

ATTACHMENT B

Report on the Implementation of Tablet Personal Computers (PCs) in the CUC107 Classroom

Introduction

Background

Charles Darwin University was supplied with some 50 or 60 HP Tablet PCs in 2004 to be trialled in classrooms and used in IT research. After some teething problems in setting up wireless network systems in 2004, they have now been used successfully in the Wireless classroom for over three years and it is timely to report on the progress of using the hardware within the class and developing curriculum and teaching practices which maximise their functionality in the classroom and provide an improved learning experience overall for students enrolled in the Common Unit.

Aim

The aim of this project was to introduce the Tablet PC technology into the CUC107 tutorial classrooms as a way of enhancing students learning experience. A tutorial program was developed which uses the Tablet PCs to access and utilize the web resources available as part of CUC107's online learning materials and the continuing aim is to enhance the learning experience by developing pedagogical practice and ensuring this practice makes the most of the learning technologies.

Description of Tablet PC and its application for learning

The tablet PC technology allows for the introduction of the internet to each one of the students in a classroom setting and provides access to the unit resources at the students' desktop.

Tablet PCs are in some ways like small laptop computers, but have a number of affordances which make them more suitable to a classroom environment. Tablet PCs:

- Are able to lie flat in a way that hides (or the screen can be detached from) the keyboard and can therefore be used in a format not unlike an old slate. The advantage of this is that there are no screens that block vision and lines of site between students sitting in groups and therefore the benefits of technology can be inserted seamlessly into group work activities. The PC becomes somewhat invisible in the classroom.
- The inclusion of a stylus and an interactive monitor allows students to use the screen to handwrite, make handwritten notes and add comments to documents. Students therefore have the versatility of both handwriting and typing options when using the machines.
- Students are able to browse the on-line resources for this unit, access wider resources on the web, contribute to online discussions and activities, access e-reserve readings and WP documents on their desktop. This will enable the tutorial activities to directly relate to the resources available on the web and with the tutor's guidance insure that internal students fully utilise these resources.

- Documents and presentations used in class are available immediately to the students and can in fact be accessed prior to class (and if a class is missed). Students can annotate notes to presentation and can download activity documents, readings and resources directly in the class to work together as a group or completed tasks individually in class.

Introduction of the Tablet PC is to the CUC107 tutorial classrooms/workshops enables the advantages of resource-based learning to begin to be realised.

Teaching and Learning benefits

There are a number of benefits to the teaching and learning process in introducing Tablet PCs into the CUC107 classroom.

- There is a more consistent experience for students enrolled internally in CUC107. A consistent classroom program implemented across all groups ensures that all students have the maximum possibility of experiencing the same learning experience no matter which class they attend.
- Development of a large number of resources ensures that the external and internal experience for students is essentially the same. Students are required to complete the same activities, have the same resources to do so and are able to switch between internal and external modes easily in the pre-census date period without difficulty.
- Use of the Tablet PC allows for a more practical way of integrating academic literacy learning outcomes into the subject and developing those skills with both a subject context and a real life and immediately available researching environment – students can complete research activities in class without having to wait to go to the library. These activities are now being incorporated into the curriculum of the workshop classes.
- Use of Tablet PCs in workshops provides a collaborative environment for students to become familiar with computer hardware as well as the CDU on-line learning environment (Learnline, Library, Databases, on-line resources).
- The running of workshop classes has significantly lessened the timetabling requirements of the CUC107 class. This was particularly evident in semester 2 2008 where on five 3 hour sessions were run to cater for some 300 initial internal enrollees.
- Whilst the formal data is still being processed, anecdotal evidence and informal observation suggests that the following student related outcomes have occurred:
 - *Increased retention of students in workshops to the end of semester.* Comparison of students attendance rates between week 3 to week 13 indicate an increase from about 25% to 50% of week 3 attendance numbers. Changes to the curriculum and assessment in 2008 has seen attendance jump to about 80% to 95% of week 3 attendance numbers in week 12.
 - *Increased engagement of traditionally difficult student demographics.* Initial observation has demonstrated that some groups of students who would normally be difficult to engage in the learning process. This includes young (school-leaver) males and more importantly Indigenous males and students with disabilities.

- *Increased retention of technologically challenged students*
Initial observation suggests that students who have difficulty in managing the use of technology stay in class because of the ability to have greater one to one contact with staff in a workshop environment with immediate access to tablet PCs.
- *Encouragement of students to bring their own laptop and mini-computers to class.*
Increasingly, students are now using their own hardware within the wireless environment and the pedagogical environment fosters their use within the classroom.
- Introduction of the Tablet PCs into the CUC107 tutorial environment provides some important incentives and opportunities for reflection on pedagogical practice for teachers:
 - Access to on-line resources within the classroom provides an opportunity to rework and re-think the curriculum for a unit. Demonstration of ideas, individual or group research, practical activities and group discussion supported by access to resources are all viable options for activities within a Tablet PC workshop that are not immediately available in the usual lecture/tutorial format. The use of a workshop format (and the dispensing of long lectures), the formation of groups within the class and the focus on group discussion and collaboration are all facilitated by the use of the Tablet PC.
 - Immediate access to the internet within the classroom provides one component of a series of important feedback sources for staff in the workshop. The immediacy of the on-line environment and the physical proximity of teaching staff and students in a workshop environment that is necessitated by the use of Tablet PCs, means that feedback from students is immediate. If something isn't working pedagogically, then the students are likely to be doing something else and the signals of student engagement are not there.
 - The learning environment also allows for students to multi-task. It is something which can be un-nerving at first, but often students who are demonstrably engaged in the class are also doing other things like Facebook, doodling, surfing etc). it is challenge to the teacher to ensure that students are engaged because it is easy for multi-tasking to slide into disengagement.

Issues

There are a number of issues that are important to address. These have the potential to cause problems in the future if Common Units programs are to follow and in fact are in some ways responsible for the low level of SELT responses in CUC107 in s208.

- The program which has now been developed is somewhat dependent upon a particular teaching format and access to a PC environment. If the technology isn't continued to be supported, then we need to have a contingency plan for how to run CUC107 without PCs.
- Some staff may find the use of technology within the classroom intimidating or even frustrating if it isn't working effectively. There is potentially a limit to who may feel comfortable in working within both a different technological and pedagogical environment.

- Following on from this, the limited number of staff at CDU who are now comfortable about running a CUC107 workshop is limited so both succession and contingency plans need to be in place to ensure that the program continues.

Another important issue which needs to be flagged is an informal observation that there has been a recent drift towards external enrolments. It is hard to discern whether this is a product of the availability of resources or the format of the workshop program.

Logistics

Infrastructure requirements

Many of the initial infrastructure requirements have been addressed since 2004-5:

- A dedicated classroom was fitted out with wireless nodes, desks in group arrangements, storeroom and updated equipment – much of which has been supplied through the School of IT. Expansion of this through recent University funding will see the establishment of at least one other wireless PC workshop to meet increasing demand on the current room.
- Replacement PCs introduced in 2006 to supplement ageing original PCs.

Timetabling

There has been a cost saving in the amount of tutorial staff required to run the internal program for CUC107, after the initial experiments with having three people within each workshop was revised to two.

Training

A more formal training program is being developed to induct staff into the process of teaching in CUC107 and the Tablet PC workshop. Both technological and pedagogical issues will need to be addressed by the workshop. This component of the development of the program is crucial in addressing the issues of succession and contingency.

Risks and Risk management

The risk involved in the development of the program is worth considering given that the involvement of technology in teaching is still slightly risky in terms of technological breakdowns. Few problems have been evident in the 6 semesters of internal teaching. Some initial problems were encountered in Semester One 2006, but there have been no significant technological problems subsequently.

Students' experience of learning in the tutorials relies heavily on good facilitation and support by the tutors to ensure students participate, stay on track, communicate effectively and don't become lost in the technology at the expense of engaging fully with the content. The abovementioned risks related to staffing are an important issue and both succession planning and contingency plans for a lack of staff willing or sufficiently prepared to lead Tablet PC Workshops needs to be addressed.

Implementation

Implementation over the last three years has led to some positive outcomes for students. Some comments drawn from recent SELT responses that relate to the use of technology and hardware in the workshop include:

- By having the tablets, we were able to have PowerPoints in front of us, which is helpful, as we can go at our own pace (at home) and actually take note during the class.
- To learn the cultures of the NT, use tablet PC to search information faster and easier, assessments help me to get more knowledge about my major course.
- The super deadly laptops which make learning more interesting and allow for information access via the web easy. I love having the tablet computer, being able to access info on the 'fly' is handy.
- Group work. Access to technology, Learnline and large group to discuss (were strengths).

In addition, there continues to be both positive and negative feedback about the general program and subject material covered in CUC107. Some feed back is very positive and I would suggest reflects the changed format of workshops/tutorials that is related to the introduction of Tablet PC.

- Working in groups (the one group divided into smaller groups) and then joining back as one.
- The casual workshop was fantastic, I wasn't afraid of group interactive because the tutors were so approachable.
- Out of 5 units I've undertaken this semester it stands out as the one where great effort by the tutor was put in. As a consequence, I loved coming to it. The content was delivered exceptionally well. I'm disappointed it's over and if CUC107 part 2 was offered, I'd enrol. It was fantastic.

Other responses which are at the more negative end of the spectrum include those which reflect a general contempt for the Common Units program.

The pilot program established in 2006 led to re-development of the curriculum and website resources which occurred in 2008. Implementation of those new resources over the last two semesters (s208, ss08) and now in s109 show that there are some considerable improvements – with some feedback from internal students being positive in this regard. Issues relating to piloting the new website and resources in S2 08 means that some SELT responses for this semester will reflect students frustration with some of the logistics of delivery and structure of the website which have been ironed out once we had used the material. SELT responses in Semester Zero in 2008 and in Semester 1 2009 will hopefully provide a more solid response to the newly developed resources and their use by external students.

There are some curriculum issue that still need to be addressed, including the process of integrating the use of Tablet PCs more closely into the curriculum, an review of group work particularly with external classes and the integration of academic literacies skills more closely into the curriculum.

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