

Evaluating block mode delivery as a mechanism for integrating industry related courses into tertiary study

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Tertiary students are increasingly seeking ways to maximize their study time and reduce the time spent in gaining qualifications. At the Eastern Institute of Technology, Hawke's Bay (EIT) a new third year degree paper based on industry specific content was delivered using a two week block mode format over the Christmas vacation.

This paper builds on an earlier paper relating to the establishment of industry partnerships presented at the 2003 National Advisory Committee on Computing Qualifications Conference and investigates the problems and benefits of attempting to deliver a new technical subject over a short time frame. The paper considers the views of both instructors and students, and presents the findings of a survey taken to evaluate the reaction of participants to this mode of delivery.

The paper attempts to identify if block mode delivery of degree courses is likely to impact on the way that institutes of technology offer their degree programmes. It also includes the findings of a survey of polytechnics and institutes of technology, conducted to establish their attitudes towards block mode delivery.

We believe that courses with industry specific content lend themselves to concentrated block mode delivery and that block mode courses will become an accepted method of course delivery.

Keywords

computing practice, industry collaboration, delivery mechanism, block courses

1. INTRODUCTION

Tertiary institutes have valued working relationships with commercial organisations as an essential mechanism for ensuring that courses meet the needs of industry. Such relationships are also seen as a way of ensuring that graduates gain the skills that will prepare them for employment within the Information Technology market place.

This paper traces the ongoing relationship between the Eastern Institute of Technology (EIT) Hawke's Bay and the networking provider, Allied Tellysen, which was first introduced by Corich and

McLay at the National Advisory Committee for Computing Qualifications conference in 2003.

The paper starts by investigating the pedagogical evidence that supports the delivery of courses that are based on real-world experiences and the particular needs of industry. It then revisits the special relationship that exists between EIT and Allied Tellysen Research (ATR) and explains how ATR router and switch training materials were used as the basis of a third year practical data communications degree course. The paper then traces how the course was delivered as a summer school course, using a block mode delivery mechanism, and reports on the reaction of students and staff to the course and the delivery methods used. The paper concludes by looking at the potential for further developments based on the EIT and ATR relationship and considers the potential role that block mode delivery may play in the future.

2. THE PEDAGOGY OF INDUSTRY BASED CONTENT

Support for integrating industry training needs into tertiary courses can be found in the constructivist and socio-constructivist theories of educational psychologists such as Piaget, Bruner and Vygotsky, and the theory of androgogy introduced by Knowles and supported by Merrill and Brookfield. These theories emphasise the importance of constructing knowledge based on practical experiences and the need for adult learners to take responsibility for their learning.

Courses based on industry requirements are viewed by learners as being relevant and immediately useful, providing skills which will enhance employment prospects. The attitudes shown by students participating in such courses are usually more positive than the attitudes shown towards more traditional educational courses. Industry based course also offer opportunities to integrate real-world practical examples in course work and share experiences and learn from industry practitioners.

The use of real world case studies is based on an educational philosophy, which associates knowledge directly with action (Boeher, 1995). The case method is based on a principle that real education is an experiential experience that consists of a combination of learning experiences.

Supporters of the use of real word practical exercises in education adhere to two fundamental principles. The first is that the best-learned lessons are ones in which students discover for themselves through their own struggles, and the second is that the most useful kinds of understanding and judgment cannot be taught but must be learned through practical experience (Volepe, 2000).

When instructors use materials based on industry requirements they are using real-world problems as a platform that can challenge students to learn skills that will be appropriate to deal with the practical problems they will face in the work place. Such methods allow students to work through a problem and reach a deeper understanding of concepts than they would have if they had only read a text or listened to lectures.

Velenchik (1995) highlights issues addressed by the use of real world case studies. Case studies motivate students to learn by providing a platform where tools are needed to solve problems. Students then start looking for the tools rather than expecting to have them delivered. Case studies also encourage students to apply the theory, placing a focus on analysis and evaluation, enabling students the opportunity to identify limitations of theory.

The emphasis that case studies place on analysis and evaluation, helps students move up the cognitive skills ladder from the low level skills of comprehension to the higher level skills of analysis and evaluation. The case method provides a stimulating environment within which to develop the cognitive skills in learners.

Volpe (2000) suggests that is no single approach to case teaching. Instead there are different approaches that work for different people in different situations. He also suggests that there are two main ways of using case studies. The first is to use the case study to support and illustrate lectures and seminars and the second is to use the case study to challenge students to grapple with the decision making process, formulate a strategy and come to class ready to explain and defend their strategy. The addition of Allied Telesyn's industry based case studies to the existing courses will allow both approaches to be adopted.

3. THE RELATIONSHIP BETWEEN EIT AND ALLIED TELESYN

The relationship between EIT and Allied Telesyn Research began in 2002, when ATR won a contract to provide a replacement backbone network at EIT. When the contract was signed, the two organisations decided to investigate if it was possible for both parties to gain from additional non-contractual relationships. The integration of ATR training materials into EIT degree courses was seen as a mechanism which had benefits for both parties. EIT would be able to offer a course that was sanctioned by industry and would be seen by students as being relevant providing improved employment prospects. ATR would increase their profile in the North Island and they would have an increased pool of potential employees with practical experience using ATR switches and routers. ATR agreed to provide a class set of layer 3 switches and provided access to their course training materials.

4. COURSE DEVELOPMENT

Degree teaching staff at EIT looked at the training materials provided by ATR and attempted to identify how they could be incorporated into existing degree data communications and networking courses. Much of the ATR theoretical content was being taught in the EIT first and second year data communications courses, however switch based network design and switch programming techniques were areas that were not covered. Since designing, building and implementing switch based networks

requires higher level cognitive skills which are requirements of higher level year courses, it was decided to develop a third year data communications course which incorporates the design and creation of switch and router based networks and utilizes the use of ATR equipment.

The opportunity to use ATR materials and equipment and develop a new course coincided with an EIT institute decision to adopt a 15 credit institute wide degree structure. The decision resulted in a requirement to rewrite the existing 12 and 18 credit courses and develop courses which had a common 15 credit value. The incorporation of ATR materials and the development of a new third year course was approved as part of the new 15 credit structure, which was to be phased in over a three year period. The course redevelopment plan would have seen the new third year data communications course being offered for the first time in 2005.

To ensure that the relationship between EIT and ATR was given the opportunity to develop and to take advantage of the materials and equipment provided by ATR it was decided to offer the course in 2003 over a two week block course, as a summer school offering. Students were surveyed to see if sufficient numbers would be interested, and as a result of their positive response a decision was made to allow 12 students to participate in a pilot course at the beginning of December. The number of students was dictated in part by the number of switches available and the need to provide all participants with hands-on use of networking equipment. Since the course was the first computing degree course to be tailored to meet industry training requirements and also the first course to be offered in block mode it was decided survey students and staff to gauge their reaction to the course.

5. STUDENT AND STAFF RESPONSE TO THE COURSE

When students had completed the course they were asked to rate their feelings about various aspects of the course against a five point Liechhardt scale, where a score of 5 indicated that they strongly agreed and a score of 1 indicated they strongly disagreed.

When asked if the course had extended their current knowledge and skills, all students agreed that it had to some extent. When asked if they believed the learning materials were helpful and well presented, all students agreed that they were. This indication of support for the materials is pleasing since the majority of materials used were provided by ATR. When given the opportunity to comment on the quality of materials, three students expressed concern that the materials appeared to be out of date, and that significant sections of the materials provided appeared to be repetitive. When asked if the course was easy to follow, 90% of students indicated that it was. However several students indicated that the shortened delivery timeframe gave little time to consolidate and cement ideas.

When asked about support for the block mode method of delivery, 70% of students indicated that it was a good idea, but when it came to agreeing that all 700 level courses should be offered using block mode delivery support fell to just over 40%. Comments made by students about the block mode delivery indicated that the time frame (two weeks of classes) was too short and that block mode delivery would only be suitable for courses which had a high practical content. Others suggested that it was good to be able to concentrate on a single subject, compared to the traditional situation where students have to juggle the learning of up to five subjects concurrently. One student commented that they appreciated the focused approach and another suggested that it made learning easier.

All students indicated that they appreciated the opportunity to participate in a course which had strong ties industry and they expressed support for aligning degree courses with equivalent industry courses. Even though the number of students participating in the course was limited to half the normal practical class size, two students indicated that every student should have individual access to multiple switches, and that more powerful and sophisticated switches should be available.

When other New Zealand institutes of technology were surveyed to estimate the level of support for block mode delivery for IT courses, five out of the thirteen institutes who responded indicated that they used block courses for some of their degree papers. When asked to comment on the block mode method of delivery one respondent expressed con-

cern about Studylink restrictions and the requirements for a minimum number of hours study in relation to the credit value of a course. Another suggested that block mode delivery was seen as being good for students but very intense and stressful for staff. Concern was expressed about the lack of time for students to consolidate the materials being studied, however the use of block mode delivery for summer school courses for students repeating subjects was strongly supported.

When the course was delivered at EIT it was decided to share the teaching responsibility among three lecturers, as a way of reducing the stress for staff delivering materials and providing some form of variation for students. All three staff noted that students appeared to be well motivated and that they applied themselves to their work consistently. Many students stayed after formal class times to practice the skills that had been taught and the level of student interest appeared higher than that shown in the more traditional data communications courses.

6. CONCLUSIONS

The experiment with block mode delivery and the incorporation of industry specific content into a degree course was seen as a successful exercise and worthy of further investigation.

To allow students more time to consolidate the materials covered during the course, it was agreed that students would benefit more if the two week delivery period was separated into two blocks with time given between for students to conduct research and practice the skills learnt. Since the course was a summer school offering, the first week could be delivered in early December following the completion of semester 2, and the second week could be delivered in mid January.

Staff at EIT have discussed the idea of expanding the block mode summer school delivery mechanism and using it to introduce more planned new 700 level courses within the degree. A Database Administration course is planned for the 2004 summer school and other new subjects that could be trialed include a Security paper and an advanced Unix paper.

The relationship between EIT and ATR has proven to be beneficial for EIT and it has increased the profile of Allied Telysen among the tertiary information technology teaching environment. EIT now

has a number of students who have practical experience working with Allied Telysen products, and the two organizations are investigating opportunities for students to undertake their industry project placement in Christchurch working alongside ATR staff. The first students to complete the degree having taken the 700 level Data Communications course will be looking for work in July and they will no doubt be sending their curriculum vitae to Allied Telysen to see if any job opportunities exist.

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