

Employing an On-line Learning Environment

Jon Witts

Summary

This report is about the process that I engaged in to produce an on-line learning environment for the school that I work at. The report covers the decision making process involved in choosing an on-line learning environment, from educational, technical and managerial points of view. The on-line course that I decided to develop was an introductory course into using Microsoft Excel. This is a classroom based course, that is frequently run at our school already. The course is mainly aimed at support staff and Teaching Assistants, although some teachers will also take the course.

I developed the course as a trial project, to illustrate to teaching staff at our school the processes involved in turning a classroom based lesson into an on-line course. If the course is evaluated to be successful, I will convert the rest of the training courses resources into an on-line format, and allow staff to take the training course as an on-line course.

Due to the fact that this course was developed as a trial project, and has not had any members of staff at our school take the course; the evaluation has been carried out by a group of expert users. These expert users were asked to conduct a Heuristic evaluation and also use a discussion board to comment on their experiences. Using this information, I have been able to draw sound conclusions about the courses effectiveness and also highlight the areas that need improving upon.

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Introduction

This report is an evaluation of the process that I have undertaken in developing an On-line Learning environment for the school that I work at. My role as Director of ICT means that the school's leadership looks directly to mean for up-to-date information and feedback regarding the development of ICT within the school. With the publication of the DfES's E-Learning Strategy, all secondary schools are required to have an Personalised Learning Space in place by 2007 / 2008 (DfES 2005). The school's management had decided that a Virtual Learning Environment was the best way to achieve this requirement by the DfES, whilst further supporting department's integration of ICT within their curriculum. I was asked by the school's management to look into the best possible solution for the school's VLE.

The topic of the on-line learning environment that I have developed for this unit is an introductory course into Microsoft Excel. I had previously been asked by the school to run this course of training for Teaching Assistants and Support Staff at the school. I have always run this course in a classroom based format, but decided that on this occasion it would benefit the school and staff if I was to develop the course into an on-line format. This would enable staff to review the course whenever they needed, and also access it in their own time, rather than having to take time out of their working day.

Under my recommendation, the school has decided to use the Moodle VLE platform. There were many reasons behind my recommendation for this platform, which I will cover in more detail in the development section of this report.

The development of this course started with my investigation into On-line Learning platforms. I looked at many different platforms, considering their technical capabilities, but also their pedagogical stance. Once the platform had been decided upon, I then took my materials I had developed for the classroom-based course and looked at how I could use them in an on-line environment. I read several educational journals about evaluating on-line learning courses and how best to develop materials for all learning styles. The most useful source for evaluating learning platforms was <http://www.opensourcecms.com/> . This site has a wide variety of open source content management systems installed, that you can trial and look at before you download and install. The journal entitled "VARK Preferred Learning Styles and On-line Education" by William A. Drago and Richard J. Wagner was very useful in helping me consider how best to present the material on my course, and the journal entitled "Teaching the teachers: teaching and learning online" by Barbara A. Burd and Lori E. Buchanan, was very helpful for me in thinking about how best to transfer classroom based materials into an on-line learning format.

The learning outcomes for my course were:

- Move around workbooks and worksheets
- Insert and delete rows and columns
- Calculate with the Auto Sum function
- Calculate using +, -, * and /
- Copy formula
- Create charts using the chart wizard

Development

When looking at which platform the school should employ, there were various issues to consider. My role at the school, meant that I had to consider the situation from a technical perspective as well as an educational one. I looked at the two main runners of commercial On-line Learning environments at the time, Blackboard and WebCT, and also looked at various open source solutions.

The school had already been using a static HTML Intranet system to share resources within courses and between staff. Whatever solution that was put in place would need to be able to be used as a document repository as well as an on-line learning environment, as the school would need to maintain this document sharing.

Most on-line learning environment solutions have a similar pedagogical grounding, that lends itself to the idea of student centred learning. As Burd and Buchanan (2004) state in their journal, on-line learning promotes the student to take responsibility of the process of gaining knowledge, and the teacher becomes a facilitator, delivering the opportunities to gain that knowledge to the student. This is a shift in pedagogy from the traditional classroom based pedagogies that most teachers at my school are used to working with. From this, it followed that which ever on-line learning environment the school decided upon, it would require a period of training and development for the staff, before it would be successfully utilised.

When looking at the various different platforms available, I also took into consideration the factors of support, set-up cost and hardware requirements of each system. The commercial systems were obviously more expensive than the open source solutions, but the factors of support had to be weighed up in conjunction with the cost factor. With all of these factors in mind, I settled on Moodle as my choice of on-line learning environment. The support from the Moodle website is very good, it has a large and growing user base and it is open source. This means that the school only need pay for the hardware costs to set up the system in the school and not have to budget for a yearly license cost. The pedagogical background to Moodle is Social Constructivism. This is an extension of the Constructivism pedagogy, to include the idea of social groups creating knowledge for one another, by sharing information and carrying out exercises together. This pedagogy, although very different from a standard classroom based pedagogy, does fit with the school's development of action research projects and Assessment for Learning schemes.

Having decided upon the choice of on-line learning environment, the next stage in my development was to populate it with some resources. The resources that were already on the school's static intranet system were transferred into the school's install of Moodle by myself and one of my technicians, and the teaching staff were then given control of their own subject areas. However, for this unit, I needed to develop a course of my own, so I decided to transfer my classroom based Microsoft Excel course into an on-line format. I felt that this would be helpful not only for the school and members of staff who would take the course, but also for myself, as it would give me direct experience of taking a classroom based lesson and converting it into an on-line format; a process that many staff I would have to train in the use of Moodle would also be doing. This would give me examples and insight into the problems and solutions that our staff may encounter.

I started with the handout and the learning outcomes that I had previously developed for my Introduction to Excel Course as a starting point for my on-line learning environment course. The course had been developed as a three session course, so I

decided that for this project I would focus on the first session. The main problem that I encountered was how to turn a four page handout into an effective on-line learning environment, that would be engaging to trainees. My original handout started with a breakdown of the learning outcomes for the trainees. I felt that this was as important in an on-line environment as it was in a classroom setting, therefore the first resource I set-up in my course was a list of the sessions learning outcomes.

Objectives – Session 1

By the end of this session you will be able to :-

- Move around workbooks and worksheets
- Insert and delete rows and columns
- Calculate with the Auto Sum function
- Calculate using +, -, * and /
- Copy formula
- Create charts using the chart wizard

[Now click here to go to the first exercise.](#)

Burd and Buchanan (2004) state that the syllabus is central to the development of on-line courses, and should include the objectives of each module, spelling out to the students what they are expected to learn from the course. They also talk about the format that heavily textual information should take, stating that it is best if this sort of information is broken up by lots of white space, using headings and sub-headings to break up the information further. They also go on to say that students will react best to a logical and sequential flow of information, which has links to definitions and terminology that they are unsure of.

With this in mind I began to develop the rest of my course. I broke the information down into short exercises, breaking the information up with screen shots of what I was asking the trainees to do. At the end of each exercise, I gave the students the possibility to upload the completed exercise, and the move onto the next section. This gave me, the trainer, the possibility to review the development of each trainee throughout the course and see if my objectives were being met, and provide necessary feedback to each trainee. I also set up a glossary which would auto-link terminology used throughout the course to its definitions. However, rather than me completing this glossary, I added it as an exercise for students to undertake. I hoped that this would further enable me to evaluate how effectively the students were learning the course materials.

Evaluation

The evaluation technique that I decided to use was a Heuristic evaluation and an end User evaluation. I decided to collect both of these evaluations through the course itself. My course was not a live course, as I have not yet had to run the Excel training course this term. In order to be able to evaluate the effectiveness of my course, I decided to use expert users, my peers on the degree course, to test and evaluate the material for me. As my peers from University do not work at my school, I could not give them access to the school's live VLE, as there is a lot of material on the VLE that is copyrighted, and only allowed to be made available to students and staff at our institution. Also, there is some sensitive information available through the VLE that the Data Protection Act states needs to be kept private. For these reasons, I set up my course on a stand alone install of Moodle on our school servers, that I could give the general public access to without compromising copyright or Data Protection Issues. With the course set up in this environment, I could give access to the group of expert users. I asked them all to complete the course, and use the discussion board to provide End User feedback, and complete the Heuristic evaluation to give me an idea of the usability of the course.

The End User evaluation would give me an insight into the issues trainees may have with the system, and the Heuristic would let me know if there were any technicalities that I needed to address in the course. I incorporated both evaluations into the course so that all of my expert users would hopefully take the evaluation, giving me the best possible range of results.

In the End User evaluation, Kathryn pointed out that she had been unable to follow one of the links in the course. Another point raised here was that the issue of moving from one application to another was sometimes tricky. Generally, all of the End User feedback was positive and from this it seems that the course was a successful design, with only a few issues to be considered for further development. Carole made the point that she felt the course was very easy to follow and had clear instructions, whilst Cheryl expanded upon this point, saying that she felt it was quite behaviourist, in that it broke the material down into small chunks of information. Cheryl also raised a point that she found it hard to "toggle" between the browser screen and the Microsoft Excel application, and offered a suggestion as to how this might be overcome.

The Heuristic evaluation gave a more detailed and focussed framework for the expert users to give their feedback on. The feedback gained through this evaluation highlighted more issues with the course that I could address. It also confirmed which areas of the course were sufficiently well designed.

Four expert users completed the Heuristic evaluation, with this analysis being much more focused than an end user evaluation, it has highlighted more issues and problems with the course. By the same merit it has also flagged up more areas of the course that worked well. There are some issues that are raised as violating the heuristic as well as supporting it, for example, one user states that toggling between the two windows violates the heuristic for the user not having to remember information from one part of the system to another. However a different expert user, felt that the software opening in another window made it easier to move between instruction and software.

The feedback from the heuristic evaluation is in the table below, after which I evaluate more of what this feedback meant to my course and its design.

Heuristic	Supports Heuristic	Violates Heuristic
Visibility of system status	Level of feedback is adequate. Clear and precise instructions. Linking terminology section. Links from activity to activity. Very clear.	Cumulative indicator would help. Introduction and starting point to the course.
Match between system and real world	No technical jargon in the course. Clear familiar language. Lucid explanations. Glossary helped with technical terms.	Toolbars missing. Not always in the users language.
User control and freedom	Undo and Redo worked. Clear error messages. No problems encountered. Breadcrumb navigation.	Lack of standard formatting bars in Excel.
Consistency and standards	Examples were good. Course and information clear. Instructions were clear. Breadcrumb navigation. Terminology consistent. Glossary helped.	Confusing when creating charts.
Error prevention	No errors encountered. Design was good. Navigation good. File upload worked well. No errors encountered.	Some links did not work correctly. Toolbars not appearing correctly. Had to type answer for Q10 in Q9 box.
Recognition rather than recall	Started well. Links opened in a new window, making it easy to move between software and instructions. Breadcrumb trail and hyperlinks. Clear information to show user where they are in the system.	More examples for charts section needed. Toggling between two windows.
Flexibility and efficiency of use	User could skip through the course. Easy to navigate. Seems to be catered for.	A little too advanced for novice user.
Aesthetic and minimalist design	Dialogue was good. Information useful and easy to follow. Information and design was clean and concise. No extraneous information provided.	Did not specify that user should post to discussion board.
Help users recognise, diagnose and recover from errors	No error messages encountered. Solutions were suggested with ease. No error messages received. No errors encountered.	
Help and documentation	No search carried out for help files. Did not need any support information. Clear information.	More help documentation would help the novice user. Could not find help feature.

The one violation that crops again and again is the issue of the toolbars not appearing correctly in Excel when the links are opened. I have looked into this issue and found out why it was happening. Most Microsoft computers are set to open Microsoft Office documents that are linked from a web page, in a web browser rather than launching the actual programme. There are various security reasons why this is the default

behaviour for Microsoft operating systems, but it is possible to change it. The method for changing this behaviour on a client PC is rather complicated, and outside of a school network environment, where you can not fully control the set-up of the PC's, it is probably infeasible to ask students to make the change to their own PC's themselves.

Upon further research into this problem, it turns out that there is no way that you can control this behaviour from the web server with the course on it. The only way to ensure that the files would be opened in the full application rather than a web browser is to either make the changes on each client machine, or to instruct all students to save all files to their computer first and then open them.

Either of these solutions would require a reworking of the documentation. My preference is to add a section at the start of the course that guides the user through the process of making the changes to their PC so that their settings are then correct for the rest of the course. In this description I could state that if they did not want to, or could not follow the instructions, they would have to save each file first and then open it with Excel.

Another point that was raised a couple of times was the lack of contextual help or support information. The Learning Environment has its own help for teachers who are creating courses and content, but this does not extend to the user of the system. It would be possible to create help files for the use of the course, or even set up another discussion forum that was purely for posting support requests and responses. The strength of a discussion forum over simple help files would be that a live list of "Frequently asked Questions" would evolve, meaning that users could search the questions that had already been answered before posting a question of their own.

Conclusion

The choice of platform for the Learning Environment was one that was made a long time before this unit began, and to that end the decision of which platform I would use was already made. However I feel that the process that I went through in choosing Moodle as our platform, is a valid process and belongs in this report. The introduction of this system has enabled our school to develop a successful On-line Learning Environment, long before the DfES have required all schools to have it in place. The nature of Open Source software has also allowed us to tweak and modify the software until it exactly fits the need of our school, something that could not be done easily with commercial software. The pedagogy behind the system, has enabled staff to experiment and develop how they use ICT to enrich their students learning, and has been embraced by a large number of the staff at our school.

The process that I went through in developing this course myself has greatly helped me to understand the requirements of converting a classroom-based lesson into an on-line experience, something that will prove extremely useful time and time again as I train our teachers how best to use the system for their lessons. The course I developed has proved to be an easy to follow course with very few technical issues. The issues that did arise are easily solvable, and again have highlighted potential pitfalls to me, that I can advise teachers to steer clear of, or discuss the potential solutions with.

I have learnt a lot in terms of how best to format information for on-line learning and how to evaluate and troubleshoot projects. The research I did in preparation for this report has also proved very useful, particularly the journals that I read around the process of designing and evaluating On-Line Learning Environments.

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