2008

Academic Initiatives and eLearning

How companies can improve academic initiatives with the help of eLearning

This paper is intended as an overview of the possibilities and effects of incorporating eLearning in academic initiatives as a mean for giving technical courses to university students.

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2008-04-01

Abstract

The IT students that graduate today will be the IT industry's employees and possible customers tomorrow. Today universities can lower costs by joining academic initiatives that allow them to leverage limited educational funds more efficiently while still providing a high quality education. One reason that these initiatives exists is that they can help companies get students interested and aware of their products. Some companies don't do this and it will in the extension lead to students becoming used to other systems that are more widely available to them at schools and on the internet and habits are hard to change. The academic initiatives available differ in quality, implementation and availability. Today there is a very limited amount of material and research to be found on what differs between them, and how they can be improved. One of the most promising parts of the solution that is provided by companies like Sun, IBM and Microsoft is eLearning. These companies provides some of the most mature solutions to be found on the market today and will be used as examples throughout this paper. The problems that still exist can be solved in several ways and some of the methods of improving quality and availability will be presented. Companies without an academic initiative that involves online courses will benefit from reading this paper by gaining insight in what will be expected from a functional perspective, how to avoid common pitfalls and thereby helping them succeed in their own academic initiative efforts.

Keywords(*Academic Initiatives, ROI, knowledge transfer, education, evaluation methods, mindshare*).

Introduction

The use of the World Wide Web as a way of spreading knowledge and as a platform for education is increasing. Certain attributes of the World Wide Web that have fueled the explosion of learning opportunities include: capacity to enable sharing of rich media files (pictures, complex diagrams, video, audio); and interactivity of electronic communication in user-friendly modalities such as email, bulletin boards, and simultaneous chat rooms, as well as more bandwidth intensive forms of Web-enabled video and audio teleconferencing (Frydenberg, 2002). These are all ways of transferring knowledge in a very scalable and cost efficient way. In a software and hardware company perspective this is both an opportunity and a problem as the market increase but also the competition. With the World Wide Web innovative startup companies can market and distribute their technology and software faster and cheaper then has ever been possible before. This can lead to declining market share for the traditional industry giants if no action is taken. In a market with broader availability of choices many universities seeks new solutions since they have limited budgets and are therefore unwilling to invest substantial amounts of money in software and hardware. The ranges of courses that are available on

universities differ but often focus on what they can provide on their own. Usually this means using software that can be gained legally for little or no cost. They can use proprietary software, often subsidized or discounted by the software companies or open source which can be gained for free. Buying complete courses from outside companies is seldom an option. For companies to reach students they need to solve this by giving access to their technology through collaborations and agreements with universities. Big software companies often offer courses and training to its business customers either directly or through partners. The difference is that business customers are more willing to pay for sending employees away for training which results in flight, hotel, and other costs which students themselves can not afford and universities most often don't have incentives enough to provide for their students. This opens the door for distance learning as a viable solution. If companies can offer courses through eLearning that would lower the cost as the students can stay at home or school and the lectures can be recorded once and then streamed over the web at any time. This also simplifies scheduling as the lectures and labs are always available and the students can manage their own schedule. There are many eLearning software solutions on the market and some companies have built their own to be able to integrate better with their systems. Some universities also have their own eLearning platforms that they use to give distance courses. Integrating company systems with all these different platforms used by universities would create large amounts of work and costs. This paper will use IBM's, Sun's, and Microsoft's eLearning offerings to see how the different academic initiatives succeed in creating usable and available eLearning solutions for students. A scenario-based approach is taken to evaluate the presented solutions. Each solution will be graded by the following topics: Usability, content, functionality, distribution, and costs. Each company presented has more than one official solution but not all are available worldwide. Only one of the versions from each will be used for the evaluation and they are all internationally available. The final results and proposed refinements are summarized in the conclusion that can be found at the end of this paper.

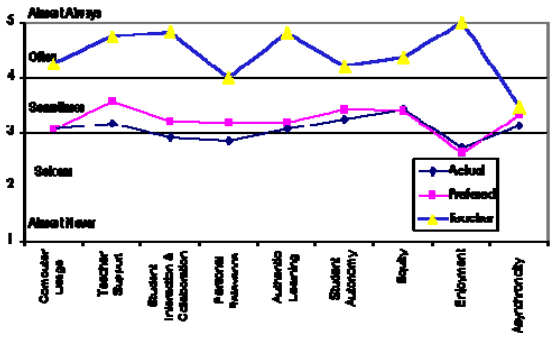
Research Method

Researchers in this field are limited by the lack of official data on knowledge-transfer and amount of built mindshare directly resulted from academic initiatives. These are trade secrets kept strictly in-house. To precede without this data the paper will be framed and executed as a literature review with some basic scenarios and example evaluations from real-life solutions. These are qualitative data collected by applying scenario-based usability inspections. Comparing the amount of books published on each technology that are present on Amazon will give a relative measurement of the mindshare connected to each product or technology.

Literature Review

Evaluating eLearning

Many factors influence the learning experience. These include the infrastructure, quality of content and assessment, quality of learner support systems, assumptions made by learners and educators about the learning experience itself and peer support networks for learners and educators (Macnish, Trinidad, Fisher, & Aldridge, 2003). Developers that work with eLearning systems wants frameworks that can help them improve the quality of their software. There have been efforts to find a standardized way of measuring and evaluating eLearning systems. A systematic approach is the IEEE Learning Technology Standard Committee (LTSC) reference model, IEEE P1484.1 LTSA. This model has five layers, which focus on reusability and portability, and compares different e-learning systems by numerical rating scales for various factors, e.g., assessment, administration, curriculum development, etc. (O'Droma, Ganchev, & McDonell, 2003). Another is the use of the ISO 9126 Quality Model proposed by Chua and Dyson (Chua & Dyson, 2004). Unfortunately the material in this standard has some limitations as it can not be reproduced without a specific permission from ISO (ISO - International Organization for Standardization). A further limitation that apply when doing evaluations of outside eLearning solutions occur when quantitative data like statistics of enrolled students, rate of enrollments for courses and student satisfaction is considered to be company secrets and not available for the public. This is especially relevant when evaluating systems that are operated and run by the companies themselves. Another way of collecting data is the use of the Online Learning Environment Survey (OLES). The online learning environment survey (OLES) (http://www.monochrome.com.au/oles/survey.htm) is a dual format instrument where students are asked to rate the 'actual' learning environment experienced in a module (subject) with their 'preferred' learning environment using a five point rating (Almost Never, Seldom, Sometimes, Often, Almost Always) for actual and preferred items (Trinidad & Pearson, 2004). The instrument provides a feasible way of using surveys to gather data from students and produce charts, diagrams and tables to present the results from student taken the surveys. This makes it easy to find the areas where improvements are most critical. An example diagram shows how the results may look:



The questions used in OLES are cover the categories Computer Usage (CU), Teacher Support (TS), Student Interaction & Collaboration (SIC), Personal Relevance (PR), Authentic Learning (AL), Student

Autonomy (SA), Equity (EQU), Enjoyment (EN), and Asynchronicity (AS). OLES also require a sufficient amount of participating students to give statistically established data.

Usability Inspections methods is the generic name for a set of methods based on having expert evaluators analytically examine usability-related aspects of a user interface (Nielsen & Mack, 1994). These methods can provide a fast and efficient way of evaluating the usability of the eLearning solutions. They are scenario based and can be extended to cover the areas of usability, efficiency, content, accessibility, functionality, distribution and costs. A complete inspection may consist of individual inspections only, individual inspections followed by a meeting, or inspection meeting(s) only (Zhang, Basili, & Shneiderman, 1999). To gain as good coverage and input as possible individual inspections followed by meetings should be used.

Values

ELearning can also substitute expensive classroom training for educating employees. IBM saved US $200 million in 1999, providing five times the learning at one-third the cost of their previous methods (Strother, 2002). This proves that cost reductions are possible when switching to eLearning based education. However, it is also true that some firms that have spent large amounts of money on new e-learning efforts have not received the desired economic advantages (Strother, 2002). Of course the experience and knowledge gained from these efforts can be used when planning their academic initiatives. Further costs can be saved if the material used for in-house training can be reused to gain mindshare through educating students. This gained mindshare is a valuable asset that will result in increased market shares. To measure the mindshare of a technology we can see that the Sun's Java programming language which is very popular today gives 59,123 matches on Amazon book search while Microsoft's C# only gives 12,503. To increase the amount of C# and other .Net developers Microsoft now lets students at IT related educations download their IDE (Integrated Development Environment) Visual Studio and other software for free as part of their academic initiative.

Scenarios

Most scenarios are based on facts that can be measured and reproduced. The exception is costs that can vary depending on contract or agreement signed. The data for this test is taken from interviews with staff responsible at Sun, IBM and Microsoft. These scenarios show an example of how existing eLearning solutions can be compared and evaluated.

Usability and efficiency:

1. The user has signed up for membership, logged in and wants to view a list of available courses. How many clicks are needed to do so?

2. The user is at the start page and wants to search the portal for a specific subject he wants to know

more about. How many clicks are needed to do so?

3. The user has a problem and need to ask an instructor for help. How many clicks are needed to post a message through the available forms of interaction, assuming he is at the start page?
4. The user has a problem with the website. How many clicks are needed to reach the support page for more information assuming he is at the start page?
5. The user has watched all material in a course and wants to take a preliminary test to test his knowledge. How many clicks are needed to open a test, assuming he is at the start page?

Content and its accessibility:

1. Do the courses use slideshows available online/offline?
2. Do the courses use voice recordings available online/offline?
3. Do the courses use videos available online/offline?
4. Do the courses use books that are downloadable?
5. Do the courses use books that have to be bought separately in paper form?

Functionality:

1. Does the portal have live lecture capability?
2. Does the portal have forums?
3. Does the portal have chat?
4. Does the portal have voiceover?
5. Does the portal have viewable statistics of progress?
6. Does the portal have online test exams?

Distribution:

1. In what way are necessary software distributed?

Results

These result matrixes correspond to the scenarios described and gives a quick overview of the abilities of each solutions.

Usability			
	Sun	Microsoft	IBM
1	2*	1	1
2	2	2	2
3	1**	?	2***
4	1	3	1
5	?	2	N/A

*Automatic dropdown menu not included. **Contact info (email) only. ***For email address, there are also forums and messages you can use.

Content			
	Sun	Microsoft	IBM
1	Yes/-	Yes/Yes*	Yes/Yes
2	Yes/-	Yes/Yes*	Yes/?
3	Yes/-	Yes/Yes*	Yes/No
4	No	No	Yes
5	Some	Yes	?

*Through a special program.

Functionality			
	Sun	Microsoft	IBM
1	No*	No**	No
2	No	No**	Yes
3	No*	No**	No
4	No*	No**	No
5	Yes	Yes	Yes

6	?	Yes	No

* Some courses use external software solutions to provide this.
**Not available directly but link to another place where this is provided exist.

Distribution			
	Sun	Microsoft	IBM
1	DL	DL (+ CD?)	DL + CD

DL = Downloadable through website, CD = Provided on cd/dvd

Recommendations

The first and most important step to a successful academic initiative starts with making the technology available to students. Discounts on software are not enough as students today are used to getting software for free, either as open source or illegal copies which is available on the internet. The second step is to evaluate different LMSs (Learning Management Systems). There are several LMS available in the market but few are mature. F. Kareal & J. Klema (2006) evaluates some of the biggest LMSs available. Among the choices are .LRN, Docebo, Moodle, Dokeos, ATutor and Claroline. If none of these fit your needs there are more solutions available on the market. Earlier eLearning solutions often focused on mimicking the classroom training when creating online courses. This makes it easier to understand but does not fully exploit the possibilities that new technology makes possible. Try to use interactivity to improve the communication between students and staff. Implementing forums and chat where students can ask other students and teachers for help and find some of their questions already answered by others is important to maximize the efficiency and reduce the amount of teachers needed per student which in turn gives a higher ROI (Return On Investment). It is also important to provide a very high level of integration. Evaluating the solutions used by Sun, Microsoft and IBM shows that complicated and extensive registration procedures and frequent popup windows still make for an unsatisfying user experience.

Conclusions

One topic that has not been covered in the papers is the registration procedure that is needed to get access to each learning portal. The reason that this has been kept out is that this differs even for the same portal. An example of this is IBM Learning Portal where you need to have an IBM ID which you may or may not have already. To login at Microsoft's portal you need a Microsoft Live account that you may or may not have already. All three portals require access codes that can be gained through faculty members or student ambassadors at schools that have signed up for the academic initiative with the company in question. Overall the registration procedures leave lots of room for improvement as they are too extensive. From a user perspective it can be a very frustrating experience just to get registered. A proposition that would lower the barrier but give the same amount of information would be to split the registration procedures and use a simplified first registration with only email, password, name and access code and a second that could be filled when taking the first test. This would create a

lower barrier for registration and there would be less of a risk that the student would cancel the registration. And the incentive to proceed with registration of details would be higher after the student has taken a complete course and needs to fill in the details to take the final test. Making this simplified registration procedure an option at first registration would provide a good compromise for the user. Another problem that could not be measured properly is the level of integration in each portal. You can get to the same place in more then one way which makes it hard to reproduce the results and also better or worse depending on which one. Microsoft has a very good interactive learning solution but to get there can be very frustrating as the platform is poorly integrated and several problems occurred when doing the evaluation. One is the use of multiple popup windows used, that it did not work with Firefox 3.0, that it sometimes took me to a 404 page that stated that the page I was trying to access did not exist and seconds later when following the same login procedure it did. It should be stated that the login was done through the Swedish Microsoft IT Academy Program site then taking the e-Learning demo that let the user try free courses. I also had to approve user agreements twice excluding the one needed to install the Microsoft Silverlight browser plug-in which is a required to use the portal. Sun's portal is slimmed down and clean. Everything can be reached at a few clicks and only the information you need is shown which reduce clutter. What would be helpful is to add forums where the student can ask questions and contact support. This would also reduce redundant questions as the user would be able to see if someone else has already asked the same question. It would also make the portal feel more active. There are reference links to community sites with different focuses but these can not be considered to be integrated forums for the same portal.

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