

## Do you see what I see?: The challenges of teaching basic computing skills at a distance

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### Introduction

The STEPS program offered by Central Queensland University, Australia, is an enabling program which aims to teach adults the necessary skills to successfully undertake university study. The program was established at the University's Rockhampton campus in Central Queensland in 1986. Since this beginning the program has grown steadily, both in the number of students enrolled and in the number of teaching locations throughout CQUniversity's multi-campus footprint. In 2014, STEPS is being offered on 5 regional Queensland campuses and 2 capital city campuses, with plans for further expansion in 2015.

In addition to a steady increase in the on-campus enrolments, a significant boost to enrolments occurred with the introduction of a distance offering of the program in 2006 (Sturgess, 2007). In the first years of offering, the number of places available for students in the distance program was capped, but it was immediately apparent that there was significant market for this mode of learning, with demand regularly outstripping the availability of distance education places. Since this promising beginning, the number of distance student enrolments has continued to grow at a much faster rate than internal numbers and now accounts for approximately two-thirds of each year's enrolments in STEPS (Figure 1).

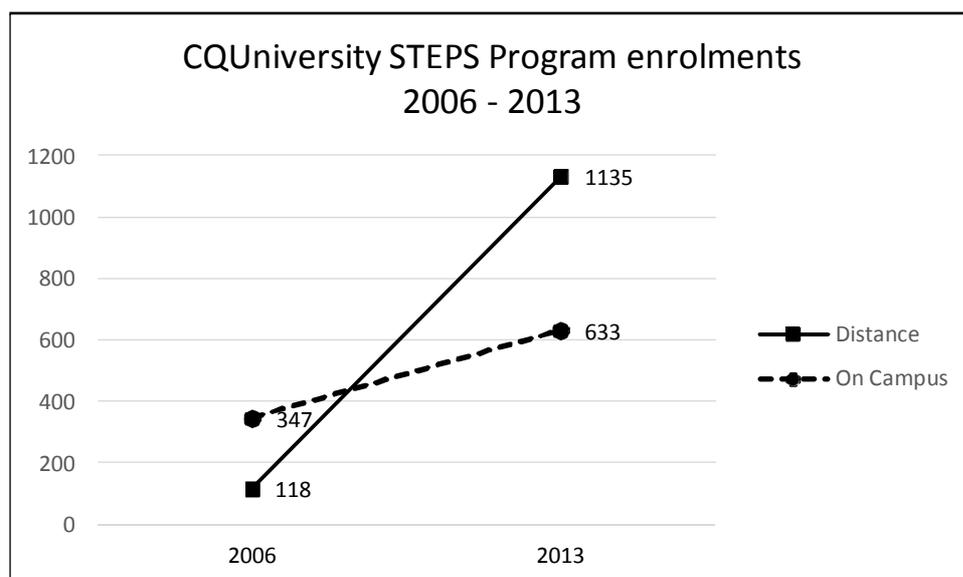


Figure 1: Annual enrolments in STEPS program at CQU (2006 and 2013).

Although the content of the distance STEPS program was based on the existing courses, some level of redevelopment was required to make them appropriate for the distance mode of study, ranging from re-packaging existing course materials in some cases to a complete re-examination of the pedagogical approaches in other courses. The growing numbers of distance students has also driven several wide ranging changes at the program level. These include the introduction of a third teaching term each year, which is only delivered in distance mode, and the integration of the STEPS Distance and STEPS Internal programs into a single program structure, with the same course content being taught to all students.

The authors have been involved in teaching, developing and coordinating the computing skills course within STEPS since its first offering in distance mode. This course, currently named Computing Skills for University (CSU), teaches generic computing skills, such as saving files, as well as productivity skills such as Word Processing, PowerPoint and Spreadsheeting, using Microsoft Office as the platform. The annual enrolment for this course in 2013 was 1018 students, with 723 students studying the course by distance.

In this paper, the authors will reflect on our experience of teaching this course over the past nine years, with particular reference to the challenges of teaching students who are geographically remote. The characteristics of the students, of the course, and of the learning context will be discussed, in addition to a range of strategies developed to support these students.

### **The role of an enabling computer skills course**

In 2001, Prensky (Prensky, 2001, 2009) heralded the advent of a generation of students that he dubbed "Digital Natives", born and bred in a world immersed in digital technologies. Prensky argued that young people born after 1980, differ from previous generations not only in the degree to which they use technology but in more qualitative ways, such as the way they interact with technologies and even the way they think and learn. He called for a radical overhaul of education systems because "Today's students are no longer the people our education system was designed to teach" (Prensky, 2001, p.1).

Almost 15 years later, when the term Digital Native could now be applied to anyone under the age of 35 it would be reasonable to assume that a high level of technical literacy would be the norm and there would be little or no call for an enabling computing skills course such as CSU. However more recent commentators, (Bennett, Maton, & Kervin, 2008; Jones, Ramanau, Cross, & Healing, 2010) have questioned Prensky's conceptualisation of a distinct generation of Digital Natives.

While not disputing the idea that a proportion of people in this age group are very experienced and proficient in using technology for a range of purposes, it has been found that a significant section of the cohort do not share this level of expertise. "It may be that there is as much variation *within* the digital native generation as *between* the generations" (Bennett, et al., 2008, p. 779). From our experience we would agree that we cannot assume a straight correlation between a student's age and their computer competency. A more useful approach is to seek a more nuanced approach, giving consideration to a range of factors such as access to technology, personal motivation, economic access and previous experience (Bennett & Maton, 2010; Dijk, 2012; Kuhlemeier & Hemker, 2007)

Another concern that has been raised about this conception of the highly computer competent Digital Native is around the specific nature of their technical skills. Several studies have questioned the relevance of much everyday technology practices to academic pursuits such as finding and critically assessing internet based information (Bennett, et al., 2008; Lorenzo & Dzuiban, 2006). Similar concerns have been reported about the inability of apparently adept technology users to use the basic productivity software that is taught in the CSU course and is required to produce academic products such as word processed essays and reports.

A factor that contributes to this disconnect is the increasing prevalence of mobile devices, such as smart phones, as the most common computer technology in daily life. Kamenetz (2013, n.p.) reports an American teacher's comments about her teenage students: "They're extremely computer-illiterate, but that doesn't mean that they're not tech-savvy...They're all over Twitter but they don't know how to save a Word document." In this context, computer literacy refers to a range of desktop computer skills that are required for many workplaces as well as academic work. Being "tech-savvy" and competent with their everyday mobile

technology may mask this lack of skills from the student themselves as they often don't realise that there is a set of skills that they are missing.

Although we may question the extent to which Prensky's call for a radical change to pedagogy is justified or has been answered, that is not to say that the increasing penetration of technology has not changed the face of higher education. Taylor (2001), building on the previous descriptions of the evolution of distance education practice (Garrison, 1985; Nipper, 1989), described the use of computer technologies and internet based interactivity to enhance distance learning as the next generation of distance learning. Commentators such as Anderson & Dron (2011) have expressed concerns about focussing too much on the affordances of currently available technology, and not enough on enhanced pedagogical approaches.

However, the apparent benefits of online delivery have been sufficient to ensure that it has not only been widely adopted to support distance learning, but increasingly utilized with on-campus classes under titles such as flexible learning, blended learning or e-learning. Currently, every course in the STEPS program has an online site contains core elements of course such as content, activities and assessments which are to be used by internal as well as distance students. This is in line with standard practice at CQUniversity.

Although this extensive use of technologies is promoted as offering greater choices and flexibility for the individual student, it does assume that every student has the technical, economic, social and digital skills to be able to access and work with digital content. This expectation also applies to many non-academic processes within the university such as enrolments and accessing university services.

We would argue that this implicit expectation of universal digital access is a false expectation for the reasons discussed earlier. In this environment, the development of basic computing skills for new and prospective students becomes an issue of equity of access.

### **Teaching at a distance**

There are some problems that are inherent in distance education, where there is no opportunity for face to face interaction between the teacher and the learner. There are also some challenges that are specific to a computing course. For example, communications are problematic when a new student has not yet learned how to use communications technologies such as email.

In CSU, lecturers offer distance students individual assistance via email or phone. To do this the lecturer needs to understand what the student is doing and what part of their action needs to be changed to obtain a successful outcome. In some cases this is straightforward but there are a lot of factors that can complicate the process. If the student is using a different computer systems, such as a different version of Microsoft Office, or Windows 8 when the teacher has Windows 7, or is working with an online system that is only available to students, it can be difficult to picture what the student is seeing or doing. This makes it very difficult to explain what button or menu they should be looking for, or where a particular icon will be located.

This problem is exacerbated with novice users who are not familiar with the operation of a simple tools, or with standard computer user terminology. This can lead to difficulty in articulating their query or problem, and also understanding explanations or instructions. This lack of language can also result in the novice becoming very literal in their understanding and unable to generalise from the instructions to their specific computer environment. For example, we have had the situation where a novice user could not find an icon called "My Computer", because the icon on their desktop was labelled simply "Computer". This type of

misunderstanding can lead to very lengthy and frustrating conversations to solve what are really very simple problems.

Often, novice users have not yet developed any sort of conceptual understanding of what is happening with their computer. They are following instructions without any clear idea of what they are doing or what the likely outcome will be. This means that they are often unsure whether they have completed a task successfully. One task that many students have difficulty with is simply saving a file to a predetermined folder. Even though our course takes them through the process of identifying different storage areas in the computer system, creating and naming a folder and then saving a file to that folder with a meaningful name, novice users may not really understand what has happened to that file and make the connection between the icon in the folder and the document they created.

These skills do develop with practice, but novice users are often lack the confidence to experiment or try a technique if they are not completely sure that they are doing it correctly. Trial and error can be an effective way of developing skills but it does require a level of self-confidence that many novice users don't possess. Presenting them with instructions and activities that allow them to practice simple skills in a controlled way helps them build their self-confidence for the more complex tasks.

On the other hand some students show the opposite problem of over-estimating their skills level. This seems to be most prevalent with younger students and may relate to the issue of being Tech-savvy but not Computer Literate. These students will often attempt the assessments without working through the lessons or obtaining feedback from the lecturers first. We have trialled issuing individual advice to students who have achieved a failing grade in their first assessment to ensure that they are aware of the grade and reminding them of the content and support options available to improve their future results. A number of students have shown significant improvement in subsequent assessments.

### **Study resources**

The core of any distance course is the learning materials which provide the framework for the students learning activity. The design of the CSU curriculum aims to provide a set of resources that could be understood and used by an extreme novice user. These are very detailed with extensive use of images, step by step instructions, video examples and frequent hands on activities. The resources have been designed to encourage independent study, but they are further supported by lecturers who can answer questions and provided feedback on weekly formative activities.

### **Videos**

One very successful strategy that we have implemented is the development of a series of short videos that demonstrate the techniques taught in the study guide. Each video relates to one small lesson, making approximately 140 videos in total. Students are able to see the technique being applied, helping them identify the tools that they need to use, and see the outcome of their actions. The videos can also be replayed to help trouble shoot if they have problems. These have been very well received by the students particularly novice users who report greater confidence as a result.

### **Learning styles**

The course design also tries to recognise the needs of different learning styles . In addition to providing information in several formats, words, images and videos, and integrating hands on practice with descriptions and explanations, the structure also allows students to approach the material in several ways. Sequential learners can move through the lessons in order, building the skills set and then apply those skills to a cumulative activity at the end of each week's work. However global learners, and those students who feel they already possess many of the skills taught in that week, can start with the weekly activity and refer back to the

lessons and videos for any particular skills that are unfamiliar. Each lesson, and the associated video, has been kept short and is restricted to one or two skills, allowing students to locate the required information quickly.

The materials are available in several media. Files for the activities, videos and all assessments are available for download from the course site on Moodle, the university's online learning management system. A print version of the Study Guide is available for students to buy and they are encouraged to use this option as the most effective way to work with the lessons and the activities simultaneously. However, we have found that many students choose to work from an electronic copy that can be accessed through Moodle. We intend to investigate the suitability of providing the Study Guide as a download for a tablet device.

### **Versions**

When providing learning materials for use at a distance, our strategy is to try to provide detailed examples and instructions to match as closely as possible what the student is seeing on their computer. Although we can expect a high level of success for students using the materials in the controlled environment of a university computer lab, it is impossible to achieve this goal with distance students who have so much variety in their individual home computer systems.

One of the great difficulties when dealing with so many students who are all using their own computer system is dealing with different versions of the software. Each version has a slightly different look and may use a different layout of the tools. They might even have a different way of achieving some tasks. Creating a chart in Excel is an example of a task that is performed quite differently in each different version of the program.

This diversity of software means that, regardless of how much care we take with the instructions and images in the Study Guide, for some students it will not match what they see on their screens. As we do not want to force all the students to purchase new software every time a new version is released, we have decided that at any given time we will develop the materials to match the most recent version, and we will also support the most recent previous version. We feel this compromise is reasonable for the great majority of students and also for the support lecturers who need to be conversant with all the different versions that we support.

### **Mac users**

One significant group of students who have computers that differ from our adopted standard are those who work on Apple Mac computers. Although Office 2011 for Mac offers all the same tools and features that we require for our students, the method of accessing or applying those features can differ significantly.

In 2006, when we started teaching CSU by distance, very few students identified themselves to us as being Mac users, and to a very large extent, those who did use Macs were sufficiently experienced with the computer that they were generally able to translate the requirements of our course to the features of the Mac. For the more obscure solutions, we provided an online discussion forum where more experienced Mac users posted solutions and tips to help each other.

However in more recent years we have observed that the number of Mac users has increased quite significantly. Each term we have between 40 and 50 students (approximately 12% of the distance cohort) who identify themselves as Mac users. Additionally we have observed that a significant number of those are people who have had some experience with Windows based computers and are using a Mac for the first time or are novice users purchasing a Mac as their first computer. These new Mac users do not

have the experience or expertise to adapt the instructions written for Office for Windows to use with Office for Mac.

As a result we have found it necessary to provide learning materials and lecturer support tailored specifically to this group. Students who nominate at their enrolment that they will be using a Mac computer are assigned to a designated 'Mac Support' lecturer who is provided with a Mac computer so she can see what the students are seeing and also to problem solve issues that are raised by the students.

We have recently adapted a full version of the Study Guide to show the techniques for Macs. This is provided only in electronic form available for download from Moodle. The number of students affected and the degree of the problem being addressed warrants the significant amount of time required to produce this guide initially and to maintain its currency in the future. However, the numbers do not warrant the additional outlay that would be incurred in producing it in hard copy. We have also not been able to produce videos for this group because of the substantial cost of time and resources that would entail.

The Mac users' discussion forum is still provided although it seems to be used less frequently than in earlier years, possibly because the Mac Study Guide answers many of the common problems. The postings to the forum now tend to be questions, with little or no input of solutions and tips from more experienced users.

### **Individual support**

In order to manage the large number of students in the course and also recognising the diverse needs of the students, we make extensive use of the grouping function available in Moodle. This allows us to release specific content on the website to a specific group. Each student, when they log on to the site, can see the contact details for only their own support lecturer. Lecturers can filter information to only show their own students and also manage the release of assessment items. This allows us to provide alternative opportunities to identified groups of students.

### **Fast Track**

One such group comprises those students who have self-identified as having more advanced computing skills. They are often already familiar with a certain amount of the content of the course and are also in a better position to quickly learn any new skills required. Many of these students express frustration at having to move slowly through the course content which has been designed at a level to support novice users.

In response, we have implemented an option for these students to work as Fast Track, that is, to work through the content and assessment at their own, accelerated, pace rather moving at the recommended study schedule. These students are given full access to the course learning materials and early access to the assessment but are not provided with lecturer support. Using the differential release options, Fast Track assessment items are available only to the students allocated to this group, and successful completion of each assessment releases the next assessment item. This system works very well for some students, with approximately 50 students a term completing all the course requirements before the mid-point of the term.

## **Conclusion**

Although there may be a general consensus in the community that 'everyone' uses computers these days, our experience shows that computer literacy is not universal and that many young people who are confident users of mobile technologies are not computer literate when it comes to standard computers and the sort of productivity skills that are required for university study.

The curriculum design of an enabling computing skills course such as CSU must address the needs of all students, from extreme novice users who lack experience, concepts and confidence when working with computers, through to students whose confidence and expertise with mobile devices can work against them developing computer literacy.

As a course undertaken by over 1000 students a year, primarily in distance mode, the learning materials are at the core of this course. They have been developed to provide an integrated step-by-step learning path for novice users, while also allowing more confident users to work at their own pace. Although the number of students is so high we believe that the essence of good teaching is to always remember that each student is an individual, with their own learning situation, skills, experiences and fears. Although we have designed our materials so that the majority of students can work independently with them, we also design them with the understanding that each student will work with the materials in a different way. This understanding has informed the flexibility and variety of the materials.

An ongoing challenge is to keep these materials up to date. Regular updates to the Microsoft Office suite of applications and to both Windows and Apple operating systems has always required corresponding re-writes of the course materials. However the current trend towards increased functionality of mobile devices such as tablets has created another area of potential change to both the content of the course and to the way that students interact with that content. Developing an understanding of our students in this changing technological landscape is a project that will continue to inform our reflective practice into the future.

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