Beyond E-learning Management Systems: screencasting for presentation and practice

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Abstract

E-learning management systems (EMS) such as FirstClass, Blackboard and Moodle have become firmly entrenched at many Australian tertiary institutions as the primary method of implementing e-learning. However employing a management system comes at a cost – development difficulties, staff training issues, student boredom, and the high cost of system itself – are commonplace. A less obvious problem is that for most instructors, the EMS itself becomes the exclusive access point to e-learning activities. If one also considers issues of organizational control, usability, accessibility, and cultural bias, there is a need for a method of instruction that goes beyond what EMS’s can currently offer. One solution is to utilize screencasting software in order to create both Web-based and standalone tutorials which may be viewed without the need for an Internet connection. A case study using Adobe Captivate to teach statistics and report writing is described concluding that screencasting offers a viable alternative to monotonous and repetitive website links.

Key words: e-learning, blended learning, screencasting, Captivate
1 Introduction

Over the past decade, Internet-based technologies have changed the face of education. E-learning is now a standard way of supporting students within training and higher education contexts and in some cases, the sole medium of instruction [20]. E-learning suits those students who prefer to work and study, and is being used by an ever increasing proportion of students who are disabled, and who originate from non-native speaking cultures. However, e-learning is not always successful, with a large number of professional and corporate e-learning projects failing due to technocentrism [9].

In Australia it has been financial pressure from diminishing funding resources which has driven the search for more efficient methods of program delivery. Thus both educational institutions and private enterprise have been turning to any one of dozens of course management systems such as Blackboard, FirstClass and Moodle for easy, user-friendly ways of providing online material for education and training purposes. The edutools website (www.edutools.info) lists 49 such course management systems reviewed over the last five years. A 2004 case study on the University of Western Sydney WebCT experience, shows more than 30,000 UWS graduate and undergraduate students used WebCT in more than 1,550 e-learning sites and that over 50% of all academic staff were using WebCT as part of their course delivery. There were an estimated 300 additional sites set up for non-curriculum uses including student learning skills development, research groups, student administration and staff development (http://www.webct.com/au_nz).

What is occurring in the Australian tertiary education sphere is a variety of blended learning whereby the traditional face to face mode is supplemented by teacher materials that are placed on an EMS site. References, notes, exercises, and other support materials are placed online for value-added student learning. The EMS often includes e-mail, chat, quiz creation modules, assignment drop boxes and administration tools. For the vast majority of academics the EMS allows them to create unit-specific websites without having to understand the intricacies of Web authoring. Normally technology-resistant academics are celebrating their newfound expertise as e-learning exponents; and while face to face hours have been reduced, students are consoled by the EMS as a substitute for missing teaching time [27].

1.1 Blended learning

Blended learning is a hybrid mix of traditional teaching methods and Internet technologies, mainly the Web. There are a range of benefits for incorporating online component for courses. For students – mainly easy access, convenience and minimal book costs; for instructors – faster implementation times, re-usability of resources, and feedback; and for the institution – cost savings in terms of printing and human resource allocation. It has been argued that these technologies have enhanced the economic viability of education and created a new part-time market for university courses – adult online learners. This in turn has created a different demographic of student with different needs and characteristics, which must be taken into account in the design of new courses. These students seek immediacy of course application, a sharing of life experiences as a source of knowledge, independence and self-direction, and ownership of their learning. Thus blended or mixed mode instructional models offer a compromise between traditional and fully online delivery modes, which can help meet the needs of adult learners [6], but can also disadvantage students from non-native cultures [3].

However, the mere substitution of traditional resources with an electronic version is not a guarantee of success with most educationists arguing for critical changes to paper-based documents for online consumption [22]. For centuries, traditional modes of delivery in universities encouraged relatively passive styles of learning. Students attended lectures and took notes, and were not encouraged to engage with the lecture material. Such passive learning techniques have been shown to be limited because they do not encourage students to fully process information [13], [24]. Blending traditional modes with experiential learning where students are required to apply theory to real-life situations in a dynamic manner, engages students in higher order thinking and encourages long term memory retention, as they personalise the subject matter [2]. But do EMS’s do much more than offer a location whereby instructors can place those previously passive learning resources?

The context of the learning environment has also been shown to be very important to the student learning experience. Various researchers have highlighted the importance of social interactions or the “human moment” to educational outcomes. While traditional online courses may deliver the factual material to students, they do not allow them to experience the more intangible aspects of the institutions such as sense of identity and community [11], [26]. And although access to information is an important part of learning, intellectual development has been shown to be largely achieved through active engagement and interaction with others [19], [15]. Many EMS’s offer social interaction components such as e-mail, bulletin boards and chat systems, but little research to date shows the adoption rate of such communication within the student population. Anecdotal evidence suggests that EMS e-mail, chat and bulletin boards are used by a mere handful of students unless instructors actively promote them by making such adoption an evaluation criterion.

It has been argued [7] that the increasing use of technology can have the paradoxical effect of compelling students to seek “high contact” situations with their peers, tutors and their institution while others [5] examine whether a blended learning approach alters the dimensions of relationships between students and other aspects of their learning.
learning experience and to what extent any enhanced sense of connection is attributable to the specifics of the blend. Other studies [23], [11] compared the experiences of both on and off-campus students studying the same course and noted that both sets of students commented on the social interaction aspects as positively enhancing their learning experience. The availability of communication spaces such as bulletin boards, text chat, video etc, not only augmented the spontaneity with which both sets of students could interact [23], but also allowed students to engage with a difficult topic outside of the class, reducing the feeling of isolation and disengagement that might be fostered even in a traditional classroom environment [5].

The composition of the blended strategies adopted is naturally dependent on the nature of what is being taught and needs to be pedagogically driven. One such case study [8] of a blended learning strategy was used in a course on introductory programming where historically students had problems dealing with the abstract nature of certain programming concepts. In this instance the instructors developed multimedia learning objects to enable students to engage visually with these concepts and hence overcome the problem of abstraction.

The use of such experiential learning techniques has been shown to be especially important to the teaching of statistical concepts [1], [28]. One study [16] argued that introductory statistics courses need to place greater emphasis on practical understanding by the use of exercises involving real data in order to motivate students and to develop the required skills of analysis and inference.

### 1.2 Problems with EMS’s

There are several concerns associated with EMS’s which also apply to e-learning models in general. The most influential shortcoming is the constructivist claim that most EMS’s do not comprise an appropriate social learning environment that demonstrably works in practice. Most EMS’s are about the accumulation, organisation, management and delivery of various forms of content. EMS’s are excellent at permitting HTML illiterate academics to publish Web content but this is insufficient for creating a real learning community [25]. Such a transmissive approach to learning is bound to fail unless there is also a way for students to discuss, debate and share ideas [14].

A remarkable summary of EMS problems [21] analysed a large-scale e-learning in a large Norwegian company. The researchers found six kinds of “disturbances” with the system: 1. Management control; 2. Technical problems; 3. Execution of implementation tasks; 4. Information sharing; 5. Allocation of time; and 6. Relevance to previous work. Information sharing between employees was identified as being especially problematic with a complete absence of understanding by management that individuals needed to share their knowledge, ask questions and receive feedback.

For all their ease of use and simplicity, EMS’s still require effort on the part of the instructor to learn the various modules available. Varying user platforms, different EMS’s and new versions of the same EMS add even more complexity for overburdened academics wishing to ensure their course is as up to date and as technologically savvy as other units. A common occurrence is the use of ordinary Word documents which are placed on an EMS as the e-learning resources for each week [18]. For some academics this constitutes the range and extent of their foray into e-learning. Personal experience with WebCT has shown that if those documents comprise added graphical elements such as photographs, or tables, there are often technical problems in saving these totally complete files. This has resulted in students being unable to read or review course materials unless they are sitting in front of an Internet-enabled computer.

Such usability issues are a recognised issue by some researchers, with similar usability problems that afflict Web pages also affecting EMS pages. One recompense of EMS’s is that they are not usually over-laden with graphical elements such as those eschewed by Jakob Nielsen and his advocates. One study investigated usability issues and concluded that the use of a usability expert after a course has been created was ineffective and insufficient [18]. What was needed was a user-centred design approach from the beginning of the course’s production. This is in fact a philosophy which places the person, rather than the e-learning object being created, as the focus. This philosophy focuses on such cognitive factors as perception, memory, learning, and problem solving, as users interact with the object being designed. It requires an understanding of the potential users’ goals and expectations, their needed functionality of a site, the content matter, abilities, tools, and access context [17]. From personal experience, only a few academics employing EMS’s to teach tertiary courses go to such lengths.

The accessibility of EMS’s is usually reported as meeting the standards of the W3C accessibility checklist [12]. Such issues as descriptive Alt tags to describe graphics, text transcripts for audio and video elements, and links with descriptive names are the main considerations for most commercial webmasters and their institutional counterparts. However some research has shown that WebCT, and other heavily java-scripted pages are not easily navigated by sight-impaired users who utilise the popular screen reader program, JAWS. The research [4] employed the services of a completely blind expert user of JAWS from the Australian Society for the Blind who concluded that the EMS navigation and menus provided unnecessary confusion and dead ends – just finding course information on WebCT was unnecessarily difficult and occasionally impossible. Apparently very few EMS’s or websites in general are tested by disabled persons. Their self-evaluative marks of approval pay lip service to accessibility standards but reality is quite a different matter.
An unrecognized problem with using standardised methods of creating online materials (viz. EMS’s), is the issue of cultural accessibility. Cultural accessibility is a website’s potential to attract, to be understood, or to be used by members of other cultures. Just as certain website designs may mitigate against users who are sensorially, cognitively or physically disabled, EMS’s may also varyingly attract or repulse some cultures more than others [3].

2 Materials and Methods

The method used for the study was a case study utilizing action research which considered observation, student feedback, staff comments and reflection. Action research is defined as an iterative method of understanding and acting on particular issues in educational settings, and constitutes an effective tool for teachers wishing to constantly improve their work and to share findings with others [10].

The first year subject, Communication Research is a core unit in the University of Western Sydney’s Bachelor of Communication program. The unit introduces the modern process of communication research including critical review of research literature, argument and logic, data collection and analysis, writing the research report and research ethics.

Communication Research classes consisted of a one hour lecture and a two hour workshop which are typically held in the university’s computer labs with the aid of a specially developed website where exercises, readings and activities are posted weekly, accessible by students both from within and outside the university. The website also has a built-in bulletin board for staff-student and student-student communication and is regularly updated with other materials such as PowerPoint slideshows which are created by the teaching staff.

Regular weekly classes ran for three hours in 2004, but this was reduced to two hours in 2005 to 2007. The lecture component was deleted due to unit standardisation across the University. The format of the workshop was as follows: a range of traditional face-to-face discussions and explanations with students seated around a tutor who used workbook exercises; and activities on the Web where the students went back to networked computers and the tutor instructed the class, highlighting particular concepts, then allowing students to proceed individually, while moving around the lab, giving feedback and assistance where required.

In 2004, the statistics program, SPSS was taught to students in a traditional chalk and talk manner. Lectures were used to show students the intricacies of the method of analysing data. Computer workshops were used to enable students to practice using SPSS with dummy data. Tutors spent all their teaching time answering individual student queries and giving students the confidence to proceed to the next logical step in the process of using the SPSS program. However, once the students pressed the right keys to obtain statistical output, they had no idea of what the tables and graphs actually meant.

In general, most Communication students are verbally-oriented and find statistical principles difficult. The notion of using SPSS was not only to give them a tool to make analysis of the data easier, but to teach them how to make critical sense of statistical jargon and published results. While they grasped the idea of survey writing adequately, their findings tend to be more descriptive than analytical. They lacked the confidence to experiment with the program and to take risks in speculating on the results.

The EMS available at the time was WebCT and was of little use in helping students to gain confidence in their use of the SPSS program. While a great deal of information could be placed online, the students needed a way of building skills and confidence with entirely new, and very alien statistical concepts embedded within an equally new user interface.

3 Findings

3.1 Captivate as an alternate e-learning teaching method

Adobe Captivate (formerly Macromedia Captivate and RoboDemo) is a relatively new program which has been generically grouped under the “screencasting” genre because it allows screens to be captured and re-used. This program allows an author to assemble screen captures, sound and video into a single, user-controlled animation. The author can add captions, graphics, sound, buttons and a range of other interactive elements without having to have specialized programming knowledge. The animation can be saved as a native Captivate file or exported to a Flash file. It can then be placed on the Web, on a Flash drive or on a CD-ROM. Captivate’s main competitor is a program called Camtasia, however Captivate is much more flexible and enables the creation of quizzes and complex branching scenarios.
Captivate is currently seen as a training tool, especially for software and online application training because screen captures can not only simulate use of the application, but also identify critical parts of the process for the novice user. Users cannot go astray within a Captivate demonstration; they cannot choose strange or illogical pathways, and through repetition and practice they rapidly become familiar with the previously unknown user interface.

In 2005 and 2006 (student intake around 250 per year) Captivate was employed to record SPSS tutorials that allowed students to interact with a series of simulations that simplified the intricacies of the SPSS process. Five tutorials covered data entry + running basic frequencies and graphs job, a T-test, a correlation analysis, a more complex ANOVA procedure and creating specialist tables and graphs using SPSS output. How to interpret the findings was also included in all these tutorials. Tutors encouraged students to view the Captivate tutorials at their own pace and apply what they saw demonstrated on the screen to their own usage of SPSS with their own survey data (see Figures 1 and 2).

![Figure 1. Sample screen shot of the 'Introduction to SPSS' Flash Tutorial](image)

Observation, evaluation of student assignments and student feedback revealed that the Captivate tutorials enhanced confidence in using the program and allowed students to proceed without resorting to questions every step of the process. The tutor’s role was no longer one of helping students to enter data and answering anxiety-laden procedural questions, but more one of trouble-shooting and suggesting various statistical tests to perform on student data. Students easily mimicked the Captivate examples of a demo survey using their own survey data and started confidently using the descriptive statistical parts of the SPSS program.

From evaluation of the final student reports it was obvious that there was still a problem with creatively applying the SPSS program to investigate hypotheses inherent in the student surveys. Student research report results sections showed vast improvement in their descriptive reporting of the survey items. Similarly, graphs and tables were used to show basic frequencies and reveal trends. What was problematic was any attempt at analysing relationships between survey variables. Thus, use of T-tests, correlations, or ANOVA was totally absent from student reports, even though the Captivate tutorials had supposedly covered these procedures. The missing element in the student imagination were statistical concepts such as significance levels, probability and testing procedures.
3.2 Captivate as an instructional writing tool

In 2007 use of Captivate was extended to depicting the process of research report writing. Given its graphical and thematic capabilities, a black and white Gothic theme was chosen in order to attract students away from computer lab classroom distractions such as MySpace and Facebook, at least temporarily (see Figures 3 and 4).

The tutorials were then used in the two hour class to present the process and content of report writing. Tutors used the Flash animations as a sort of glorified Powerpoint. Instead of simply allowing students to go through the materials at their leisure in the computer lab and at home, tutors directed student attention and highlighted particular aspects of the tutorials. The benefits of this process of using online materials as both teaching materials and as practice/homework were threefold. First, all students were assured of viewing the animations together with the tutor’s extemporaneous further explanations missing from most EMS materials. Second, students could ask questions about the information and receive immediate feedback. Third, exercises could be inserted for the classroom and for home practice. Obviously, absent students had to contend with the Web-only viewing, but this process of using online Captivate tutorials for both classroom and for future student practice meant that the materials were viewed at least twice, often more times, ensuring that students came to terms with the content of the unit.
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Figure 3. Menu screen for 'Introduction the Research Report' Captivate tutorial

Figure 4. Example of the Introduction showing "bubbles" which highlight important sections

Evaluation of final student reports reflected this enhanced practice with both SPSS and with the research report showing marked improvement from previous years’ assignments. Students again mimicked the Flash tutorials in terms of report structure, use of social science/statistical jargon and employment of graphs and tables. Higher order analysis of survey data variables however was only marginally improved since the original survey designs were performed by novice student researchers with little supervision. (Ascertaining real-life findings and creating first-rate surveys was never the aim of the course.)

The current response to the Captivate tutorials from staff and students alike has been unanimously positive. Comments from end of semester evaluations included the following: “the Flash tutorials were wonderful… made using SPSS a lot smoother”; “if you were absent from class you could still catch up”; “learnt a lot of valuable information through the Flash tutorials”; “really liked the atmosphere of the Flash tutorials”. Staff teaching the unit have also appreciated the standardised way of delivering course content and skills practice.
Recent experience with the new Captivate 3.0 has revealed several unexplored functions such as the ability to add multiple choice quizzes to the Flash tutorials. Students can thus be directly evaluated in terms of educational outcomes and unit aims. Such quizzes could also be used for drill and practice tasks in certain subject areas. The new program also has enhanced audio/video functionality. This potential to engage students with video, and audio is applicable to a conceivably large range of other training/learning tasks, from forensic science and management skills to medicine and dentistry.

4 Conclusions

EMS’s have become de rigueur amongst tertiary institutions and many corporations in Australia. In many ways, not implementing an EMS is regarded in the same way as not having a website - inefficient and anachronistic. But there are many issues with EMS’s that need to be considered before licensing the latest release of any online learning product. On the surface, whether the EMS provides educational value for money should be a prime criterion, but this seems to be a difficult task given the lack of institutional study in this area. Once an EMS is selected, the institution is locked into maintaining that system since all of the teaching staff and students have become entrained into a particular style of e-learning.

The Communication Research unit’s main aim was to introduce empirical research so that such research could be critically evaluated and conducted in later years. Few other units in the Communications degree confront undergraduate students with a program such as SPSS, and with research methods that are usually reserved for postgraduates and academics. Teaching staff found that, contrary to popular academic beliefs, research is not the sole province of Third Year, Honours and Masters degree students. SPSS is a challenge for students at any level whether it is undertaken during First Year or at the doctoral level. Captivate made that challenge significantly easier to overcome for the vast majority of students in the unit.

Rigorous research into online training/learning using such programs as Captivate is severely lacking in the literature. It is hoped that such standalone programs can be compared with EMS learning and also traditionally taught units. Such research should provide the fertile ground for new theories of e-learning, blended learning and training.

In terms of e-learning, Adobe Captivate represents an alternate tool beyond the current usage of EMS’s. While most academics simply upload and hyperlink their Word documents, Captivate permits instructors to storyboard their e-learning activities and utilise artifacts of video and film. Instructors can customize the look and feel of the tutorial to create thematic and narrative experiences for students who are thoroughly bored with website links and Word documents. Finally, teachers can now compete head to head with the sensory appeals of mainstream media and the Internet by using Captivate’s animation and multimedia possibilities.

Certainly the new online functionality also requires new skills with instructors needing to acquire camera, audio and directorial expertise. Ordinary teaching will need support from technical specialists who can assist multimedia production. Dissenters may argue that by catering for student needs we may risk treating them as mere consumers of education. Advocates would say that we are giving students the respect they deserve. There is a brave new world of e-learning awaiting us, where students’ humanity, their collective motivations and audience needs, are given the same priority as that afforded the general media public.

References


