. Above all they would be able to reach conclusions as a group.

**Proficient** - In the active learning session, each small group (4-6) would be challenged to identify, analyze and present to the rest of the class the supply chain of an organization as well as explain how e-commerce affects the flow of materials, services and information in that case. Each group would probably be assigned a different organization (from a diversity of industries, sectors, nature) in order to provide a rich range of “cases”.

**Experts** – The assignments and final exam would challenge the students to apply and demonstrate their understanding on the effects of e-commerce in the firm’s supply-chain.
During the first term in 2005 (February-June), the e-commerce learning cycle was used for the first time. The following section describes the evaluation of the ELCM211 experience.

**Evaluation of ELCM211 of the e-commerce Learning Cycle**

The purpose of the evaluation is to unveil students’ experiences as well as understand their perceptions towards the effectiveness of the e-commerce learning cycle. In addition to standard course evaluations, independent focus groups appeared to be a useful tool to identify if the new learning cycle has contributed positively to students’ learning experiences and outcomes. Gathering data through focus groups is particularly suitable for situations where opinions, perceptions, and feelings are important (Krueger, 1994; Denscombe, 1999; Putcha and Potter, 2004).

In September 2005, ELCM211 students were invited by e-mail to take part in the focus groups. Participation was encouraged by offering pizza and refreshments afterwards as well as the opportunity to participate in a draw for $100.00 worth of book vouchers. In addition to establish a point of comparison, former ELCM201 summer students were also invited to participate in this exercise.

Two focus groups were established. Each focus group consisted of two participants from the ELCM211 course and one student from ELCM201. The focus groups were facilitated by a research assistant from the faculty of education and lasted between 90 and 120 minutes. The process was recorded on audiotape and supplementary notes were taken. The recordings were transcribed by the focus group facilitator a few hours after the focus group took place (Hufnagel and Conca, 2001). The transcripts were analyzed highlighting statements and relevant key issues.

The following section describes the outcome of the focus groups.

**Outcome of the focus groups**

The summary of outcomes from the focus groups are organized according to the following aspects: individual course of study, individual learning styles, understanding course objectives, perceptions towards the course, course components, benchmark with other courses, and suggestions for improvements.

**Course of Study:** The initial discussion with participants in both groups suggested that, without exception, all six students began their university courses in areas outside e-commerce such as information technology and accounting. There was a general agreement amongst them that ELCM211 and ELCM201 papers were chosen to complement other courses of study and that doing this introductory course influenced them into changing (or adding) e-commerce as a major. In addition, all participants had been successful in passing their respective course requirements.

**Learning Styles:** The students appeared to be quite confident about their university studies. While four students suggested that they were independent learners who enjoyed learning - not just to gain pass marks - but also for the intrinsic satisfaction that can be gained from learning; two others said that they only “did what was necessary to pass” and they needed “clear structures such as compulsory assignments and inflexible deadlines” in order to be “motivated”.
In addition, all of the participants agreed that they learned best by doing and by exploring relevant examples such as the use of case studies. As pointed out by one student, “I prefer examples which help illustrate the point. Plain theory, I find hard to pick up the concepts”. Opportunities to interact and cooperate with fellow students, tutors and lectures were also seen as a vital aspect for the effectiveness of their learning process. Two participants pointed out (this appeared to be a consensus among all) that the relationships they established with lecturers and tutors are also important to the way in which they engage with the course materials and learn. One student said that the lecturer personality, enthusiasm and passion for what he was teaching influenced how effectively they learned. Another student suggested that being able to get along with tutors during tutorials - being unafraid to ask questions and have a bit “fun” while learning - was important to them.

Understanding Course Objectives: participants from ELCM211 pointed out that the clear links in the learning cycle helped them to understand the course objectives. The students from ELCM201 felt that mixing managerial and technical content in the same course resulted in a less clear understanding of the course objectives. In addition, both ELCM211/201 students indicated a small degree of dissatisfaction saying that some of the course content lacked a little in depth. However, there was a reasonable degree of appreciation among them that both courses were introductory courses and that there was the opportunity for exploring some of the content with more depth in the courses that followed ELCM 211/201.

Perceptions Towards the ELCM211 Course: The four students who completed ELCM211 had a extremely positive opinion about the course. They believed that they had made a good choice in selecting ELCM211 as part of their course of study and that it had influenced their major selection. During the discussion, three main factors surfaced as contributors to their positive course perceptions:

Relevant - The course content was perceived as relevant to “real-life”. As suggested by one student “we had real life situations in combination with a theoretical background and this was good - because I could realize how it works in real life”. Another student pointed out that she found the course interesting because she could find applications in real life; while another participant indicated that the assignments represented problems that could be encountered “downtown”. In addition the use of videos showing local business cases in the lectures were seen as something positive - “it illustrated a real life situation and it was a business we all knew pretty well. I thought it was great”.

Interactive - All components of the learning cycle provided opportunities for participation and discussion. Both focus groups discussions led to an agreement that there were high levels of interaction between lecturers, tutors and students throughout the learning cycle and that this interaction was encouraged. As suggested by one student: “We were encouraged to raise questions and interact – if I had a question they (lecturers) would actually stop and answer my question”. They also agreed that high levels of interactions aided them to understand key-concepts and increased their ability to complete assignments. It was interesting to observe that while one student praised the benefits of interaction between students in the small groups, other two participants appeared to be more focused on the benefits of the interactions between students and lecturers - “some people found it (interacting with lecturers during lectures) quite scary. I found it quite good. It made the lecture more interesting”.

Progressive and Logical Flow - Students recognized that there were strong links between each stage of the learning cycle and that it was designed to move them through stages of
development. In particular, they recognized that each component provided an opportunity for revision and deeper understanding of concepts already learned. One student pointed out: “The lectures kind of provided a platform to go up and to build on. We would be introduced in a lecture to a concept say B2B transactions and then all these other three areas, tutorials, active learning and assessments kind of help to build up our understanding”. Some activities such as tutorial briefs assisted their preparation for the exam. One of them said: “what I liked is that if you had done all the work for the tutorials each week, at the end of term the exam was really easy”. In addition, tutorial briefs, assignments and exams were viewed by most participants as an opportunity to apply the knowledge gained from readings, lectures, tutorials and active learning.

On the other hand, the perceptions from the two students who completed ELCM201 were not quite as positive as from those that did ELCM211. While both agreed that much of the content of the course was interesting, one of them was very critical about the lack of continuity between what was delivered in the lectures and what she experienced in the tutorial sessions. She implied that the lectures were very much management based while in contrast the tutorials required a high degree of technical knowledge which was not taught in lectures. In addition, she pointed out that the lack of links between components hindered to a considerable degree her ability to understand course materials.

Course Components: There was not a convergent opinion among the students regarding which of the course components had the greatest impact on their learning experience. Two participants identified the lectures, another two suggested the assignments, while one said it was the active learning component, and the remaining student did not identify any specific component. Overall, these perceptions towards one specific component were not strong. Particularly the ELCM211 participants saw the component complementing each other.

However, it was interesting to observe that while only one participant identified the active learning component has having the greatest effect, during the focus groups the ELCM211 participants where particularly proactive in trying to “convince” the ELCM201 students (who had not been involved in this activity) of its benefits. The following comments illustrate some of the opinions:

“With active learning you get other peoples thoughts and thinking and start to see how they think and incorporate their thinking into assignments. You really get a good understanding.”

“We might have talked over the lecture (in tutorials) but we didn’t really learn until we got to the active learning and begin to implement it as groups.”

“I enjoyed it (Active learning). The people in my tutorial made it fun working together and stuff. Sometimes a couple of the exercises, I can’t remember which ones, were a waste of time but most of them were quite good. It was good to see how what we did got applied on to work and the real world.”

Again, factors such interaction, relevance to practice and their lives as well as a progressive and logical flow of components appeared to be critical success factors for the course and its components.
Benchmark with Other Courses: Discussion with participants suggested that they did not perceive major differences between ELCM211/201 and other papers that they had or were undertaking. Comments from some ELCM211 participants suggest they perceived some differences in the way tutorials were run in ELCM211 - with emphasis on real life/workplace experience. It was also noted that the two students from ELCM201 made no reference to any difference with respect to tutorials. Three students indicated that ELCM211 tended to have a higher degree of interaction between lecturers and students than in some of the other courses they have attended.

Suggestions for Improvement: Discussion regarding suggestions for improvements tended to revolve around issues such as whether or not lectures should be one or two hours in length, if the current textbook should still be used, and what parts of the course should be compulsory. No one suggested either removing or adding any of the learning cycle components. All ELCM211 participants were in general agreement that the learning cycle should remain as it is, while the ELCM201 students indicated that they would like to have had active learning in their course. One interesting suggestion was that presentations in the active learning sessions should be a part of the course assessment.

The following section presents a discussion about the implications of the findings on the future design of courses of similar nature.

Implications and Conclusions

Overall, the ELCM211 students that participated in the focus groups perceived the learning cycle as an effective way to structure course activities and a contributing factor to improve their understandings of the course materials. They also indicated that they were very satisfied with the learning outcomes of the course and that they believe the course objectives were achieved.

Some of the points raised by the two participants from the old ELCM201 as well as our own experience would suggest that providing a clear distinction between courses of technical and managerial nature has a positive outcome on students’ learning. In addition, the implementation of the e-commerce learning cycle with an active learning component as well as high levels of peer and student-instructor interactions throughout the cycle has produced positive perceptions among students.

The findings also suggest that participants enjoyed the progressive and logical flow of activities as well as the strong links between each component of the learning cycle. In addition, they perceived that each component played a specific role in their learning process – not favoring a particular component.

The students also perceived that the course content and learning experiences that were linked to “real-life” scenarios (especially the active learning sessions) helped them to apply and improve their understanding of theories and concepts approached during the course – making it relevant to them. In addition, challenging and applied assignments with strong links between what was covered in class were seen as a good opportunity to “put in practice” their knowledge and skills.

The findings described in this paper are well supported by the constructivist theories of learning - in particular experiential, co-operative and active learning. While the emergence of constructive practices in tertiary education may be restricted by the traditional teaching
practices physical nature of tertiary institutions, the e-commerce learning cycle provides a useful model for the design of an undergraduate course in e-commerce.

The results described in this research, while it provides some valuable insights into how this new approach impact on students’ learning, it must be closely scrutinized in their application to other contexts. The research was conducted with a small sample of students and the results were drawn solely from the participants’ perspectives and thoughts. Further research should widen the scope of the research in order to provide results that are indicative of a broader range of individuals. Further studies could also be undertaken regarding students’ performance and learning outcomes, particularly in different contexts and disciplines.

References
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