

# **“Amazon.edu”: Creating Interactive Distance Education**

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## **Abstract**

*This paper endeavours to determine some of the definitive functions and roles of DE, and further, to relate those characteristics to fundamental concerns with the contemporary DE process. The authors discuss current use of web technologies in DE delivery, and relate a case study of web technology use in contemporary business. The authors argue that principles evinced from this example could be embraced to create new methods of DE delivery using contemporary web and Internet technologies. To ensure the successful deployment of web-based technologies in education a strategic, essentially user-centred, focus is necessary.*

## **Keywords**

Distance Education, WWW, Internet, Distance Learning, Learning Environments

## **INTRODUCTION**

Frequent use of the web and associated technologies is an accepted, if not habitual, part of business and social interaction. School children as young as five years old now learn to send e-mail, workplace intranets are an essential business tool for both the conventional “white collar” employee and also those employees traditionally engaged in “non-office” type activities, and consumers are now able to shop not just within the confines of a shopping centre, but among the plethora of virtual stores on the web.

Similarly, the WWW also functions as a critical research and teaching tool, from primary through to tertiary education. On-campus university students are expected to utilise the full capabilities of the web in their day-to-day study, whether it be for research, obtaining all their essential unit materials, or learning how to develop sophisticated business systems. Students who choose the perceived “convenience” of distance education (DE) have similar expectations placed on their learning and they in turn place demands upon the university to provide increased services in order to ameliorate the differences experienced with distance study.

The authors contend that contemporary DE practices are failing to address fundamental concerns with the delivery of DE, in particular the many web based teaching programs currently promoted as “e-learning” to distance students. Many education providers assume the simple replication of existing, and inherently flawed, DE practices will suffice. Fuelled by the mythic status of “e-learning”, perhaps the most destructive of hype confuses the message (fundamental content) with the messenger (the Internet) assuming that by imbedding traditional content material in an electronic environment the resultant product is magically transformed into education at a distance. This paper will discuss new technologies and their possible implementation in the DE process, in order to address fundamental concerns to create a much more engaging and successful learning experience.

## **CONCERNS WITH CONTEMPORARY DISTANCE EDUCATION**

Conceptually the frameworks with which we describe DE have undergone a substantive transformation, as methods of delivery have increased in sophistication, and the causal motivations for studying by distance have become less straightforward. As McGill and Hobbs (1996) highlight, ‘...students may enrol externally due to their physical distance from the university, or because their work or family commitments make it difficult to attend regular classes’. It is clear that geographical constraints were once a defining impetus for choosing DE as a mode of achieving degree or certification, however for many students these study units now provide primarily an entry into standard on-campus courses.

The evolution of technologies has similarly mediated a shift in conceptualising the DE process. New communications technologies mean that the conventional separation of teacher and student is of only a physical

nature, no longer encompassing the emotional meanings by which its use hitherto implied. These shifts in the contemporary DE environment have thus attempted to redefine our previous understandings of distance learning.

As a result definitions of DE are both plentiful and varied. Alan Carswell (2002), Linda Carswell (1998), Lawhead et. al. (1997), and Jones (1996) all list defining characteristics of DE. Some focus on the pedagogic traits, others on technology, and some on motivation. Butler and Blashki (2003) summarise contemporary research, emphasising the fundamentals of DE as learners not attending normally scheduled classes, including lecture, tutorials, lab sessions, and the like; using some method to replicate the material covered in these classes, be it print or electronically based materials; and learners pacing their study of the material and the process themselves.

Butler and Blashki (2003) also highlight that despite pedagogic innovations the “classroom”, primarily the tutorial, remains the environment where significant interactions with staff and the student’s academic development occurs. It is here the student reflects on the material introduced in lectures, becomes involved in discussions of key concepts and areas of special interest, completes study exercises with the support and feedback of tutors and fellow students, and importantly may obtain help when required. By definition and practice the distance education student does not attend these tutorial classes. As a result the many opportunities for engagement with the subject material become difficult, if not impossible, to obtain.

Similarly, spontaneity in the learning process is difficult to achieve in a DE environment. Although the distance student may study when they choose, it is difficult to deviate into areas of interest not covered by the supplied material. It is often these deviations that facilitate a more thorough understanding of the conceptual ideas underpinning the unit. A tutor may exploit the opportunity to deviate into a discussion of troubleshooting techniques when a student’s program does not work, developing the student’s comprehension of the material at hand. A distance student may be wary to stray from their study guide in fear of moving too far from that which is essential to the unit. As a result, the DE experience for the student may comprise merely frustration.

Regular and timely feedback is a foundation to successful comprehension of material, regardless of discipline. This feedback may comprise a simple answer by e-mail or looking up answers at the back of the text, or more complex interactions involving higher order synthesis and analysis of the teacher’s response. For many questions, feedback is required at a specific time. A distance student may be unable to continue without a key issue being addressed such as finding a small bug in their code. For the on-campus student the tutorial environment provides a response; a fellow classmate might point out the error or the tutor may provide the explanation required.

Whilst readily acknowledged as significant problems within contemporary DE study, such issues are deemed to be an unfortunate but inherent consequence of DE and thus fail to be remediated within many DE frameworks that exist in tertiary education institutions. These concerns may have been accepted as regrettable by-products of distance learning in the past when printed materials formed the basis for study content however, given the sophisticated technologies used in many other facets of teaching, training, entertainment, and business, why is DE lagging behind?

## **THE CURRENT STATE OF INTERNET TECHNOLOGIES, THE WEB, AND DE**

The development and application of web and Internet technologies has been particularly rapid in the last 10 years. There are technologies to support almost all facets of contemporary business, as well as home entertainment and shopping. Such technologies have also been embraced to varying degrees for use within DE and computer-aided learning. As Wade and Power (1998) indicate “flexibility, ubiquity and cost of the technology have often been cited as strong motivations for its use”.

These technologies range from the simple to the extremely complex. Content creation applications, such as Macromedia’s *Dreamweaver* allow users to easily create both basic and more sophisticated web content, with people of all ages and skill levels readily and eagerly taking up these tools. Creating a web site is now as simple as creating any other basic document, with the myriad of personal web sites being testament to this. Companies are also exploiting this ease of content creation to provide ever-increasing levels of creativity to the user. The Macromedia MX suite of integrated products can be used to develop sophisticated web applications of interactive graphics using *Flash*, encompassing dynamic database content derived using *Cold Fusion*. Whilst such applications are designed to enable increasingly complex content creation, there is also clearly an aim to ensure the process is as intuitive and simple as possible for the user. A “designer” need no longer bother with the acquisition of difficult programming languages to create content, much of it is as simple as “drag and drop”.

Along with these relatively simple tools there are also scripting languages such as ASP and PHP. These languages are closer to the pure programming concept of previous decades, and as a result enable the creation of

high level web applications with sophisticated integration to databases. "Cookies" also enable a degree of personalisation, and technologies such as SSL can ensure the security of transactions.

How have these technologies and systems impacted on DE? Wade and Power (1998) succinctly summarise the impression left by these innovative technologies by highlighting that despite huge growth in these technologies, as well as in the popularity of web-based systems, "efforts have been very variable in both effectiveness and comprehensiveness".

This problem with effectiveness emerges from two distinct, but nonetheless related, concerns with contemporary DE. As Jones (1996) suggests, DE is characterised by 'use of media, often print based, to carry course content'. Thus, the development of DE material does not always reflect the content offered to on-campus students, as on-campus course content is rarely solely standard text-based media. Depending on the course and university, this content consists of anything from printed matter, electronic notes, as well as the lectures, studios and tutorials. How can these be replicated for the distance student? Streaming lectures certainly exist, but an often 2-way communication channel has been severely impeded.

Given the plethora of available tools and the apparent lack of development in pedagogic methods, Garrison (2000) questions '... whether distance education possesses the theoretical foundation and commitment to take it into the 21<sup>st</sup> century'. Such insights suggest also that we are failing to exploit the potential of the technologies available for DE, by neglecting to assess our educational pedagogy in the development of new methods for DE. Unfortunately the extent to which technology has been utilised is primarily in the replication of existing DE processes, merely replacing one medium with another. University websites simply house materials that were previously posted out by mail, while communication channels such as e-mail and online chats often just take the place of a phone call. Such practices fail to accommodate the real potential of new technologies.

Although systems such as WebCT certainly provide a positive step toward invoking the power of new technologies, actual usage typically encompasses standard practices, so that ultimately it provides neither a satisfying educational experience to the DE student, nor addresses some of the fundamental concerns expressed by the DE student. The student still undergoes an impersonalised learning experience based on DE methodologies of the past. To examine this deficiency we can use a simple case study. Amazon.com, arguably the world's largest online store, can be used as an example to highlight these concerns in current practice.

As a customer the user has many experiences that make their visit to Amazon a unique one: a cookie on the user's PC ensures that when the customer returns to Amazon they are greeted with a personal welcome and a tailored home page. There is their wish list, items the customer has put aside for the next order, and they may be offered specials tailored to their preferences as well as suggestions by other Amazon customers. The customer may also add their comments to a product in the catalogue. When the customer wishes to purchase goods, they may choose the "one-click checkout" and have the order placed in a matter of seconds. Throughout the visit recommendations are offered, premised on previous visits on a page dedicated to their interests. Certainly economic motives are a basis for these selections, however they are also based on the history of the customer. Although one of a million patrons, the Amazon customer is treated as an individual. In the world of DE however, the distance student typically follows the same learning path as all their peers.

Amazon.com might also be usefully employed as an example of the ways in which the issues of feedback, spontaneity, and flexibility could potentially be addressed. In the DE environment, feedback on submitted assignments, or completed study questions, from lecturer, tutor, or even peers may happen weeks after submission, if at all. In the world of Amazon.com, any uncertainty about a particular item can be quickly alleviated (or affirmed) by reading the myriad of feedback from the Amazon staff, other reviewers, or customers that purchased the product.

Spontaneity and flexibility are similarly provided for at Amazon.com. Uncertainty could be assuaged by looking at recommendations offered by Amazon. These are not merely ad-hoc suggestions, but rather, purposefully linked to previous purchases. The customer also has the ability to branch out into areas not previously encountered yet still relevant to their areas of interest. In comparison, within the confines of a DE environment, a student may wish to move into territories unknown, yet can expect little guidance as to the relevance of the given topics.

Current implementation of relevant technologies into contemporary DE frameworks has failed to address these critical issues. Simple replication of established techniques has typified current DE practice. Garrison's (2000) concerns that the long-standing theoretical foundations of DE are impeding any pedagogic movement into the 21<sup>st</sup> century are proving to be valid. Delivery of DE continues to be premised on foundations decades old, flawed foundations easily remedied using contemporary technologies. Integration of these technologies and practices into a distance learning environment could radically improve the experience of the distance learner.

## USING WEB TECHNOLOGIES TO CREATE A MORE SUCCESSFUL LEARNING ENVIRONMENT

Creating new learning environments may facilitate an increase in the flexibility, spontaneity and feedback experienced by the learner at a distance. As suggested earlier, an educative experience is being demanded by students that can offer a more immersive environment, is intelligent, and can appear to offer an individualised experience. A learning environment embracing the ideals discussed could achieve this for the student.

Such an environment could be created from a diverse range of technologies. Many sophisticated programming technologies might be used to produce learning environments that could address the concerns raised. As DE attracts students of varying ages, countries, experiences, and technological sophistication, web technologies could prove to be the ideal tool.

The very nature of many web technologies could facilitate equitable access and effectively negate the differences between current student learning environments. Contemporary corporate web activity illustrates this: companies on opposite sides of the globe conduct business seamlessly, consumers order and track goods from virtually anywhere in the world.

Technologies such as Java and Microsoft's "dot Net" development framework create applications and systems that are platform independent. HTML only necessitates browser software on the user's PC, usually part of the computer's operating system. More sophisticated web technologies generally require the installation of a small plug-in, and the notion of client-server (such as many database driven applications) is that a server at the other end, not the client, will be doing the bulk of the work, hence requiring little explicit software installed for the student. Such innovations ensure the web technologies are effective and appropriate for creating distance learning environments.

The "intelligent" capabilities of these technologies suggest potential web environments that are far more advanced than the current ubiquitous use in DE, that of simple delivery of course material. Database technologies allow for key information to be stored on each student: personal details, test results, and other key information that can be used to create the personal experience on the database driven web pages, just as at Amazon.com. The database information, along with many pre-defined rules programmed into the environment, could create the dynamic study plan. Scripting languages can be used to mark student tests "on the fly", providing the immediate feedback required. The potential of B2B driven technologies such as XML to even further enhance the learning environment is yet to be imagined.

Simple application of these technologies, along with Amazon.com principles, could create a web-based learning environment that provides greater individualisation as well as affording opportunity for feedback to the student. Butler and Blashki (2003) began to highlight how these ideals could be applied, providing several potential examples. The student logs in, to be greeted with a personalised welcome message, the latest unit news, and a reminder that the next assignment is due in only a week. They are also presented with links to this week's study materials, and notified that the feedback for assignment one is available to them. This is achieved quite easily; using a combination of the cookie on their PC, along with some information in the unit database indicating where the student is up to, what news is available to them and their assignment feedback.

Further example could provide the student with even greater support. The student may access a study plan page where a suggested study plan for the next month is recommended. This would be different to that of other students as there is information stored in the database indicating the student did not perform well in the test for the last topic. Indeed, in light of the student's past performance they would not yet progress to certain topics. The student is then directed to revision material and completes the end of topic test. After being automatically marked, the student is directed back to material that they had trouble with, as well as being offered some supplementary exercises. The study plan is revised and has now altered considerably from only several hours earlier. The student will also hear back from their tutor offering assistance on content that was problematic, as relevant staff are notified of the student's performance.

Whilst simple and readily achievable, the most frustrating thing for the distance student is that such a basic process is one they may access in other facets of their life. The parallels to Amazon.com have been discussed, yet other applications that use similar methodologies and ways of thinking are also readily available. An organiser such as Microsoft *Outlook* affords the user an overview of the important items for the week, informing them of work management and status. Many Management Information Systems (MIS) provide similar overviews and allow the user to focus on information relevant to their individual needs. Many database applications are based on this ability to specialise the information offered.

The technologies to create these learning environments are easier to use than ever before, however few students have access to such innovation in the pursuit of their education. Innovation that can address the cornerstones of student concerns with contemporary DE, namely personalisation, spontaneity, feedback, and learning patterns.

Similarly, exploiting the technology to its full potential in an educational environment ensures the creation of distinct learning environments for each unit the student studies. With current DE approaches a student can study programming, accounting, marketing, education, and even science, and undergo identical methods of learning for each unit, despite the obvious divergent nature of each. Since these units are all taught with different approaches on campus, why then are they not differentiated when studied at a distance?

A common environment framework can exist for distance education, however the content combined with the dynamic nature of the environment would create a distinct learning experience for each unit studied. The “intelligent” nature of such an environment could also ensure the student has a unique study pattern for each unit, a plan based on past results and current performance.

## **FUTURE DIRECTIONS**

The aim of this paper is to acknowledge both the issues that plague contemporary web delivery of DE, as well as highlight suitable technologies and possible implementation for its delivery. The authors advocate the creation of a distance learning environment, an “Amazon.edu”, for distance students. Such an environment would embrace many of the ideals and successes of contemporary web-based activity, yet also address fundamental student concerns with DE. The purpose of such an application is not to create a competitor to the many web-based education delivery frameworks that already exist. It is to simply highlight that some basic consideration of DE flaws, along with acceptance of contemporary business thinking can lead to a more successful delivery of DE.

Such an application is the focus of research at Monash University, with the fundamental framework being developed. This framework provides most of the functionality as discussed in the student scenario in the previous section. Students log on and receive an overview of their course. This overview (Figure 1) includes a menu of enrolled units, course news, and assignment reminders for their units (dependant on due dates and submissions). The course screen also contains links to many generic course functions.

The student is able to access specific subjects in which they are enrolled, and are greeted with a subject overview (Figure 2). They have access to general unit news, personal news, assignment reminders, and a summary of their current topic. There are also a number of menu items, such as links to subject topics, unit information, forums, and lecturer details. The key items include a feedback page, where students can read the feedback on assignment work, as well as receive advice on additional study questions based on this feedback and performance. There is also a study plan page where students see all subject topics, their relationships, and what their logical topic progression is, again based on past topic performance.

Further work will involve testing and benchmarking of the application, as well as expansion of features for both students and academics. As highlighted, the object of this environment is both to immediately create a more successful learning experience for distance students, yet to also function as an interim measure to creating a complete environment: an environment catering to as many DE issues as possible, whilst still retaining the trademarks of DE that make it the mode of choice for many students.

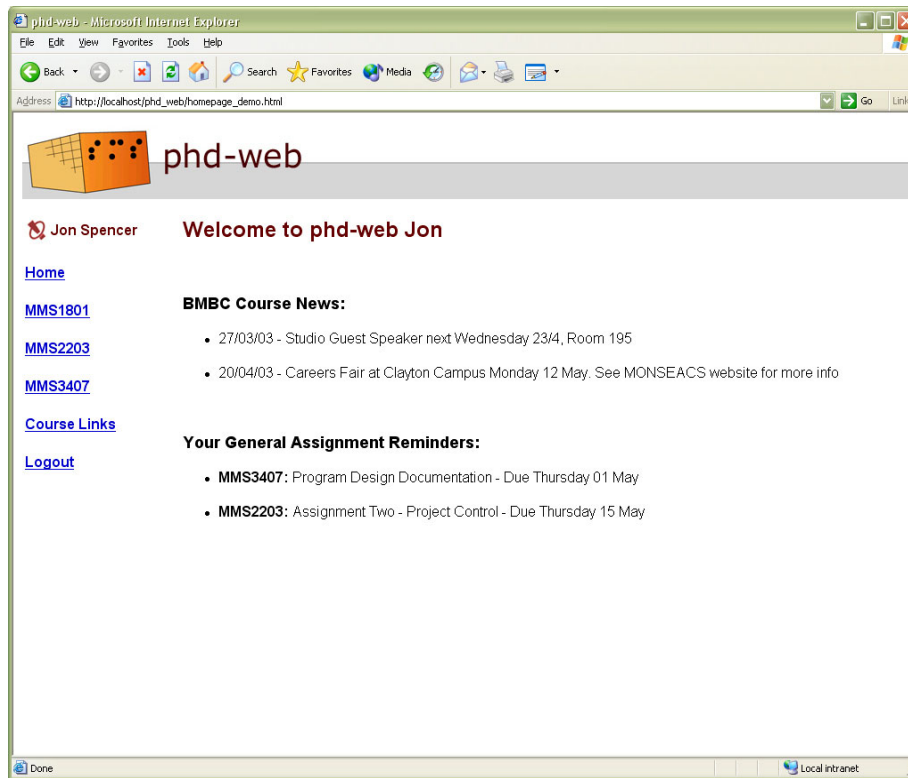


Figure 1: Student Course Overview Page

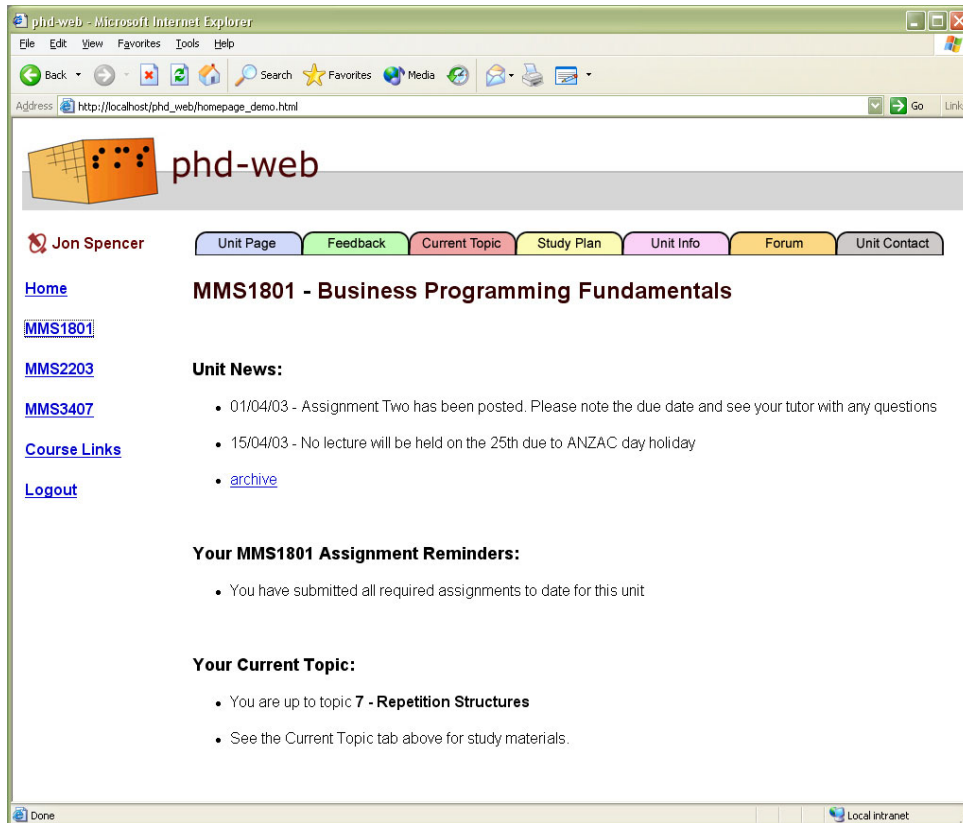


Figure 2: Subject Overview Page

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