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WELCOME TO SOJEL

Foreword by the Editor, Dr John Biggam

SOJEL is an online e-Learning peer-reviewed journal, reflecting e-Learning theory and practice in Scotland, Europe and further afield. The response to SOJEL from the e-Learning community – in academia and elsewhere – has been excellent. Long may this enthusiasm continue! The papers published in this very first issue of SOJEL are rich in variety of topic, from Peter Hinch's informative paper on delivering mathematics through an e-Learning platform to plumbing apprentices, to Professor Martyn Sloman's personal reflections on the development of e-Learning in the corporate world.

Scotland has a proud tradition of looking outwards to learn from others. This journal tries to live up to that tenet, evidenced in the number of papers accepted from outwith these borders: from Spain, Italy, Eire, Luxembourg and Belgium. Such diversity of cultures and experiences can only enhance the goal of SOJEL, which is to learn from each other and to develop best practice in e-Learning.

SOJEL is a free journal, published twice a year, in June and December. This journal is only made possible because of you, the learning community. The contributions are warmly received, greatly appreciated and of a high standard. Thank you.

John Biggam

CONTENTS

Page

CAN BLENDING FACE-TO-FACE TEACHING WITH E-LEARNING SUPPORT THE DEVELOPMENT OF APPRENTICES IN MATHEMATICS?

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Abstract

This paper outlines the results of a formative evaluation research study to establish if blending face-to-face and e-learning delivery methods can support the development of apprentices in mathematics. The study included the design, development and evaluation of a mathematics web site which is grounded in established theoretical criteria for effective blended delivery within third level education. This web site is delivered through the WebCT e-learning platform .The research design used a mixed method approach combining both quantitative and qualitative data derived from questionnaires, interviews, non-participant observation and focus group sessions. The research, which lasted three months, involved forty plumbing apprentices. The principal findings of the research indicate that student apprentices who took part in the blended learning module showed an improvement in examination results in questions with a mathematical content. Feedback from students who took part in the study shows that their experience of e-learning was extremely positive and that 84% would like to participate in this type of delivery method in the future.
Keywords: e-learning, apprentices, mathematics.

1. Introduction

The Irish apprenticeship system consists of seven phases alternating between on-the-job and off-the-job stages (Department of Education and Science, 2006). The on-the-job phases are numbers 1, 3, 5 and 7 while the off-the-job phases are numbers 2, 4, and 6. In the majority of crafts the duration of Phase 2 is 20 weeks while phases 4 and 6 are 10 weeks each. During Phase 2 student apprentices attend training centres run by FÁS, the state agency for training and employment. Phases 4 and 6 are delivered by the third level sector such as the Dublin Institute of Technology (DIT). The current duration of an apprenticeship is four years, providing that all the phases are successfully completed within the required period. Any repeat examinations result in a longer time scale for the apprenticeship.

There are twenty-six designated trades in the Republic of Ireland with 28,252 registered apprentices as of April 2005 (FÁS, 2005). As can be seen from Figure 1 below, the five trades of electrician, carpenter, plumber, bricklayer and mechanic represent 76% of all registered apprentices in the Republic of Ireland.
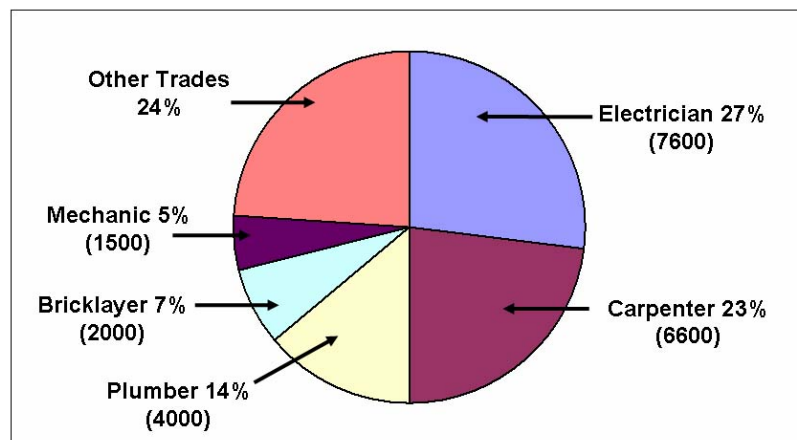
Figure 1: Registered apprentices in the larger trade disciplines in the Republic of Ireland.

To be registered as an apprentice in Ireland, candidates *'must be at least 16 years old and have at least a grade D in any 5 subjects in the Junior Certificate'* (FÁS, 2006). Second level students in the Republic of Ireland have the option of taking two state examinations – the Junior Certificate and the Leaving Certificate. Second level students sit the Junior Certificate examination after three years and the Leaving Certificate after a further two years. Given the stated requirements, it can be seen that to be registered as an apprentice in Ireland there is no particular requirement regarding a minimum standard in any core subject such as mathematics or science.

Although 53% of all apprentices have a Leaving Certificate qualification the remainder would hold a Junior Certificate as their highest second level qualification (DIT, 2004). These percentages are representative of the total apprenticeship population and there is no breakdown of the number of apprentices in the different craft disciplines who hold either a Junior Certificate or Leaving Certificate. Interviews and questionnaires with 250 apprentice plumbing students who attend the School of Construction at the DIT have revealed that 60% hold a Leaving Certificate and 40% a Junior Certificate only.

2. Context of the Research

It is important to outline how apprenticeship has developed in an international context and how it has been adapted and changed in the Republic of Ireland to reflect improved practice in the education system. Heraty et al. (2000) outline how apprenticeships have developed from the Guild systems of the eleventh century. Ní Cheallaigh (1999) believes that apprenticeship *'is the original model of internationalisation'* (p.1). This argument is based on the fact that qualified craftspersons can travel throughout the world and have their skills and qualifications recognised. It is often the case that language may not be a barrier when practical hands-on skills are required to successfully carry out an operation. For example, for many years, architects and designers have used symbols and characters to identify the various services within a building. These symbols are agreed internationally and understood by craftspersons without the need to interpret language.

The European Training Foundation (ETF) is the European Union's centre of expertise supporting vocational education and reform in third countries. Its research has

shown that Central and Eastern European countries are still in the process of identifying answers to the problems and challenges associated with vocational education and training. As a result of independence, between 40 and 60% of the total budget available for training is no longer available (European Training Foundation, 2004). The reasons for this are somewhat disturbing and are identified by ETF as lack of political consensus and, at civil service level, a lack of experience combined with an unwillingness to initiate reform. However, in the European countries not affected by relatively recent political upheavals, apprenticeship systems are changing, growing and expanding. The main catalyst driving these changes has been the development of the 'dual system' which originated in Germany. Within the dual system apprentices experience work-based training with employers and also attend training and/or educational modules in off-the-job locations. In recent years this method has been adopted by many countries including Austria, Denmark and Ireland (Ryan, 2000).

The earliest form of apprentice regulation in Ireland dates back to 1898 with the enactment of the Agricultural and Technical Instruction (Ireland) Act. Following Apprenticeship Acts in 1931 and 1959 the next major reorganisation occurred with the introduction of the standards-based system in 1992 (Heraty et al. 2000). Following a slow start, recruitment into the new system grew rapidly as indicated in Figure 2 and by December 2004 the number of registered apprentices in the Republic of Ireland had risen to almost 28,000 (FÁS, 2004).
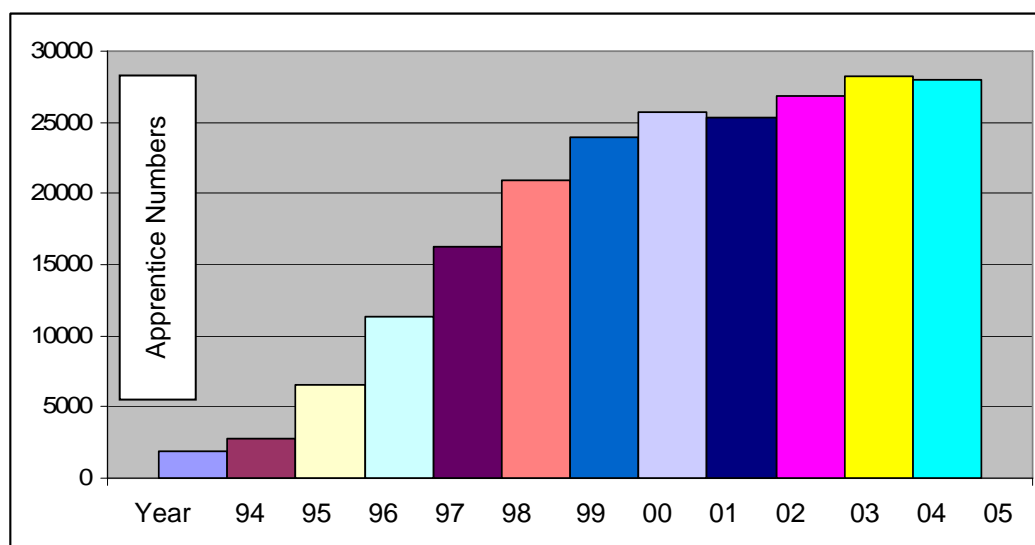
Figure 2: Registered apprentices from 1994 to 2005. [2]

The success of the Irish system is self-evident from these figures, but what makes it unusual is that it arose from social dialogue between trade unions and employers rather than government initiatives (Field and O'Dubhchair, 2001).

Where exactly apprenticeship falls within the educational, vocational and training fields is a matter of considerable debate (Ryan, 2000). Apprentices in Ireland are governed by the statutory Rules of Apprenticeship and are guaranteed a minimum of forty weeks training and education in off-the-job locations (Department of Education and Science, 2006). This is divided into three blocks, the first of which is of twenty weeks duration followed by two of ten weeks each. This means that the apprentices

who attend the third level institutions are usually mature adults in their early twenties who are in the later stages of their chosen profession. Apart from the traditional skills and knowledge required within each trade or craft, the educational system has a responsibility to help students develop key skills that are essential to knowledge-based economies, such as entrepreneurial and risk-taking attitudes as well as moral and civic qualities (OECD, 2005). This shift in emphasis towards a knowledge-based economy, where lifelong learning and knowledge transfer are now seen as paramount, places Institutes of Technology at the forefront of this challenge. When apprentices qualify as craftpersons, it will be essential to offer them opportunities in further education, which will naturally benefit the economy.

The Irish National Framework of Qualifications, introduced in 2003, established a single, easily understood award system for use in both the training and educational fields. Within this framework qualified craftpersons attain a level 6 standard at which time they are awarded the National Craft Certificate (NFQ, 2006). This puts them one level below the Ordinary Bachelor Degree standard. The framework relates all education and training awards to each other and is described as learner-centred. It is shown in fig. 3 below.
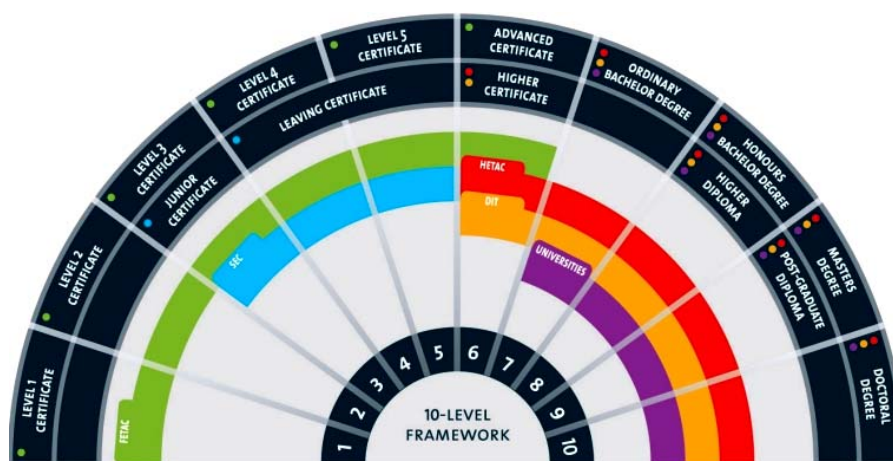
Figure 3: The National Framework of Qualifications.

3. Rationale for the Study

When the apprenticeship system was reorganised in 1992 the educational standard for registration was raised from three passes in the Junior Certificate to five. However, there is no stipulation regarding the necessity to achieve a minimum standard in any core subject. In reality this means that many apprentices would not have achieved a pass standard in subjects such as mathematics. Nevertheless, such people can, and do, gain entry to the apprenticeship system and as a result struggle to come to terms with the mathematical standards pertaining within a craft. Weaknesses such as this have been identified as *'quality assurance'* issues by Field and O'Dubhchair (2001, p.254). As previously mentioned 53% of apprentices have a Leaving Certificate qualification. Bearing in mind that this is the highest standard of second level education in the Republic of Ireland, it follows that the majority of this cohort could potentially be entitled to a place within any of the third level institutions. A problem remains regarding the 47% of apprentices who do not have this level of education, many of whom have difficulties with, for example, mathematics.

Informal discussions with FÁS instructors from several training centres and college lecturers from various Institutes of Technology confirm the difficulty that a significant number of apprentices have with mathematics across a wide range of crafts. Many apprentices openly admit that they find it extremely difficult to come to terms with this element of their education and often ignore mathematical questions in examinations. This can mean that in order to pass a test they have to strive to achieve correct answers in all other questions should they fail or ignore just one with mathematical content. This leads to another problem unique to apprenticeship, which is progression.

Within the standards-based system, if an apprentice fails to reach the necessary standard, he or she must retake the examination. This situation is compounded further by the fact that apprentices in phases 4 and 6 are only allowed one attempt per phase at each test. Some crafts have as many as ten examinations which cover both theoretical and practical aspects of a course. Apprentices who fail examinations in June will not have the opportunity to retake them until December, during which time they return to their employers and their apprenticeship is effectively frozen until they pass the tests. Unfortunately there are very few revision classes offered by the Institutes of Technology to help apprentices who fall into these situations.

The main thrust of the rationale behind this study is the perceived shortcomings in current mathematical education for apprentices. A review of relevant literature and my own experience as an online student on the Postgraduate Programmes in Third Level Learning and Teaching has led me to believe that a blended delivery of face-to-face learning combined with relevant online course material would make a genuine contribution to solving the difficulties that apprentices currently experience relating to craft mathematics calculations. There are many definitions of blended learning in the literature. Wilson and Smilanich (2005) state that *'blended learning generally means the application of two or more methods or solutions to a learning need'* (p. 12).

Thorne (2003) offers a broader definition describing blended learning as *'an opportunity to integrate the innovative and technological advances offered by online learning with the interaction and participation offered in the best of traditional learning'* (p. 3).   Within the context of this research study the definition of blended learning most applicable would be similar to that offered by Rossett et al. (2003) who believe that *'options for blended learning go beyond the classroom. They're formal and informal, technology and people-based, independent and convivial, and directive and discovery-oriented'* (p.1). Apprenticeship education is best suited to social constructivism where collaboration and interaction are fundamental to the learning process. Therefore a blended learning strategy should be broad enough to offer students as many opportunities to learn as possible.

By developing a web-based learning module to complement the existing classroom mathematics, apprentices who experience difficulties in this area can be better catered for. Such an e-learning mathematical programme specifically designed to meet the needs of, for example, plumbing apprentices, would not only complement classroom activities but also allow students to work at their own pace and, if necessary, remote from the face-to-face learning environment. Online activities can offer the opportunity for students to work on their own or collaboratively. Barkley et al (2005, p.25) believe that collaborative learning *'puts into practice the major conclusions from modern cognitive learning theory'* such as acquiring, remembering

and using knowledge. This means that students can take control of their own learning, but while this process is taking place they have a support structure available to them within a college environment.

A blended learning approach of traditional classroom lectures combined with online activities can offer a number of benefits such as allowing students to work at their own pace and at a time that suits them. In discussing blended learning Thorne (2003) states that *'the whole philosophy of self-managed learning provides individuals with choices about how and where they learn'* (p. 71). However, there may be some drawbacks associated with the online component, such as assuming that the students will access the content and apply the knowledge, or overestimating what online learning can accomplish. To help overcome problems such as these the designer / tutor must ensure that the content is relevant, well presented and that the student understands how to access the material. Wilson and Smilanich (2005) recommend that both a needs assessment and a needs analysis be carried out to determine the validity of a programme or course. Finally, there must be a support structure in place to answer student queries and also offer help and feedback. Therefore considerable thought must be given to the design of online materials to ensure that the needs of students are catered for.

Such a resource would benefit those in attendance at the college and also those apprentices who have returned to their employer and are waiting to repeat examinations. By utilising an online resource, student support is available in two forms: firstly, in formative feedback built into the web site, and secondly through discussion boards between students themselves and a course tutor via email. Laurillard (1993) believes that if students are to achieve a high level of competence they should not be expected to supply additional supports for themselves, and furthermore states that the whole point of new technology is to improve the quality of teaching and learning.

To strengthen the basis for the rationale of this study, the examination results of ninety-six Phase 4 apprentice plumbers have been analysed. The results are shown in Table 1 below.

Apprentices with Leaving Certificate maths	60%
Apprentices with Junior Certificate maths	40%
Apprentices with Leaving Certificate who have difficulty with maths questions	10%
Apprentices with Junior Certificate who have difficulty with maths questions	39%
Number of maths questions analysed	288

Table 1: Analysis of examination results for Phase 4 plumbing apprentices

As part of the needs analysis for this study a survey was conducted amongst a group of eighty apprentices in the Dublin Institute of Technology between April and June 2005. The results indicated that over 80% would be interested in participating in e-learning. With such a high number expressing interest, and bearing in mind that up to 39% of student apprentices need to repeat theory examinations (DIT, 2006) One

could argue that there is an onus on the teaching staff to respond to their needs. The survey also showed that 74% of students had access to the Internet at home. In interviews and questionnaires conducted between April 2005 and March 2006 with two hundred and fifty apprentice plumbers in the DIT School of Construction, the majority (80%) indicated that some form of additional support would be appreciated and is indeed required, not only in relation to mathematics but in many other areas also.

4. The Mixed Method Approach

Much modern research includes both quantitative and qualitative methods (Creswell, 2003; Wisker, 2001) and this study incorporated both types. There are sound reasons for incorporating both quantitative and qualitative methods in a research design such as the opportunity to use triangulation which can be used to compare the results of both methods (Patton, 1990). A mixed method approach will also offer a more complete picture of events particularly where people are involved. If only one method is employed (which is sometimes referred to as a fixed design) it may only focus on the researcher's perspective whereas flexible designs such as the mixed method approach tend to focus more on the participants (Robson, 2002). It is also the case that although quantitative methods can identify weaknesses in a study it may be difficult to explain why they occur and offer solutions. Qualitative methods on the other hand will often help to explain particular phenomenon and may offer solutions to problems. Finally, qualitative methods usually focus on the micro-level while quantitative analysis is ideally suited to large scale research (Patton, 1990).

Figure 4 below shows how the quantitative and qualitative methods were used in this study and how triangulation was employed to add validity and credibility to any findings.

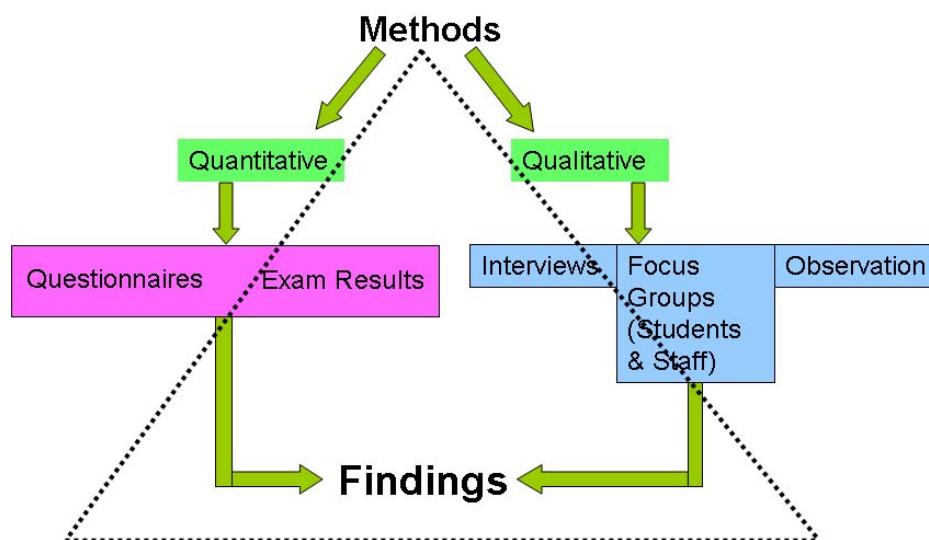**Figure 4: Diagrammatic representation of the mixed method approach utilised in this research study.**

Within this study the quantitative methods of data collection comprised two substantial pieces of work. The first involved the analysis of examination scripts of Phase 4 apprentice plumbing students, with particular reference to mathematical questions. In total 160 scripts were analysed which contained 288 mathematical

questions. By comparing the examination results of those who took part in the study with those of apprentices of a similar educational level who did not, it was possible to explore the effects of the blended approach to facilitating learning in mathematics.

The second piece of quantitative analysis related to two different questionnaires. The first questionnaire was completed by 106 Phase 6 apprentices. This group fulfilled an important function in the research because they had all completed the Phase 4 programme in five different third level institutions. This enabled the gathering of information on a national level, which arguably added a degree of validity to the findings. This questionnaire was completed early in the research study. The second questionnaire was completed by the forty Phase 4 apprentices who participated in the research and was carried out at the end of the study. It can be seen from these figures that a quantitative data collection method was best suited for the collection of this information. George and Cowan (1999) recommend caution when using questionnaires as a method of data collection particularly where the respondents are remote from the research site as this can lead to a low return rate. Where low returns are the case the results can often be distorted. With this in mind, all questionnaires would be filled out within the college environment.

The qualitative data collected was from interviews, observation and focus group sessions. Semi-structured interviews were used as recommended by Wisker (2001), whereby a small number of set questions were asked while still offering the opportunity for some divergence. These interviews took place before the students had participated in the blended learning strategy. The apprentices who took part in the study were allocated one hour per week in the computer laboratory. In total, there were five 1 hour sessions. This offered the opportunity to observe the students while they were in the computer laboratory. Silverman (1993) believes *'observational studies have been fundamental to much qualitative research'* (p. 9). Denzin (2001) also advocates the use of observation and believes that researchers should learn to listen and look particularly where interpretivism forms part of the research process.

It can be argued that the quantitative and qualitative methods used in this study are distinct entities, yet also manage to complement each other. While the quantitative data is cold and distant it is necessary if recommendations are to prove worthwhile, hence the need for such large numbers of questionnaires and the analysis of a significant number of examination scripts. This is acknowledged by Patton (1990) who believes that in the case of quantitative research generalisation is possible when the reactions of many are found from a limited set of questions. Silverman (2005) concurs with this view where a mixed method approach is utilised in the research study.

The qualitative aspect of this research dealt with the learning abilities of apprentices both in a classroom setting and as participants in an e-learning programme. The qualitative approach enables the researcher to get close to the participants and view the situation from their perspective. This study also allowed the investigation of circumstances where at present little is known and where further research may come later (Gillham, 2000).

5. Comparative Analysis of Examination Results
One of the major influences on student learning is the need to perform well in assessments and examinations (Ramsden, 1992; Gibbs and Simpson, 2002, Rust et

al, 2005). For this reason one of the ultimate tests in this evaluation study involved comparing the examination results of those who took part in the research with those of apprentices from previous intakes who had not had this opportunity. The sampling strategy is as important as the methodology or instruments used to collect data and may ultimately determine whether the findings stand or fall (Cohen et al, 2000).

In the analysis of examination results of previous groups of apprentices, it was found that 39% of those who held only a Junior Certificate qualification failed at least one mathematical question per theory test. This finding was based on an analysis of 288 mathematical questions from 160 scripts, where 60% had a Leaving Certificate and 40% had a Junior Certificate only. These findings are presented in Table 1. The post-research analysis of those who took part in the study examined 120 scripts containing 240 mathematical questions. The group involved in the study was made up of students 50% of whom had a Leaving Certificate and 50% of whom had a Junior Certificate only. The number of Junior Certificate students who failed at least one mathematical question fell to 29%.

These findings are presented in Fig. 5 below. It can be seen that the number of student apprentices who held only a Junior Certificate was 50% which is 10% higher than the pre-research figure. It could be argued therefore, that the percentage improvement is statistically higher given that the number of students with a Junior Certificate who took part in the research represented 50% of the total group while in the pre-research analysis a figure of 40% was used as a benchmark for comparison. In actual fact, the percentage who got at least one mathematical question wrong was lower than might have been expected.
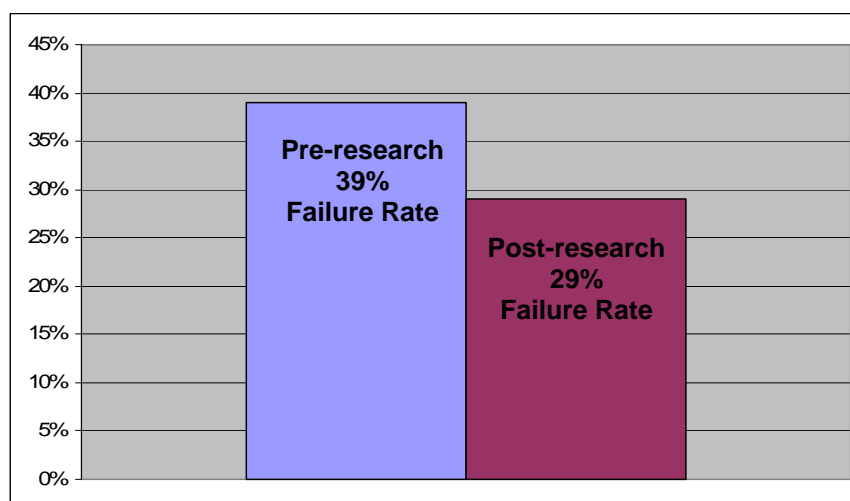
Figure 5: Percentage of apprentices with a Junior Certificate who failed at least one mathematics   question.

An improvement of 10% in the examination results for Phase 4 apprentices in mathematics could best be described as significant rather than dramatic. However, the results of the Phase 4 questionnaire and the Phase 4 student focus group session indicate that the students benefited from the e-learning experience and would recommend it to future apprentices.

6. Conclusions and Recommendations

The aim of this study was to determine if blending face-to-face teaching with e-learning could improve the examination results of Phase 4 student apprentices in mathematics. This study has found that where e-learning and face-to-face teaching are incorporated into a craft mathematics apprenticeship programme, the examination grades of students improve.

The literature shows that a social constructivist framework is ideally suited to apprentice education (Bockarie, 2002). It also informs us that blended learning is an effective combination of different modes of delivery, models of teaching and styles of learning (Procter, 2003).

The qualitative findings have proven to be very positive from both a student and a staff perspective. The students in the study found the experience enjoyable and worthwhile which is clearly evident from focus group sessions and also from the questionnaire results. I believe this is vitally important because if students 'buy into' a learning strategy they are more likely to benefit from the experience. It may also encourage them to continue and expand their knowledge, not only within their chosen profession, but in the wider context of lifelong learning. This can lead to an improvement in attitude which was identified in the staff focus group session as an important ingredient within the learning process.

The main conclusions emanating from this study are as follows:
The Need for Additional Student Support: The findings from this study show that additional support should be provided for student apprentices by third level institutions, particularly in the area of craft mathematics. Apprentices whose highest second level qualification is the Junior Certificate are three times more likely to experience difficulty with mathematics than apprentices with the Leaving Certificate.

Student Induction and Course Design: With careful student induction and course design, a blended teaching strategy of face-to-face and e-learning can lead to an improvement in the examination results of apprentices with regard to mathematics.

Blended Learning Strategy: When offered the opportunity to participate in a blended learning environment, student apprentices whose highest second level qualification is the Junior Certificate showed a 10% improvement in mathematical questions when compared to students of a similar educational standard from previous intakes who did not take part in the study. O'Donnell and Garavan (2003) believe that *'there is positive recognition for the benefits of blended learning'* and outline how it is compatible with learning orientations such as constructivism (p. 11). This study has shown how a blended learning and teaching strategy has benefited Phase 4 student apprentices who have previously experienced difficulty with mathematics. To apply this blended approach to apprenticeship education it will be necessary to develop further e-learning modules which will benefit these students.

The recommendations that emerge from this formative evaluation research study are as follows:
- This blended learning method of teaching mathematics to Phase 4 plumbing apprentices should continue to be used within the DIT and the examination results of students monitored to establish if the improvements evident in this study can be replicated over an agreed timeframe of at least three semesters;

- That teaching staff involved in the education of apprentices should be encouraged to seek development in the area of WebCT course design. This could enable further modules to be developed using blended learning and teaching strategies. In particular, revision packages for students should be developed using WebCT as a teaching and learning platform. To encourage and assist academic staff in the use of WebCT as an aid in apprentice education, a group of those interested in developing online resources could be established with a view to sharing resources and ideas;

- The mathematics web site should be demonstrated to other Institutes of Technology which deliver the Phase 4 plumbing programme and if necessary made available to them. This web site should also be made available to Phase 4 plumbing apprentices who are remote from third level campuses and are awaiting the opportunity to sit repeat examinations;

- Additional self-tests should be included on the web site. This would enable students to reinforce their learning and identify weaknesses that they need to address. This in turn would help students take responsibility for their learning;

- An online grading system, integrated with self-tests, could offer student apprentices a mark allowing them to monitor their progress. This strategy may help to motivate students, an issue which was identified as a problem area by the staff in the focus group session.

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SUSTAINABLE eLEARNING:
THE CALEDONIAN ACADEMY CONTRIBUTION

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Abstract
This paper provides an overview of the philosophy and approach underlying the newly founded Caledonian Academy at Glasgow Caledonian University, which aims to tie research on learning into development of learning and teaching practice at Glasgow Caledonian in a close synergy. Two recent research projects illustrate the approach we are taking: the Models of Practice (Mod4L) project has looked at representational issues surrounding the sharing and reuse of learning designs, while the Community Dimensions of Learning Object Repositories (CDLOR) has looked at the socio-cultural, organisational and pedagogic contexts and needs of the potential user communities of repositories. Both these projects have been based on the philosophy that, if sustainable e-learning is to be embedded in practice, then practicing teachers need to be involved at every stage of development.
Keywords: Caledonian Academy, Glasgow Caledonian University, sustainable e-learning, repositories learning design.

1. Introduction
E-learning has risen to prominence in the context of three challenges facing teachers in further and higher education: the increasing size and diversity of the student body; an increasingly managerial approach that evaluates education against cost, efficiency and measurable outcomes; and the potential of new technologies to provide personalised learning and call into question traditional ideas of the purposes of education and what constitutes knowledge. Furthermore, recent pedagogical theory is promoting a more active approach to learning and teaching (Beetham & Sharpe, forthcoming 2007).

The solution to these challenges is often sought in the use of technological tools such as virtual learning environments for scaleable and flexible delivery, and to enable active learning by providing students with access to a wealth of knowledge and the means to interact with it, their teachers and their peers (Conole & Oliver, 2007). However, the effort entailed in developing effective e-learning activities and resources is considerable and provides a strong incentive to share and reuse practices that have been developed and found to be effective. So far, though, there is little evidence that pilot projects in these areas have been taken up and adopted into widespread practice – e-learning has not yet become sustainable (Collis and Van der Wende, 2002; Seufert and Euler, 2004).

To address this issue, Glasgow Caledonian University has recently established the Caledonian Academy, which aims to tie e-learning research into development of learning and teaching practice at Glasgow Caledonian in a close synergy. Two recent research projects illustrate the approach we are taking: the Models of Practice (Mod4L) project has looked at representational issues surrounding the sharing and reuse of learning designs, while the Community Dimensions of Learning Object

Repositories (CDLOR) has looked at the needs of the potential user communities, as well as socio-cultural, organisational and pedagogic issues in the implementation of repositories (Falconer et al., 2007; Margaryan et al., 2006). Both these projects have been based on the philosophy that, if e-learning is to be embedded in practice, then practicing teachers need to be involved at every stage of development, rather than having solutions thrust upon them.

2. The Models of Practice project
The Mod4L project was part of the Joint Information Systems Committee (JISC) Design for Learning programme. "Design for Learning" may be defined as "designing, planning and orchestrating learning activities as part of a learning session or programme" (JISC 2006). A "learning design" is the outcome of this design process[1]. Learning designs have been known to further education teachers for a long time as "lesson plans", but are relatively unknown in higher education. A design may, and frequently does, exist purely in the head of the teacher implementing it. However, as Vogel and Oliver (2006) point out: "in order to be comprehended by others, designs must also be represented or articulated." However effective a design may be, it can only be shared with others through a representation that communicates its structure and purpose. Efficient sharing and reuse can take place only if the representations are effective; they must convey the information that teachers need in a form that teachers can understand. The aim of the Mod4L project was twofold: to derive generic learning designs from examples of effective practice, and to develop effective representations of those designs. To this end the project worked closely with a focus group of tutors and lecturers discussing their use of, and requirements for, representations of learning designs.

A major finding has been that if the aim of sharing learning designs is to support practice change, then generic representations, such as those initially suggested, are not particularly effective. To adopt a new practice teachers need confidence that they will be able to perform it well in the dynamic environment of a classroom situation, which means that the representation must allow them to relate the new practice to their existing experiential knowledge. Two principle means of doing this are suggested, firstly through richly contextualised examples that help to surface tacit knowledge, and secondly through much greater support for communities of teachers around issues of e-learning innovation.

Recognising that to be effective, a representation must be fit for purpose, the project has also examined different potential purposes of representations of learning designs. In particular, it has looked at four stages of sharing and reuse of designs: browsing/searching for a design to use; choosing a design; editing and developing it for one's own situation; and implementing it. To support these stages, teachers appear to need eight broad categories of information about: Instantiation; Adaptability; Pedagogy; Discipline; Environment; Audience; Quality; and Operational Factors. However, they do not need all this information at every stage of sharing and reuse. Indeed, to present all this information all at once would be overwhelming. The Mod4L project argues that different representations are needed to support the different stages, has examined what information is needed when, and evaluates the

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[1] We follow emergent convention here in distinguishing between "learning designs" (lower case "l" and "d") as defined above, and Learning Designs which are a specific representation of learning design conforming to the IMS Learning Design specification

usability at each stage of a number of existing ways of documenting a learning design. These recommendations, then, will inform the final stages that complete a cycle of sharing and reuse – reflection on how the lesson went and publication back into a repository – ensuring that publication is in a form that then supports future sharing.

3. The Community Dimensions of Learning Object Repositories project

The CDLOR project was funded by the JISC to identify and analyse the barriers and enablers that influence implementation and use of learning object repositories (LORs) within a range of different learning communities. LORs are a recent technological innovation aimed at supporting sharing and reuse of resources for teaching and learning. They are collections of digital "learning objects" that are designed to be integrated, aggregated, and sequenced in an efficient way to produce "units of learning". Resources in such repositories are collected on a personal, departmental, institutional, national, regional, or international basis. Examples include, JORUM (a national repository), the WM-Share project (a regional repository), SIESWE learning exchange (a subject-based social work repository), and institutional repositories such as Aberdeen University's. The uptake of repositories, however, has not been straightforward. As with many other learning technology innovations, LORs often seem driven by the theoretical potential of database technology itself rather than by the practical needs of learners and teachers and the socio-cultural contexts of the communities which they aim to serve. As a result, the pedagogical, social, and organisational aspects of these communities have not been at the forefront of the design and development of LORs. Working with the curators of ten different repositories, and their users, the CDLOR project aimed to identify the key characteristics of user communities, the potential purposes of a repository, and highlight that alignment between the two is essential to the repositories success. The project has produced guidelines for developers to support systematic analysis and identification of such factors and issues in the design and development stage of a repository and guide future implementation (Margaryan et al, 2006).

The CDLOR guidelines identify seven dimensions of learning and teaching communities that have implications for the sharing of resources and their use of LORS: purpose of the community; composition of the community; modes of dialogue and participation; roles and responsibilities; coherence of the community; context within which the community exists; and pedagogical approaches used within the community. Added to these seven community dimensions are six dimensions of the repository itself that have implications for its use: purpose of the repository; subject discipline; scope (national, international etc.); sector (school, further education, hobby based, etc); contributors (teacher, publisher, enthusiast, etc); and business model of the repository.

The guidelines outline ten questions that will help developing repositories to establish and analyse these dimensions, and recommend rapid prototyping and iterative design models, based on thorough user needs analysis and involvement of users at each stage of design, development, implementation and evaluation of the repository to ensure that community needs are met.

4. Conclusion

Both the Mod4L and the CDLOR projects have worked closely with users in arriving at their conclusions and recommendations. The challenge for the Caledonian Academy now is to put these recommendations, similar outputs from other projects and their underlying philosophy of user engagement, into practice within Glasgow Caledonian University. The Academy has two strands, professional activities and research, working in close harmony. The professional activities strand is developing a user-centred approach to staff development that aims to foster scholarship in learning and teaching among all staff at Caledonian and will both inform, and be informed by the research strand, and thus embed sustainable e-learning.

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LIVE LEGO HOUSE, A MIXED REALITY SPACE FOR THE EDUTAINMENT

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Abstract
Gaming is a natural way of learning and multimedia technologies bring new possibilities in the field of edutainment. Live LEGO House in an interactive space to explore coexistence and multicultural factors through gaming based on the Mixed Reality (MXR) technology. The system consists basically on a physical/real house built with the LEGO blocks, which is enriched with different non-physical/virtual multimedia files, including sounds, videos and 3D animations with multicultural content. Children interact with the house via two dolls, each of them having different characteristics and needs. They (children) will need to agree in some aspects in order to play the game properly, to coexist. Tactile, visual and auditory stimuli are present in the game.
Keywords: mixed reality, interaction, edutainment, technology.

1. Introduction
Edutainment (also educational entertainment or entertainment-education) is a form of entertainment designed to educate as well as to amuse. Edutainment typically seeks to instruct or socialize its audience by embedding lessons in some familiar form of entertainment: television programs, computer and video games, films, music, websites, multimedia software, etc. Most often, edutainment seeks either to tutor in one or more specific subjects, or to change behaviour by engendering specific socio-cultural attitudes. Successful edutainment is discernible by the fact that learning becomes fun and teachers or speakers educate an audience in a manner which is both engaging and amusing (Wikipedia, 2007).

Multimedia technologies have demonstrated a great potential in the field of education, since they offer an excellent technological base for the training and transmission of knowledge, which generates more efficient methodologies of education and learning. Equally in the area of entertainment and leisure, these technologies open new perspectives that offer new chances in this important human facet.

Live LEGO House (LLH) is an interactive game for children based on the MXR technology, which takes great advantage of multimedia systems (sounds, images, videos, etc.). It is thought to entertain as the same time as to educate in the area of coexistence and multicultural factors. Nevertheless, education is not explicit, as no rules are necessary to play. Two dolls – led by two children – will have to interact with the house, discovering a place where plenty of sounds, videos and 3D virtual objects will respond to their acts. But actions do have consequences, so they have to decide what to do: what they want or what seems to be better for both.

LLH has been specially developed for, but not restricted to, children between 3-7 years old. To keep children's attention at these ages, a large variety of funny sounds, graphics and videos are introduced. The thematic of all these media is 'multicultural', so children can indirectly learn about other cultures. Furthermore, in order to reinforce good environmental and social concepts, some restrictions regarding to water and sound are introduced, in such a way that positive coexistence between players is fomented.

This application was developed by the author in Singapore, while a research intern at the Mixed Reality Lab. The idea of developing a game based on coexistence and multiculturalism was born there. One of the characteristics of Singapore is the actual coexistence between people from different races (Chinese, Malaysian and Indian) and religions (Buddhism, Islamism, Catholicism, Hinduism, etc.), and even different mother languages (Mandarin, Malay and Tamil), all of them having English as a unifier. Although there are some characteristic ghettos (as Chinatown), cultures are quite mixed. Some examples of this coexistence are: people from different countries live and work together, respecting their culture and traditions; a Hindu Temple can be found in Chinatown; all kind of traditional food is offered at the stalls of a single hawker centre; different traditions are celebrated during the whole year; different languages are in use with the English as link; etc. Nevertheless, an "equal" coexistence is still not a fact, but this seems to be more a problem of social class and/or poverty than of cultural roots. Some of these coexistence facts are shown in LLH by means of some videos that have been recorded there.

2. Edutainment through MXR

MXR refers to the combination of computer graphics and real-world objects. This encompasses both augmented reality, which involves placing computer graphics objects into the real world and augmented virtuality, which involves placing real-world objects into virtual environments. MXRToolKit (2007) consists of a library of routines to help with all aspects of building mixed reality applications. The philosophy of the SDK is to keep the interface extremely simple. Therefore, one of the advantages of the MXRToolKit compared with other marker based programs is the speed with which you can write your own applications – even for non-programmer experts – and integrate different kind of multimedia files (sound, videos, 3D objects, animations, etc) in a single project.

Comparing MXR applications with Virtual Reality, two major advantages stand out:
1. **Collaborative reality**. Mixed reality allows users to interact with graphical objects while still letting them to see the real world. Several users can collaborate with a computer generated object as if they were real world items, thus leading to a natural human-human interaction.
2. **Tangible interaction**. Computer graphical objects can be attached to real-world physical objects by means of markers. By manipulating the position of the real object, we can correspondingly manipulate the position of the virtual object. This is known as "tangible interaction" and provides an extremely natural interface for manipulating computer generated objects which does not need to be learnt by the user.

The game can be divided in the following steps:
1. Construct your own house: use your imagination and creativity to build a house within the LEGO blocks.

2. Tell the program where the objects are: this is called the calibration process. Simply by pressing some buttons on a prepared keyboard you tell the pc how your house is arranged. Nevertheless, this step is perhaps too difficult for small children, so they will need some help.
3. Explore the matters of coexistence and try to solve them wisely: you will discover how to play taking into account your partner.

3. Game design

According to (Liarokapis, 2006), important issues of game design in MXR include:
1. Technical characteristics: advanced visualization and interaction; adaptability and usability issues.
2. Interactivity: advanced using computer sensors and natural methods.
3. Social, cultural, and pedagogical issues: can be direct and indirect.
4. Collaboration: can be direct and/or indirect.
5. Game scenarios: more pragmatic; need to merge scenario with real world.

In the following sub-sections, these issues are seen in more detail for the LLH.

3.1 Technical characteristics

LLH is built within the MXRToolKit, which consists of a library of routines to help with all aspects of building mixed reality applications. The whole system of the LLH consists on (figure 1):
- A computer work station, with the MXRToolKit libraries;
- Display system: a computer screen;
- Tracking system: a web cam and MXRToolKit square markers;
- Tangible part: The LEGO blocks that form the house/furniture and the dolls;
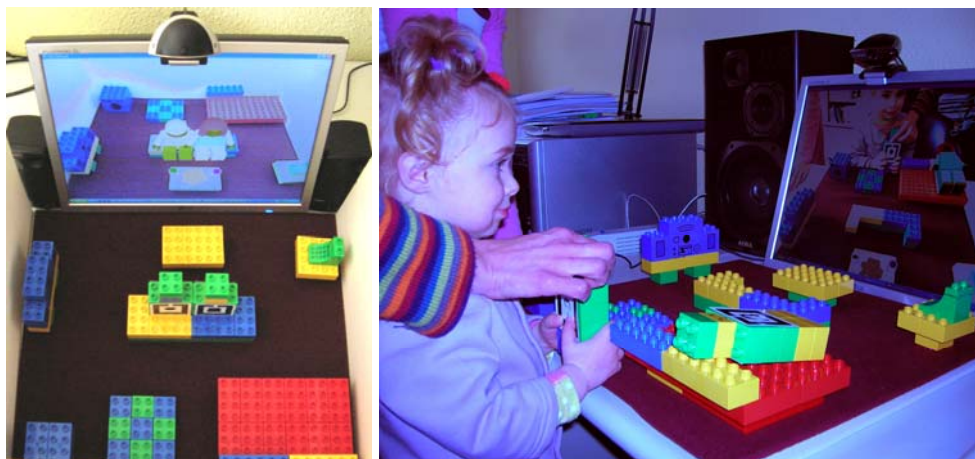- Two speakers where sounds are reproduced.

Figure 1: Left: LLH environment; Right: small child playing with her mother

MXR markers are necessary in order to run the application. Here are the total amount of multimedia files, frames and markers used in the LLH:
- Amount of multimedia files: 65
    - 3D Objects: 14
    - Sounds: 45
    - Videos: 6
- Amount of defined frames: 16
    - Dolls: 2

- - Furniture: 14
- Amount of markers: 5
  - - 4 real (dolls)
  - - 1 virtual (rest of frames)

As can be seen, a huge variety of multimedia files are present in the game, with a view to increase the playful possibilities. The total amount (65) compared with the 4 single markers that the user can see is quite unusual in this kind of application as normally one multimedia file is related to a single marker (or even to a single set of markers), but this has the disadvantage that only a reduced amount of multimedia files can be used, as increasing the number of markers would slow down the system, or would even cause the system not to distinguish properly between markers (this is related to the camera resolution and the markers size). It would be quite hard to build an application with the MXRToolKit by using a total of 65 markers. Furthermore, for the LEGO Live House it was thought that using so many markers on the LEGO blocks would be unattractive. Also the problem of a user hiding markers while playing would be a great problem. Three steps were thought out in order to reduce the amount of markers:

1. The first step was to assign different multimedia files to the same marker. These multimedia files are rendered depending on the actions of the user. For example, when a user comes close to the radio, the radio is on and some music is played; the user can change the music by a rotation (pitch value: rotation about Y axis).
2. The second step was to 'remove' all the physical markers that remained still with respect to the camera. This is possible because the camera remains still (HMD is used) and is based on the mathematical principle that this kind of marker would have a constant transformation (rotation & translation) with respect to the camera. The objects that remain are also still: the furniture of the house, so the physical markers for them are not needed.
3. The last step was to join all the furniture markers into a single marker. This can be done because the program is never going to 'physically' find the marker. This single marker is referred as a 'virtual' marker.

Users can build the house as they wish. That means that furniture do not remain in the same position with respect to the camera depending on the users. But, at was explained before, the transformation matrix of furniture should be known beforehand, as markers are not placed on the objects. That means that whenever the application is started, the user should 'tell the program' where the real objects are placed. This step is called 'calibration procedure', where the user should tell the program where the objects are by means of the keyboard. When the doll is placed next to each of the objects, the user has to press the corresponding key; at that moment, the transformation matrix of the doll is passed to the furniture.

Some further aspects should be considered in order to build the MXR scenario properly for the LLH:

1. **Reflective surfaces of the LEGO blocks**. Reflected light is a problem in these kinds of applications, where tracking is based on marker recognition. LEGO blocks are quite reflective, especially light colours. To solve this problem, in the last version of LLH the surface of the ground was covered with deep-red velvet.

2. **Field of view of the camera**: As the markers on dolls are small (3.5 x 3.5 cm), the camera should be close to the house. The closer the camera is, the less part of the house is seen. Therefore, a web cam of a wide field of view is preferred. The Live! Cam Voice of Creative is in use. This is a USB 2.0 web cam with a video resolution of 1280 x 960 at 15fps and a FOV of 85º. Radial distortion is automatically corrected.

3. **Occlusion**. In the LLH the occlusion problem comes out. This is a typical problem in MXR technology, and arises when real objects are placed in between virtual objects and the camera, because the virtual objects are always rendered at the top, hiding any object that is in the video-image. To solve occlusion, sophisticated techniques are required (Breen et al., 1996; Fischer et al., 2004; Lepetit and Berger, 2000), which are not available within the MXRToolKit. There is a simple way to avoid occlusion in LLH: first of all, the camera should be placed at a higher position than the house (around 20 cm above), pointing down; secondly, the furniture of the house should not be that high (max. 3 blocks). With these two simple considerations, the occlusion can be avoided. This fact is illustrated in figure 2, where the real doll is placed in between a table (in red, at the back) and an armchair (in blue, at the foreground). In the first case, placing the camera too low makes evident the occlusion problem; in the second case, with the camera at a higher position, the occlusion is avoided.

(a)   **(b)**
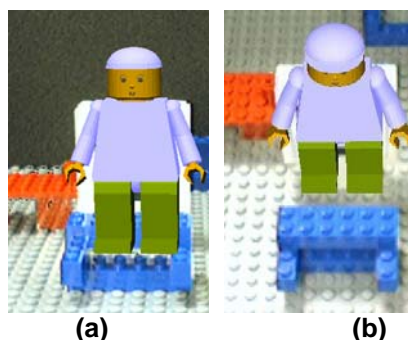
Figure 2: Image showing the occlusion problem: (a) with the camera at a lower position; (b) with the camera at a high position enough to avoid occlusion.

3.2 Interactivity

3.2.1 The house

The house is the interactive space where the MXR happens. The camera pointing to the house is like an eye that registers the actions of the dolls, and acts accordingly. Thus, it can be said that the house is 'alive', as different multimedia files will be shown depending on doll's behaviour, e.g. good actions (positive coexistence) will be rewarded, whereas bad actions (negative coexistence) will lead to some kind of punishment (e.g. prohibition of listening to the music while your partner is sleeping). Therefore, it can be said that rather than the users, the house is the one leading the game.

3.2.2 The dolls

Human-computer interaction is achieved through markers attached to real dolls. The development of amicable interfaces is a key goal to achieve, so that even users not familiar with computers can enjoy the advantages that they offer. This implies the elimination of the 'digital gap'. If someone is asked to communicate with a computer, they may think of a mouse, a keyboard or a joystick as the 'normal' interfaces. Most people probably do not ever think about a 'doll' as an interface. But this is exactly

what happens with the LLH: the mouse is changed by a doll, making the interaction more tangible. This is in fact a natural interface for children which they do not need to "learn" beforehand.

Interaction is triggered by two ways (table 1): by dolls' proximity to the elements of the house or by dolls' tilting (roll and pitch).

Furniture	Interaction	Actions	Multimedia Files
Washing machine	Proximity /	Put the washing machine / Prohibition	Sound: Washing machine on 3D: Water prohibition signal
Radio	Proximity / Roll	Turn on the radio / Tuning the radio / Dance / Prohibition	Sound: Different songs & radio programs 3D: Animated dolls dancing / Sound prohibition signal
Armchair	Proximity / Pitch	Sit down / Eat / Drink / Yawn	3D: Dolls sit down, drink & eat / Glasses with juice / A plate with cookies Sound: Eating / Drinking / Yawning
TV	Proximity /	Turn on the TV / Change TV program	Videos: Different videos
Bed	Proximity / Pitch	Put the pyjama on / Close eyes / Snore / Dream	3D: Dolls wear pyjamas / Animated dreams Sound: Snoring
Shower	Proximity	Undress / Have a shower / Sing	3D: Nude dolls / Water prohibition signal Sound: Singing / Falling water
Telephone	Proximity / Roll / Pitch	Make a call / Telephone ring / Prohibition	Sound: Making a call / Telephone ringing / Picking up the telephone / Say hello 3D: Sound prohibition signal

Table 1: Furniture related to interaction, possible actions and multimedia files.

The sequence of actions by a single doll also conditions multimedia files. This is technically managed with some kind of variables associated to the real objects and gives a 'surprise' element to the game. Therefore, users have the feeling that the multimedia files do happen randomly, but in fact they are not random.

Also, restricted actions are introduced to water and sound. Daily amounts of water are restricted, so dolls cannot have too many showers or put the washing machine on too many times per day; to have more water, they have to wait till next day (go to sleep!). But when a doll is sleeping, the other doll cannot switch the radio on or make a call.

3.3 Social, cultural and pedagogical issues
Social, cultural and pedagogical factors are implicit in the LLH via the multimedia files, which include sounds, videos and 3D-objects. Further pedagogical factors are implicit within some restrictions included in the game that somehow reward positive coexistence.

3.3.1 Sounds
Sound is a very important part of the game. Some of the sounds have been taken from the web page of the Spanish Ministry of Education and Science (2007), for example: falling water, singing in the shower, tuning the radio, telephone ring,

snoring, laughing, eating, etc. Songs related to the LLH radio are multicultural: samba, paso doble, rumba, waltz, sirtaki, tribal, traditional Chinese, etc. Afterwards, these sounds have been edited and others designed by electronic synthesis in order to enrich sound texture and timbre. This gives an interesting and 'funny' touch to the game that will catch children's attention. Moreover, each time a doll interacts with an item, the sound changes; for example, a total of 10 different rings are related to the telephone, and more than 30 songs are linked to the radio. The large variety of different sounds included in the game, makes the experience more playful and increases children curiosity.

3.3.2 Videos
The TV is one of the central elements in the game. Users will pay attention to what is happening inside. This element is also interactive, and it will show the augmented dolls (when TV is off) or some video files (when TV is on), depending on users' actions:
- If any doll is sitting down on their corresponding armchairs (yellow for LEGOwoman and blue for LEGOman): the TV is off and the AR scenario is shown.
- If at least one doll is sitting down on its armchair: the TV is on and a video file is rendered.
- If both dolls are sitting down on their armchairs, only a common program that delights both dolls is seen.

The videos are also multicultural, which were recorded in Singapore.

3.3.3 3D-objects
The 3D objects (figure 3) were modelled with the 3DStudioMax software. Within this, some objects were animated (for example, when the dolls are sleeping). Afterwards, the objects were exported into the VRML format in order to be rendered by the MXRToolKit.

As is evident, the dolls have been modelled according to the original LEGO dolls. This means that no extra 'bending' has been introduced: for example, when the dolls are sitting down, the entire leg is a single block. Also no gender has been added: when the dolls are having a shower, both bodies look the same, and man/woman can only be distinguished because of the hair.
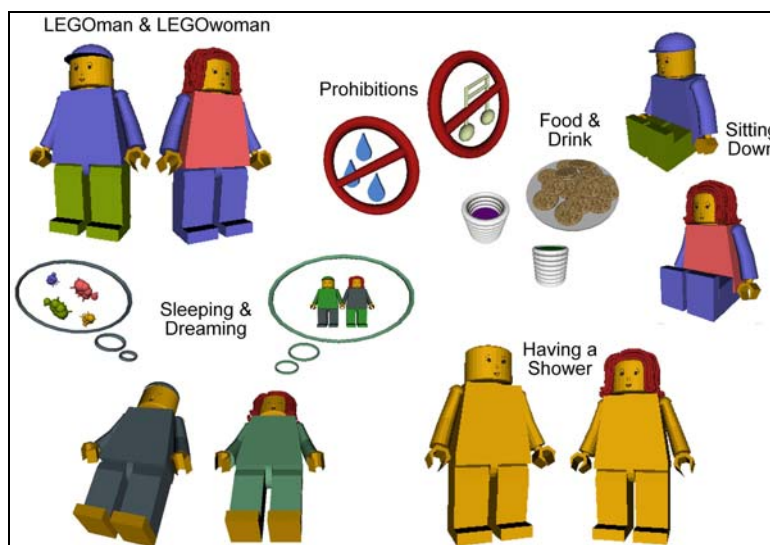
Figure 3: 3D virtual objects.

3.4 Collaboration

In LLH children collaboration is achieved face-to-face. Children will have to agree in some aspects, as the sequence of their actions condition the multimedia files that are rendered, and actions of a doll conditions the other doll. These dependencies are made in order to foment positive collaboration. Negative coexistence is avoided via some kind of restrictions and/or prohibitions related to sound and water. For example:

- If both dolls are watching TV, a program that delights both will be displayed. If children want to change a TV channel, they will have to agree (one doll should get up from the armchair).
- If one of the dolls is sleeping, the sound is not allowed, which means that the other doll cannot listen to the radio or make a telephone call.
- If one doll has too many showers in a single day, no more water is left, and the other doll cannot have a shower or put on the washing machine.
- If a doll sits in front of the table to have lunch, it only will be able to eat or drink, but not both at the same time. To have lunch properly, both dolls need to do the action at the same time.

Therefore some funny situations can arise: when the amount of water is finished, they have to wait till next day to have more, so both dolls have to go to sleep; but when a doll is sleeping, the other cannot switch the radio on or make a call. Therefore, children would need to agree in order to control the game properly. Mutual agreement will lead to positive coexistence, thus social factors are once more fomented.

3.5 Game scenarios

Game takes place in a mixture of real and virtual environments, in the real house and in the house shown on the screen. Commonly, AR is thought to be mainly visual. But it has to be noticed that, although video-based approaches are the primary interest in AR environments, sounds or other kind of media can be incorporated in order to enrich the experience. According to the virtual stimulus, the LLH scenario integrates the three possibilities, which are tactile, visual and auditory, as olfactory and gustatory do not have their virtual equivalent. According to Barfield et al. (1995), this

represents the most advanced multi-modal AR. That means, children can touch, see and hear in the LLH game. Figure 4 shows some samples of mutual coexistence.
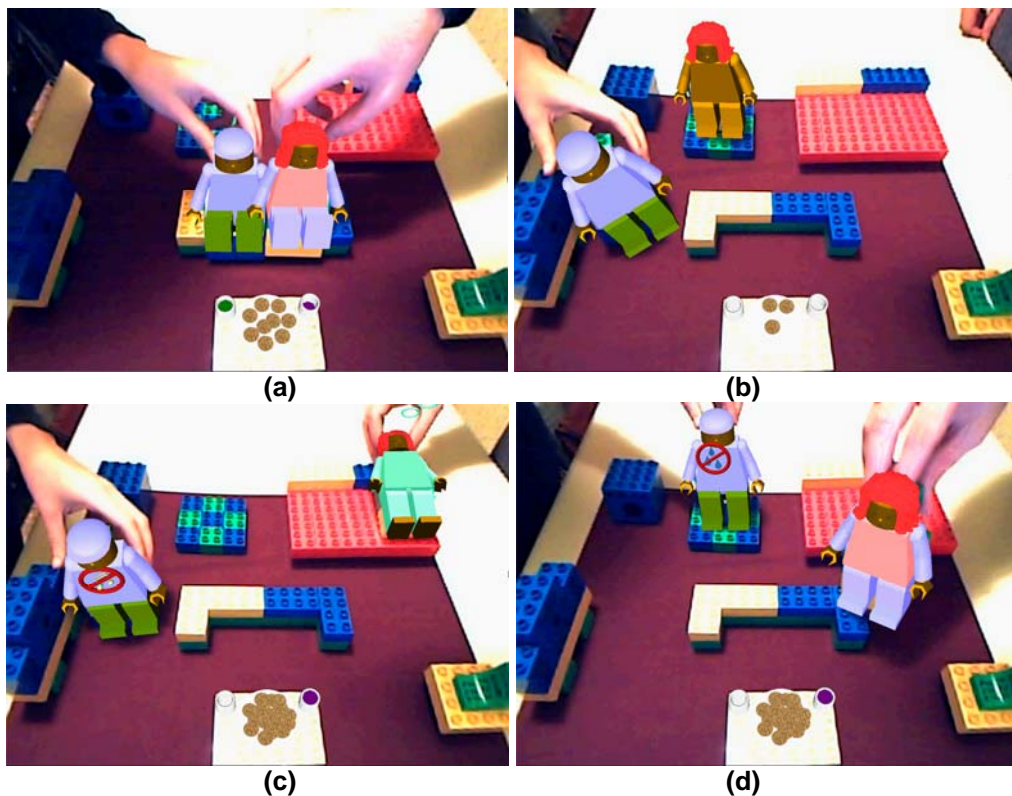
Figure 4: Mutual coexistence at the LLH scenario. (a): both dolls are having lunch together; (b): one doll is having a shower and the other is dancing next to the radio; (c): one doll is sleeping, so the other cannot make sound (radio off); (d): one doll tries to have a shower, but the amount of water per day has been exceeded.

4. Conclusion

In this paper, the Live LEGO House interactive game has been shown. This game is based on the MXR technology and has been thought to entertain children as well as to teach them in the area of coexistence. The learning process is not explicit, and positive and/or negative coexistence arise through exploration. Some advantageous characteristics of MXR that stand out in this game are collaborative reality and tangible interaction. These imply that children can play together and also interact with a computer in a natural way with no previous knowledge. LLH retains the basic LEGO model, allowing children to collaborate and use their imagination and creativity while playing, but adds some kind of multimedia files that enrich the game experience and foment other kinds of mutual collaboration and interaction.

Although some works have been developed within the MXR technology in the area of entertainment and/or education (Cheok et al., 2002; Andersen et al., 2004; Galantay et al., 2004; Brederode et al., 2005; Metaxas et al., 2005; Cheok et al., 2006), demonstrating a great potential in these fields, MXR for edutainment can still be considered a novel tool, and more research would be necessary, placing special emphasis on user experiences and learning processes.

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ANAXAGORA - AN OPEN SOURCE ORGANIZATIONAL LEARNING PLATFORM

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Abstract

AnaXagora, a free and open source organizational learning platform has been developed as an answer to the needs of small and medium-sized enterprises (SMEs) in Luxembourg. Indeed, analyses of the Luxembourg e-learning market characteristics showed that e-learning was not used much in Luxembourg, mainly because platforms were not adapted to the real market needs and evolutions, and are too expensive for SMEs. Companies want their employees to follow training routes and develop competencies linked to their specific business domain. This is possible with AnaXagora, as the platform gives the possibility to model business processes, manage knowledge and competencies, and follow online training programmes.
Keywords: organizational learning, learning management system, business process modelling, knowledge and competencies management, open source.

1. Introduction

In 2003, 2004 and 2006, surveys have been conducted in Luxembourg, in order to analyse the e-learning market characteristics in the country. Training centres and companies were questioned and the main observations have been the same in those three years. E-learning trainings are not widespread within Luxembourg SMEs, who sometimes do not even know what e-learning is. They lack expertise in the domain, but the main reason they mention is that the existing systems are not complete enough. Actually, they would like to link trainings to their business processes, to make sure their employees will develop the competencies required for the core business of the company. Consequently, the AnaXagora platform has been developed to give Luxembourg SMEs the possibility to have a tool to support the whole learning process in their organizations.

2. Towards an organizational learning support platform

In 2002, the Public Research Centre Henri Tudor started to develop a Learning Management System (LMS) withinin the framework of a European project. Many LMSs had already been developed, as we can see in the study conducted by Le Préau (2000). However, they did not offer all the functionalities needed for the courses developed in the project. Indeed, based on the open source platform Ganesha (Anemalab, 2001), we developed new functionalities, like an individualized learning path, SCORM compliancy, course templates to facilitate design, etc.

However, AnaXagora LMS, like other LMSs, only allow the possibility to create, follow and manage e-learning trainings. But, nowadays companies do not only want their employees to follow standard trainings; they want those trainings to be integrated in a complete competency-based and knowledge management strategy. Moreover, the Educational and Cultural General Direction report (European Commission, 2005) says that "*the professionals – suppliers of e-learning – should*

offer innovating solutions meeting the specific needs for SMEs". In order for the trainings to be adequate for business processes, they need an appropriate integrated tool. Indeed, there are different existing tools to manage competencies or to model business processes, but separately, meaning they cannot exchange information. That is why the Public Research Centre Henri Tudor further developed AnaXagora, which is an LMS but one which now has four integrated modules exchanging information, as we can see in Figure 1:
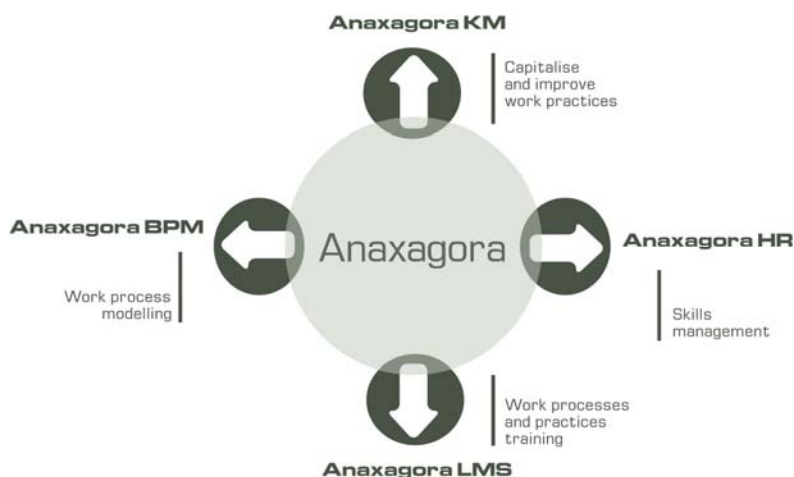
Figure 1: AnaXagora platform

As the different modules can exchange information, it is then possible to adapt training contents to the companies' core activities and to the competencies required to perform them.

3. Using AnaXagora

We can illustrate the use of the AnaXagora platform with the example of training design (Figure 2). In the BPM module, the training design process can be graphically represented①. Writing the learning objectives is one of the process activities②. One of the input documents is the training specifications and it is the training designer who is in charge of this activity.

To perform this activity, the training designer needs specific competencies. They are defined in the HR module③. He can also evaluate himself in this module, to see if he already has those competencies④.

The competencies he has already acquired can be capitalized in the KM module, where he can also share personal documents that could be useful for his colleagues⑤. As for the competencies still to acquire, he can follow the available trainings in the LMS module⑥.
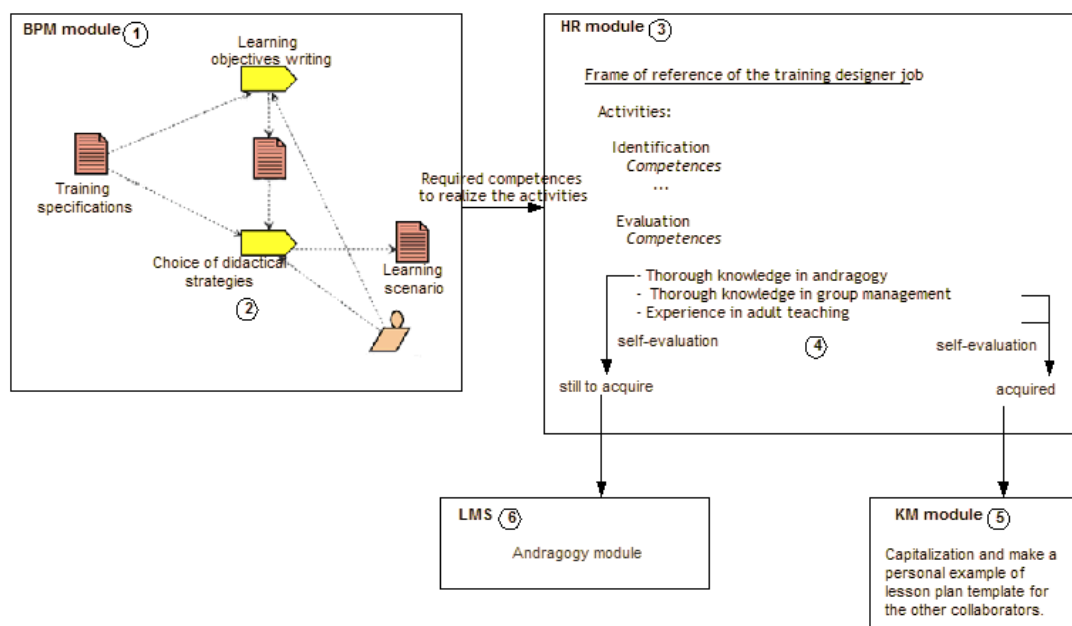
Figure 2: AnaXagora use example

4. Conclusion

The four modules of AnaXagora were developed separately, in different research projects. They are based on other open source applications. Now, they have been integrated into one global platform, with a common interface. Indeed, AnaXagora is an open source platform. In this way it is easier for companies to adapt it to their specific needs. And as it is free, it will also allow them to invest more in the content rather than in an expensive tool.

The platform was developed according to the needs of Luxembourg companies identified by the Public Research Centre Henri Tudor. Its evolutions are still linked to their needs. One of the e-learning usage factors considered important is the ease with which the tools are available for those companies. As such, the tools need to be flexible and easily adaptable for e-learning usage to increase.That is why in the future the computer-based testing services will be added to the platform as well, in order to offer the possibility to evaluate competencies via adaptive tests.

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VIEWS FROM THE BRIDGE:
PUBLISHING AS A VOYAGE OF DISCOVERY

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Abstract

eSharp is a multidisciplinary, peer reviewed, online journal for postgraduates in the arts, humanities and social sciences. This paper places this innovative student-led e-learning project within the current context of British Higher Education, discussing its achievements as an entrepreneurial project that bridges the divide between the increasingly marketised UK university agenda and the journey of scholarly discovery which postgraduate education still embodies. The paper goes on to discuss the history of eSharp, from its inception in 2002 to it becoming an international venue for postgraduate research, which challenges traditional modes of scholarly publication. Postgraduate training, provided by the project is then discussed, before the eSharp is placed in the broader philosophical context of UK higher education.
Keywords: eSharp, ejournal, postgraduate training, entrepreneurialism, postgraduate publishing

1. Foreword

> *He was still wondering about the places beyond, from which understanding comes, when he found himself at the foot of a fabulous bridge. The bridge, completely suspended in the air, held up by nothing that he could see, was a dazzling construct, composed entirely of mist.*
> (Okri 1995)

The *eSharp* project has come into existence at a time of great change in the landscape of postgraduate study in the U.K. As such, the eSharp project is no accident. It is not a magic trick. It is possible to read its existence as an example of successful entrepreneurialism. It is, to use a metaphor, an example of the building of a successful bridge. We are, after all, all now living in a higher education world which calls upon us to continually innovate and which rewards enterprise, particularly the kind that brings in money and prestige, more higher than anything else. Higher education today needs to see pathways opened up between people on different banks of research rivers. It is important for the trade into and out of the universities to be backed up by the right kind of infrastructure to aid what have become known as 'knowledge flows'.

The *eSharp* team have grown up in the world of neoliberal economics. They understand about gateways, bridges and markets. The majority of them are Thatcher's Children and Blair's Graduates. Their project is manna to those who need to have successful initiatives to point to, those in higher education management who have to continually audit in order to prove that quality work is being done. The evaluationist culture loves *eSharp*. It does the trick.

But others love *eSharp* too. In the contributions from Daniel and Lucy which follow this section we can detect a palpable excitement; the excitement of discovery, the excitement of shared knowledge, the excitement of a common, beloved co-creation, the excitement which fosters energy, ideas, determination, perseverance, hard work and mischief. We should believe in *eSharp* because it has provided a way of tackling one of the biggest challenges to graduate research life in the arts, humanities and education: isolation. *eSharp* is not just a journal or a training vehicle, it is also the real thing – a real, live, genuine, believe-it-or-not living and breathing *research culture.*

Since the last research assessment exercise we have run away from such words, knowing, as academics, that very much of what is pointed to and claimed – by the evaluationists – to be a research culture is in actual fact a thinly veiled camouflage for internecine warfare, one which often actively prevents genuine research. Research culture for many academics today involves writing precisely the kinds of business plans they went into academia to avoid ever having to write. And yet, here, with *eSharp,* we find the new generation of researchers carefully, confidently entrepreneurially creating their own resistant and responsive version of a research culture.

2. *eSharp* Narrative and History – Daniel Soule

eSharp is one of the new and multiplying breed of postgraduate e-journals in the UK. Based at the University of Glasgow, it is run by postgraduates for postgraduates and postdoctoral researchers in the Arts, Humanities, Social Sciences and Education. Multidisciplinary and open access, the journal aims to be a gateway to scholarly publication for emerging academic talent from UK and international institutions, supporting and nurturing new postgraduate and postdoctoral research publication. Ambitious and vigorous, the project has surpassed the expectations of its original founders, flourishing through hands-off institutional support and the collective endeavour of graduate students. The *eSharp* project is dynamic at several levels: firstly in its position as a market leader of an emerging sector of academic publishing, which in many ways replicates traditional journal publication, but in other ways subverts and challenges the established gatekeepers of academic knowledge. Secondly it is a student-led project that embeds both employability and reflexivity in postgraduate research studies.

At first sight *eSharp* looks much the same as established paper journals, though its preferred mode of production is electronic and open access. Articles adhere to the conventions of the scholarly journal genre and are published in a manner that replicates the double-blind peer-reviewed, copy-edited and fully referenced format. Articles address the academy in the fields and manner to which it is accustomed but postgraduates and postdoctoral researchers manage and produce the journal. Like traditional paper journals the new breed of postgraduate e-journals function like their predecessors in that the process of peer-review and publication replicates the manners of communicating in the academic discourse community. However, for some the very idea of postgraduate and postdoctoral researchers being central in the peer-review process is to undermine important codes of practice that secure the validity of the work of the research community. Another perspective might be that devolving the mechanisms of control in the research community not only empowers emerging talent but also places a greater responsibility on their shoulders. At an earlier stage in their careers academics will better understand the demands of academic practice and as such become more conversant with the codes of practice

of the research community, of which they are now the custodians. The *eSharp* project hopes to give validity to the latter assertion, and the following discussion will hopefully give weight to that contention.

It is in the management of the journal that the editorial board obtain skills which enhance and go beyond the usual experiences and training researchers might normally expect in their studies and university research training schemes. *ESharp* facilitates its host university's fulfilment of the Joint Research Councils' Skills Training Requirements, as running the project presents board members with challenges both directly relevant to their studies and which enhance their curriculum vitae with the much-vaunted 'transferable skills'. These include, firstly, research skills and techniques such as the ability to recognise and validate problems, to analyse critically and evaluate one's findings and those of others, and to summarise, document, report and reflect on progress. Secondly, personal effectiveness, that is, demonstrating flexibility and open-mindedness, the ability to acquire knowledge, and show initiative, self-reliance and work independently. Thirdly, networking and teamworking: for example, developing and maintaining working relationships and co-operatives with peers and supervisors in the research community, understanding individual and group dynamics in reaching productive goals, and developing under feedback. Finally, career management is nurtured as members take ownership and facilitate continuing professional development in themselves and others, practically employing the transferable nature of research skills to both academic and non-academic contexts.

The above abstract objectives are achieved through the practical day-to-day running of the journal by the editorial board, who amongst other things: recruit and train peer-reviewers from Glasgow University and beyond, manage the journal's budget, bidding for and then allocating funding, advertise the journal locally, nationally and internationally, organise training events, conferences and publication launches, manage a paperless journal on-line and maintain and improve its website, and manage submissions from authors and co-ordinate the publication calendar with the contributions of authors, peer reviewers and the publication team. However, at the same time as running a multidisciplinary, international journal board members must fulfil their own research commitments. In the current research climate, research students, particularly at the doctoral level, are expected to achieve more in less time, complete a thesis, develop a publication record and obtain relevant work experience for whatever career they pursue after their studies. Although no dispensation is given to board members for their involvement in *eSharp* at this moment, involvement in the project already appears, anecdotally, to have been productive, as previous board members have moved on to employment post thesis. This will be discussed further below as this article moves on to address the nature of the training provision the *eSharp* project provides.

July 2002 saw the genesis of the *eSharp* project, when Glasgow University's graduate school of Arts and Humanities organised the 'Magic' conference. Out of this gathering an idea for an electronic journal run for and by graduate students was borne. The idea became *eSharp*, managed by a handful of students working on their own extracurricular time, to produce an online, open access publication of their conference proceedings. The inaugural issue 'Magic' went live on 31st October 2003, consisting of 17 papers, 10 of which were creative writing pieces. Over the succeeding three years the journal would transform in composition, focus and size.

Evolving from the aspirations of a handful of committed founders to a board of up to twenty, performing five departmental functions, including IT, training, publication/editorial, events/marketing and finance, the journal would remain committed to its open access and multi-disciplinary principles. With May 2004 the second issue 'Trailblazing' arrived through the efforts of an editorial board which had now doubled in size. Again based on a conference by the graduate school of Arts and Humanities the journal published seven papers. However, in addition to its publication schedule the journal began to running training workshops for its peer reviewers and to seek additional funding to support its growing workload and widening sphere of operation.

eSharp has now transformed from a vehicle primarily supporting conference proceedings to one that first and foremost sought out and fostered new work in the form of scholarly articles from postgraduates and postdoctoral researchers. With a larger and more experienced editorial board, two previous editions under its belt and an expanding peer-review database, the journal committed itself to a bi-annual publication programme. To support this programme the journals invested in expanding and improving its infrastructure by running regular training and recruitment events within Arts and Humanities and Social Science graduate schools: recruiting and training both new board members and peer-reviewers. Issue three 'Borders and Boundaries' published fourteen papers in October 2004, 'Journeys of Discovery' followed in May 2005 with fifteen papers. Issues five again published conference proceedings but this time the conference was the result of the interest expressed in issue three 'Borders and Boundaries', and so a subsequent edition was produced to record that interest. 'Identity and Marginality' the sixth issue saw over 50 submissions from five continents. The volume of work involved in managing 50 submissions could only be managed because of earlier investments in the journals infrastructure, operating procedures and peer-review training. Because of the volume of submissions received 'Identity and Marginality' became a split issue, dividing the 17 accepted papers between two editions the first of which was published in December 2005, with the second following in early 2006. The seventh issue 'Faith, Belief and Community' is currently under development and is due online in May 2006.

Publications like *eSharp* present the academies establishment with a conundrum, the puzzle of new and dynamic ways for the dialectic to evolve but a loss of control of some of the dialectic's means of production. For the moment the style of academic debate continues much as it did before but access to the doors the gatekeepers keep is changing. There appear to be new gatekeepers who have cut new keys to old doors, and have found fresh ways to pass through them. At *eSharp* and at other postgraduate e-journals, emerging academic talent has more control of the mode of academic publication. The digital age has a new order of academics coming of age, who grew up with the new technology, it is theirs, part of their thinking, inextricably entangled with their ways of working and living. The old order, like learning a second language, has learnt to communicate in the new medium, but it was not part of their intellectual birth and as such they will never appreciate or understand all of its meanings and potentials.

In addition to becoming one of the largest (in terms of both staff numbers and productivity) postgraduate run e-journals in the UK, *eSharp* can boast several other achievements. The journal has run several successful conferences, and will potentially run further academic gatherings in the future. The 'Borders & Boundaries'

colloquium in Jan 2005 received financial support from the AHRC, had 98 attendees from the UK and abroad, 42 academic paper presentations, 3 postgraduate student training workshops and two eminent keynote speakers in Prof. Sir Bernard Crick and Dr. Rebecca Kay. On July 7th of the same year *eSharp* consolidated its position as a market leader in organising and hosting 'The Future for Postgraduate Journals' conference, bringing together editors from ten of the UK's postgraduate e-journals in the Arts, Humanities and Social Sciences (see Appendix (i)). The conference hoped to share best practice, develop closer working relationships and discuss the future of postgraduate and electronic publishing and was addressed by Clare Morton (Senior Editor Humanities Journals at Oxford University Press). *eSharp*'s commitment to the sharing of best-practice is continued through both adhering to the open access agenda and through board members conference presentations throughout the UK: conferences in 2005 included Dundee University's 'Enhancing Student Employability', UK Grad at Strathclyde University's and the University of London's Institution of Education's 'Horizons and Time'.

eSharp continually endeavours to raise the profile of both itself and that of postgraduate publication. This battle is fought not just for Glasgow University student and staff audiences, but also for national and international academic participation and recognition. At the national level *eSharp* received an ESECT award and accompanying press coverage in the 'Scotland on Sunday' 6th February and in 'EducationGurardian.co.uk' on 5th April 2005. Nationally and internationally the journal has obtained notoriety through the application of electronic mailing lists and via its re-launched website (May 19th 2005). Proof of this can be seen in the patterns of submissions for the recent issue 'Journey's of Discovery' (May 2005).

	Submitted		Accepted	
Glasgow	6	19%	2	14%
Other UK	18	56%	9	64%
Outside UK	8	25%	3	21%
	32	100%	14	100%

Table 1: 'Journeys of Discovery' publication statistics

Table 1 illustrates that less than a fifth of submissions for the 'Journeys of Discovery' issue came from the journals host university, over half were from other UK universities while a further quarter emerged from international universities. Of those 14 accepted for publication only two from Glasgow University were successful, the remaining four-fifths were made up of national and international based papers. This national and international flavour of submissions has continued into subsequent editions. *eSharp* remains steadfast in its commitment to supporting, developing and hosting the up and coming work of emerging academic talent and has no interest in being a parochial vanity press.

3. Some Sharp Words on Publication – Lucy Whiteley

A significant portion of the postgraduate researcher's time has always been spent poring over articles written by eminent names in the field, scouring journals for work that will inspire them, and writing their own essays in order to share their research with others. In these RAE-driven times, the importance of this final task has increased ten-fold: postgraduate students must begin disseminating ideas and

publishing work at an early stage in order to compete with fellow researchers when the time comes to apply for academic positions.

eSharp helps postgraduates in this process whilst simultaneously working to dismantle the barriers of intellectual bias and criticism that surround not only open-access web journals in general, but also the very concept of postgraduate publishing. We do this by producing a high-quality, peer-reviewed biannual journal and by involving an ever-increasing number of postgraduates in this valuable and rewarding project.

The purpose of this section of the paper is to highlight the main stages of our editorial process and to examine in detail the benefits to be reaped from them. Of course, it is not only the submitters who have something to gain from the project; the editorial board, peer-reviewers, and indeed, the postgraduate community at large can, and do, profit from the journal in some way.

The first task of each issue is to decide on a title and to write a Call for Papers. This requires a certain amount of skill and consideration because of the interdisciplinary nature of *eSharp*. We are a journal for the Arts, Humanities, Social Sciences and Education and so the scope of each edition must encompass and encourage submissions across all four disciplines. It is also important that it appeals to an international audience because, of course, the benefit of web publishing is that it extends our academic conversation to the four corners of the world. Furthermore, it is in the journal's best interest to attract a large volume of submissions in order to maintain the high standard of our publication because, for all that we want to provide a stepping-stone toward the world of academic publishing, any compromise on quality would devalue the enterprise for all involved.

The next stage is the submission process itself and this is a busy time for us. For one edition, 'Identity and Marginality', we received over 50 submissions from many countries stretching over 5 continents. This reflects the growing world-wide interest in, and awareness of, our project and makes our project extremely credible in academic terms. Due to this increase in submissions (and the administration it entails), we have been forced to implement a pre-review process, which means that papers will not be sent out for peer-review if they fail to adhere to the submission guidelines.

Arguably the most important and rewarding part of the process is the peer-reviewing. We have a database of nearly 200 postgraduate reviewers whose expertise we call upon to help decide whether the submissions are suitable, significant and competently written. Each paper is assigned to two reviewers, who assess it using our specially designed and constantly updated Peer Review Pack. Bookhouse Publishers recently conducted a study of the review processes in place at some of the major journals in academia, and found that our process was an example of best practice. Our Peer Review Pack is the product of three years' first-hand experience of the publication procedure and highlights one of the key skills acquired by those who join the board of *eSharp*: self-analysis. We continually assess our methods and seek ways to improve our journal and the processes we use to produce it. The review process itself is double blind, and each reviewer must complete three tasks. First, they annotate the article using the comment function of Word to highlight areas that need work, or mistakes that need to be rectified. (Our whole process is paper-free, making it more efficient in terms of both money and time, and also more compatible

with an increasingly technological approach to research.) They then write a review for the editorial board indicating their suggested decision and also prepare a feedback document for the author. This feedback is what makes *eSharp* really special.

All submitters who adhere to the guidelines, whether their paper is being accepted or rejected, will receive two sets of extensive feedback detailing work that needs to be done in terms of content, structure and style. The importance of this critical assessment cannot be underestimated because, too often, supervisors simply do not have the time to do such in-depth analyses of their students' work. One author, whose article we decided not to publish, was keen to thank us for our work and to tell us that she 'will go to subsequent papers with a much clearer sense of expectations and standards for academic papers'.

The reviewers also gain a lot from the experience, given that learning to assess critically the work of other students makes them infinitely more aware when dealing with their own work. One reviewer said: 'I have really learnt a lot from peer-reviewing, it has helped me to analyse my own work'. To help them hone the skills needed to review for *eSharp* we hold regular in-house training sessions, but also recently invited Bookhouse Publishing to hold a workshop which we opened out to all postgraduates in the School of Arts and Humanities here at Glasgow. Such training and hands-on experience will be invaluable to our reviewers when they are called upon to review books and articles later in their academic career. After all, it is this process of publication, review, and dissemination that keeps the academic world alive.

Directly after the reviewing stage comes the decision-making meeting. Each paper is also read by at least one board member to ensure consistency and then, armed with all the advice from the reviewers, we make our selection. Each paper is reviewed on its own merit and we have no fixed limits regarding the size of each issue. However, we do work hard to maintain a balance between the equal demands of keeping our standard high, in order to work against the prejudices surrounding postgraduate journals, and making sure that we provide a gateway into the cut-throat world of academic publishing.

The articles are then returned to the authors, together with feedback reports and advice for improvement as and where necessary. When they are returned, it is time for the board to become copy-editors and to prepare the documents for publication. To help them in this task, there is an internal document highlighting common errors and also indicating reference manuals and guides that can be used to make sure that we produce first-rate copy. Experience has led us to split the process between three teams: one for language and grammar, one for references and one for formatting. This ensures that nothing is missed and also spreads the workload across the board. Furthermore, it is another example of *eSharp's* self-reflexivity. Our ability to adapt and to learn from our mistakes and experience means that *eSharp* is constantly improving, constantly looking for (and finding) ways to make our enterprise more successful, more efficient, and more beneficial to its participants.

Once a final copy-check has been done by the author, the articles are passed to our web team who post them on our website (www.sharp.arts.gla.ac.uk). We organise a launch for each new edition in order to raise awareness about *eSharp* and thus to

increase our readership. Such events also provide an ideal opportunity for us show established academics from Glasgow exactly what we do, helping to break down the stigma that is so often attached to postgraduate publishing. It is also a chance to meet those of our authors and reviewers who live locally. This is important to us, and perhaps the final point to make is that there is a strong social aspect to involvement in *eSharp*. Indeed, one of our intentions is to facilitate and foster a sense of community among postgraduate researchers, not only here in Glasgow, but across the world. The board has regular social events and organises events for our peer reviewers. Not only that, we encourage communication between our reviewers and invite comment on the articles we publish in order to generate an academic conversation to which anyone can contribute and from which all can benefit.

4. Views from the Bridge – Alison Phipps

The brief for the managerial task of implementing the research skills agenda in the Faculty of Arts was to create a place where intellectual ideas can grow. In short, the brief was to build a bridge. The bridge needed to connect the managerial with the intellectual, the well formed with the forming, the skilful with the novice, the money with the need. Heidegger, in his essay, 'poetry, language and thought' ascribes the following qualities to the bridge (Heidegger 1971):

– The bridge *gathers.*
– The bridge grants a way for coming and going.
– The stream and the land are brought into each other's neighbourhood.
– The banks are not indifferent border strips.
– It does not just connect what is already there.
– One side is set off by the other by the bridge
– The waters may wander – the bridge is ready
– The bridge holds the flow up to the sky, taking it to itself for a moment and then letting it flow on.
– Bridges lead….into precincts, into harvest fields
– The bridge escorts the lingering and hastening of people
– It is tied into a network of passages.
– It embodies a striving to surmount all that is common and unsound
– It creates a location.

The bridge is a fitting metaphor for both the gathering and the space that is *eSharp. eSharp* is indeed a network, it holds the flow, taming it, training it, helping the river of intellectual work on its way. The bridge brings people together into relationship and

so does *eSharp*, through its peer-reviewing practices, its conferences, its professional board. Most of the hundred or so people directly involved in the *eSharp* work today would not otherwise have come into contact with each other. in the thick mist and fear that so often obscure the horizons of research in graduate studies, which make it a very lonely affair, the bridge of *eSharp* enables people to realise that their experiences have a commonality and also that they can be commonly constructed. The wayfinding and navigating which can be so tricky when one is working alone, are infinitely helped, for those involved in this project, by the others who meet on this bridge.

So *eSharp* presents us with something of puzzle. It is at one and the same time able to serve the managerial agendas which have all too often blighted much of good intellectual work in the arts, humanities and education with inappropriately imposed paradigms from other areas of research and action and it is able to develop something distinctive and innovative *in its own right.* Rather like Heidegger's bridge – *eSharp* 'lets dwell', changing with each new gathering of people, each change in the pattern of knowledge flows, and yet equally able to provide a solidity and a powerful sense of purpose amidst the changes and chances of academic life. The puzzle is akin to the arch of the bridge described by Calvino in *Invisible Cities:*

> *Marco Polo describes a bridge stone by stone. 'But which is not supported by one stone or another', Marco answers, 'but by the line of the arch that they form.' Kublai Khan remains silent, reflecting. Then adds: 'Why do you speak to me of stones? It is only the arch that matters to me.' Polo answers: 'Without stones there is no arch.'*
> (Calvino 1979)

In the evaluationist age it is the line of the arch, the output and its robust nature, which appear to matter most. The output – *eSharp* – is a key element, it is in many ways what *eSharp* is. The individual stones – those working, learning, reviewing, managing and thinking ahead about the spaces, directions and placing of each article, author, website and review are equally important. And beyond this there is the invisible, intangible and elusive element which keeps the bridge and its span strong. This is something which can only come into play with the tension between each of the stones, and with the genuine completion of the work. The puzzle is the puzzle at the heart of creative enterprise. 'Without the stones there is no arch'.

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Appendix (i)
Participant journals at 'Future of Postgraduate Journals' conference July 7th 2005
- *ManuScript*, Manchester
  http://www.art.man.ac.uk/english/manuscript/body.html
- *Postgraduate Journal of Aesthetics*
  http://www.british-aesthetics.org/Home.aspx?tabindex=6&tabid=63
- *Postgraduate English*, Durham
  http://www.dur.ac.uk/postgraduate.english/journal1.htm
- *The Postgraduate Forum*, Newcastle
  http://historical-studies.ncl.ac.uk/postgrad_forum/about_us.htm
- *Inferno*, St Andrews (art history)
  http://www-ah.st-andrews.ac.uk/inferno
- *Marginalia*, Cambridge (medieval)
  http://www.marginalia.co.uk/
- *British Postgraduate Musicology*
  http://www.bpmonline.org.uk/about.html
- *Forum*, Edinburgh
  http://forum.llc.ed.ac.uk
- *Quest*, Queen's Belfast…

AN EXPERIMENTAL STUDY OF THE EFFICACY OF TRUST-BUILDING SEALS AND OTHERS DETERMINANTS OF USEFULNESS IN B-LEARNING MANAGEMENT SYSTEMS

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Abstract
An experimental situation was set up in order to analyse how the application of trust-building seals (logotypes of recognised entities and private security certificates) can impact on the perceived usefulness of a blended electronic (b-learning) learning management system, widely introduced in recent years. In terms of the improvement of usefulness, the successful outcome of such Web technologies depends on the specific situation applied and other explanatory factors under the control of the organization that developed them. So, the results of the analysis of covariance emphasize that the more importance attributed to the results obtained by use of a system, the greater will be the perceived usefulness of that system. Furthermore, perceived usefulness could mainly improve for use of logotypes of recognised entities.
Keywords: b-learning content management systems, usefulness, trust, job relevance, trust-generating seals

1. Introduction
"Evaluation", "adoption" and "implementation" are the main states established by the Innovation Diffusion Theory (Prescott and Conger, 1995). Many studies have centred on the adoption state of a technological innovation from the users' viewpoint, obtaining models of intention or theories of behavioural decision, traditionally applied in social psychology (Swanson, 1982; Davis, 1989; Harrison et al., 1997; Pavlou 2002). Researchers therefore seem to have decided that theories of behavioural decision or intention provide a basis for the study of adoption of Information Technologies (IT) (Davis, 1989; Davis et al. 1989; Taylor and Todd, 1995; Bernadette, 1996; Harrison et al., 1997; Karahanna et al., 1999; Malhotra and Galletta, 1999; Venkatesh and Davis, 2000; Moon and Kim, 2001; Koufaris, 2002; Venkatesh, et al., 2003) and electronic commerce (Chen et al., 2002; Pavlou, 2002; 2003; Featherman and Pavlou, 2003; Gefen et al., 2003; Castañeda et al., 2005; 2007; Sánchez and Rondán, 2004; 2005).

Among the models most frequently used to examine adoption of technological innovation are the Theory of Reasoned Action, TRA (Fishbein and Ajzen, 1975; Ajzen and Fishbein, 1980), the Theory of Planned Behaviour, TPB (Ajzen, 1991) and the Technology Acceptance Model, TAM (Davis et al., 1989). Although the first models of Fishbein and Ajzen were designed to explain any human behaviour, they

also contained theoretical principles valid in a wide variety of contexts. The predictive value of TAM and TRA to explain behaviour towards adoption of IT has been consistently significant (e.g., Lucas, 1975; Davis, 1989; Davis et al., 1989; Bernadette, 1996; Harrison et al., 1997).

The usefulness of this kind of model lies in describing the factors conducive to the acceptance of online exchanges, which helps both academics and users to better understand online behaviour in emerging exchange relations (B2B, B2C, A2C,…). There is a lack of research on the acceptance content management systems for e-learning or blended learning (*b-learning*). On the basis of the meta-analyses of TAM by Lee et al. (2003) and King and He (2006), as well as an *ad-hoc* search through the main databases (see Castañeda, Muñoz-Leiva and Luque, 2007), 66 studies were identified focused on Internet user acceptance. Of these, 18% were centred on the acceptance of the Internet as a medium, 45 % on the acceptance of *e-commerce* sites, 12% on e-mail, 8% on other Internet-mediated services and 5% on *free-content* Web sites. Only the remainder (8 %) was centred on *e-learning* systems.

In this environment, considerable research has been done on the acceptance of new IT or information systems but less attention has been paid to the assessment of the factors determining perceived usefulness, despite the fact that this belief has been one of the most important factors in the acceptance of the Web sites (Moon and Kim, 2001; Koufaris, 2002; Chen et al., 2002; Pavlou, 2002; 2003; Koufaris, 2002; Featherman and Pavlou, 2003; Bhattacherjee and Premkumar, 2004; Sánchez and Rondán, 2004; 2005; Castañeda et al., 2005; 2007). This underscores the need for more research in the usefulness of e-learning systems and its determinants.

To this end, a real experimental design provided data enabling an explanation of the perceived usefulness of a Web-based content management system as well as the moderating effects of trust-generating seals (McKnight et al., 1998; McKnight et al., 2002; Yousafzai et al., 2005). Specifically, we focused in the application of logotypes of recognised entities (situational normality) and private security certificates (structural assurance). Equally, the aim is to test the effect on the usefulness of its main determinants, i.e., trust toward the new Web technology and relevance of use for learning tasks. The empirical evidence obtained allows a Web designer or IT specialist to design actions aimed at influencing the acceptance and use of the virtual learning technologies by manipulating controllable external factors, such as the visual characteristics or the structure and contents.

2. Literature review

Perceived usefulness was defined as "the prospective user's subjective probability that using a specific application system will increase his or her job performance within an organizational context" (Davis, 1989, p.985) and has a direct influence on the use of IT in particular. Analysis of the literature on technological innovations shows some of the effects of perceived usefulness. Specifically, this is a multidimensional concept related to increased speed of work, the manner work is done, increased productivity and effectiveness as well as other practical aspects (Featherman and Pavlou, 2003). There is consistent evidence of the relation between attitude and usefulness in research focussed on information systems and computer technology (e.g. Davis et al., 1989; Malhotra and Galletta, 1999) and electronic commerce (e.g., Bhattacherjee 2000; Sánchez and Rondán, 2005).

The Technology Acceptance Model (TAM) also proposes a direct relation between usefulness and behavioural intention (Davis et al., 1989). In organizational contexts, the relation between usefulness and behaviour is based on the idea that people form intentions towards behaviours they believe will improve their work, beyond positive or negative feelings about the behaviour *per se*. This is because perceived usefulness is considered a tool to achieve rewards extrinsic to the content of the work. In this sense, the present study is based on the hypothesis that perceived usefulness will increase intentions to reuse a Web-based content management system supporting learning tasks.

Few studies have focussed on the assessment of the antecedents of usefulness, including trust, relevance of results for job (in our case: learning), quality of results, ease of use, accessibility to information or quality of content (Venkatesh and Davis, 2000; Venkatesh et al., 2003; Pavlou, 2002, 2003; Hu et al., 2003; Chen et al., 2002 Hong et al., 2002). In other words, perceived usefulness is a function of the system's characteristics, such as the high quality results perceived when a Web site offers rich information (Chen et al., 2002). Concretely, the job relevance is a "function of the importance within one's job of the set of tasks the system is capable of supporting" (Venkatesh and Davis, 2000: 191) and is a cognitive judgement distinct from other social influences that exercises a direct effect on perceived usefulness.

Concerning trust shown by people towards something determines the nature of many social and business relations (Fukuyama, 1995; Wrightsman, 1991). Trust refers to "the expectations that other individuals or companies with whom one interacts will not fall into inappropriate conveniences deriving from the dependence one has on them" (Gefen et al., 2003, p.308). Trust is merely a simple transactional decision (specific task) occurring at a single moment (specific time) and consists in an individual's interpretation of responsibility and actual risk given limited information about the reality (Pavlou, 2002).

Moreover, as put forward by Singh and Dalal (1999), individuals consider a Web site to be an additional source of information for promotion of the organization. Internet, and particularly Web pages, can thus be considered advertisements, given their conceptual similarity, physical appearance and function (Singh and Dalal, 1999), so that the concept of attitude towards the advertisement can be equated to attitude towards the Web site (Luna et al., 2002). In view of the foregoing, many models used to examine consumer behaviour towards advertising can also be used for the Internet. Therefore, given the lack of trust that can be generated towards information found on particular Web sites, it may be desirable to sponsor a recognised organization to ratify the (lucrative or not) benefits to be obtained by using a Web site. This could increase the message's credibility and, therefore, improve the trust in assessment of the benefits obtained by the system, thus strengthening purchase intention and behaviour (Parkinson, 1975). Improved consumer trust in a Web innovation can be attained, among other methods, by sponsorship of either public institutions or private independent organisms.

A few authors analysed and demonstrated how the application in Internet of elements such as logotypes of recognised entities and private security certificates –Verisign, BBBOnline, Trust-e,…– (situational normality and structural assurance, respectively) affect the trust toward and acceptance of a Web-site or e-commerce (e. g. McKnight et al., 1998; McKnight et al., 2002; Yousafzai et al., 2005).

3. Research hypotheses

Gefen et al. (2003), Gefen and Straub (2000) and Pavlou (2002 and 2003) include the trust construct in the context of electronic services. Moreover, trust influences transactional behaviour through intentions, attitude and perceived control, as well as indirectly through perceived usefulness and ease of use (Chircu et al., 2001; Pavlou, 2002 and 2003).

According to Gefen (1997), trust is a determinant of perceived usefulness, especially in online contexts, as the consumers' assurance of achieving a certain degree of Web-interface usefulness depends on the people behind the Web site. In some studies, the relatively weak effect of trust on behavioural transaction intentions suggests that it operates indirectly through perceived usefulness and other factors (Pavlou, 2003).

Trust allows the consumer to depend on Web retailers and the underlying infrastructure and so make the interaction more useful. Conversely, if Web retailers are trusted but behave differently to the beliefs instilled, the interface will become useless. The reason is that excessive risk causes the consumer to reject use of the system and, in this case, there is no reason to expect usefulness to be gained with use of the interface (Pavlou, 2002). We can therefore establish the following hypothesis:

H1: Trust has a positive effect on the perceived usefulness of a system.

Venkatesh and Davis (2000) include job relevance as an instrumental cognitive process which, together with quality of result, demonstrability of results and perceived ease of use make up the instrumental cognitive determiners of perceived quality. Quality of result has related aspects included in the concept and specificity of perceived usefulness. The effect of job relevance on usefulness of technology was also examined by Hong et al. (2002) and Hu et al. (2003).

Several authors have linked user acceptance with variables similar to relevance for work, such as the job-determined importance, involvement or task-technology fit (Leonard-Barton and Deschamps, 1988; Hartiwick and Barki, 1994; Goodhue, 1995). In the context of distance learning, the users of the system tends to acquire autonomy in their learning process, which implies the choice of Web support technology, supplementary teaching material, methods of task submission, and so forth. In this sense, it is important to assess the effect of relevance for the results of a new technology. We can therefore establish that:

H2: The importance recognized to the results obtained by use of a system has a positive effect on the perceived usefulness.

In order to increase perceived usefulness, it may be pertinent to include trust-building mechanisms such as logotypes of recognised organizations – in the field of education – (situational normality) and a private security certificate (structural security); analysed by McKnight et al. (1998), Pavlou et al. (2003), McKnight et al., (2004) and Yousafzai et al. (2005). With an effect mediated via trust (e. g. Pavlou, 2002; Gefen et al., 2003), we can expect that:

H3: The presence of logotypes of recognised organizations increases the perceived usefulness of a system.
H4: The presence of security certificates increases the perceived usefulness of a system.
and therefore:
H5: The presence of logotypes of recognised organizations and of security certificates increases the perceived usefulness of a system.

4. Methodology

4.1. Sampling and measurement scales

Information was gathered from 381 undergraduate students from different courses at the Business Faculty of the University of Granada, who were offered a questionnaire structured according to the scales commented here after they had become familiarised with all the options of the WebCiM platform. The elements sampled were selected and assigned by the researcher's judgment, with the aim of obtaining a balanced size (approximately 100 cases per treatment level) for each group. The fieldwork was carried out over the first two weeks of October 2005. Seven questionnaires were discarded because of an excessively high number of missing data and five because of atypical behaviour. The final sample consisted of 369 valid cases (see table 1).

Treatment level	Valid cases (%)
CG: WebCiM[a] platform	**92 (24,93)**
EG1: UGR and Ministry of Education logotypes	**88 (23,84)**
EG2: Security certificates	**88 (23,84)**
EG3: Logotypes and security certificates	**101 (27,37)**
Total	369 (100%)

Table 1. Distribution of sample by treatment applied

A structured questionnaire was used to measure both variables to be explained (usefulness) and trust and job relevance by using the Web-based learning platform. The introduction prior to completing the questionnaire did not refer to the aims of the research, in order to prevent an artificial effect of the treatments on the variables of behaviour and their determinants.

All measurements were carried out on 1 to 7 scales. The usefulness scale of 7 items was adapted to our particular case from Moore and Benbasat (1991), Moon and Kim (2001) and Hu et al. (2003). The 8 item trust scale originated in McKnight et al. (2002), was validated in the context of IT by Castañeda (2005) and adapted to use of a learning support platform for this study. The scale of relevance for work consists of 2 items and is by Venkatesh and Davis (2000). Regarding other variables related to usefulness and job relevance, in this research ease of use had no effect on usefulness, and demonstrability of results was not included in our study, as it was considered a construct that can not be valued by new users of the system.

4.2. Experimental design

A real experimental design was set up in which the stimulus consisted in exposing the student to a fully operative *b-learning* management system or teaching support platform [WebCiM]. This platform was developed by the Department of

Commercialisation and Market Research of the University of Granada. It incorporates several support utilities for student learning. It is available at http://marketing.ugr.es.

Since the aim of the study consists in analysing the effect of the incorporation of logotypes of recognised entities and security certificates on usefulness, trust and job relevance (for the learning tasks) regarding use of the Web platform, three treatment levels were set up (see appendix) plus one control group, CG. The CG consisted in using the platform without any added elements (treatments). The first two levels involved adding to this group the logos of the University of Granada and the Ministry of Education and Science [experimental group 1, EG1] and an imaginary "Secured Version" security certificate [EG2]. The third joint treatment included both the logos for free public access and downloading of material (after prior user identification on the platform), and also the security certificate for access to the student's intranet data management and access to notifications and results [EG3]. The cases were assigned at random to the treatments and the sizes of the EGs and CG were kept balanced (see next section).

Thus, the experimental design proposed was:

$$y_{ij} = \mu + \tau_i + \beta_j (x_{ij} - \mu_x) + \varepsilon_{ij}$$
where,
y_{ij} = *usefulness (dependent variable)*
μ = *general mean of usefulness*
τ_i = *effect of treatment levels (CG, EG1, EG2, EG3)*
X_j = *trust and job relevance (covariables)*
μ_x = *mean of each covariable*
β = *effect of each covariable*
ε_{ij} = *error*

In order to increase the robustness and power of the contrasts to be drawn and also to give the experiment internal validity, the treatments were guaranteed to be carried out in the same conditions. To this end the interviewers were suitably instructed on the operations to be followed and special care was taken that the different stimuli had the same colour, screen definition and speed (see appendix).

5. Results: effectiveness of experimental treatment

An ANCOVA (Analysis of Covariance) was performed, in order to analyse the effectiveness of our experimental design and contrast the hypotheses proposed. In our case, the basic suppositions of Variance Analysis (normality, equality of variances and independence of groups) are respected, except for normality, which is not present according to the Kolmogorov test, although its effect on goodness of fit can be ignored (Luque& Ibáñez, 2000: 285). Furthermore, the number of covariables included in the analysis hold leading rule of Hair et al. (1993: 274).

As regards the explanatory capacity of the models, the determination coefficient (R^2) obtained intermediate values, explaining approximately 60% of the total variance.

Source	Sum of squares (type III)	d.f.	Squared mean	F	Sign.
Model corrected	425,571[a]	5	85,114	103,864	0,000
Intersection	0,538	1	0,538	0,656	0,418
Treatment	18,923	3	6,308	7,697	0,000
Trust	40,889	1	40,889	49,897	0,000
Job relevante	100,165	1	100,165	122,230	0,000
Error	281,900	344	0,819		
Total	7.858,111	350			
Total corrected	707,471	349			

a Calculado con alfa = 0.05
b R-squared = 0.602 (R-squared corrected = 0.596)

Tabla 2. ANCOVA: Test of signification for the inter-subjects effects

Parameter	τ_i/β_j	Typical error	t	Sign.
Intersección	-0,069	0,237	-0,289	0,773
CG	0,000[a]	--	--	--
EG1	0,546	0,139	3,917	0,000
EG2	0,039	0,138	0,282	0,778
EG3	0,413	0,135	3,061	0,002
Trust	0,411	0,058	7,064	0,000
Job relevante	0,498	0,045	11,056	0,000

a. The parameter has been assigned value zero because is redundant. The rest is adjusted by reference.

Tabla 3. ANCOVA: Without standardized coefficients and other results

The result of the *t* test for parameters obtained warns that, for a 1% significance level, perceived usefulness can be explained by the two variables (job relevance and trust) considered its determinants. According to the effects (τ_i/β_j) obtained, any increase in trust, in relevance for learning tasks or in treatment levels implies an increase in perceived usefulness.

Therefore, there is empirical support to confirm the positive effect of job relevance with the use of the Web platform on the perceived usefulness of that platform (hypothesis H2). In addition, with a slightly inferior effect, as trust in the Web site increases, so does the perceived usefulness of that site (H1).

Comparison	difference	significance
CG – EG3	**0.59**	**0.0181**[**]
CG – EG1	**0.50**	**0.0735**[*]
EG2 – EG3	**0.43**	**0.0869**

[**]$p<0.05$; [*]$p<0.10$

Table 4. ANCOVA: Significant difference in post-hoc analysis of perceived usefulness (HSD Tukey test)
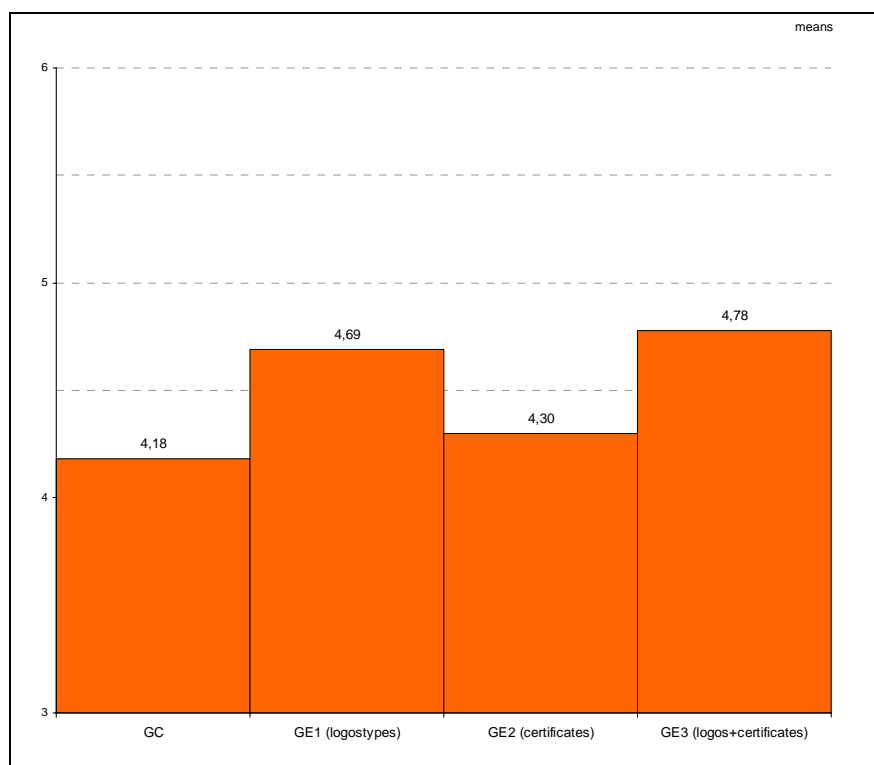

Figure 1: Mean of perceived treatment levels

Different behaviour is observed between treatments (for a 1% significance level), with significant effect of the "logotypes" treatment on perceived usefulness when compared with the CG (see figure 2 and *post-hoc* analysis). So, it is appreciated that the levels "logos" (EG1) and "logos + certificates" (EG3) of the factor have a positive and significant effect on usefulness. This confirms the existence of a positive effect of logos from recognised organizations on perceived usefulness (H3). We also found a significant increase in perceived usefulness in the case of the combined experimental group (logotypes and certificates) (H5), but this effect is due only to the presence of logos.

At the same time, a neutral effect was detected for security certificates (EG2) on perceived usefulness, with no empirical evidence to support hypothesis H4.

5. Conclusions and recommendations

An experimental situation was set up in order to analyse the effect of perceived trust and job relevance, and of associations with trust-building mechanisms (logotypes and security certificates) on the usefulness of Web platforms designed as learning support for university students. The successful acceptance of this type of Web technology depends on the experimental situation and the attributes of the Web platform intervening in the explanation of the usefulness. These attributes can be controlled from the organization developing such platforms.

So, the results of the ANCOVA emphasize the higher importance of job relevance when explaining usefulness. The way to increase a Web site's perceived usefulness should therefore be to find arguments that basically refer to the relevance of the tasks to be undertaken with the system. Likewise, the effect of trust toward the Web platform is significant. This can all help decisively the acceptance of this type of Web innovation because it guarantees that the trust and job relevance perceived for usage of the Web site will not impact negatively on perceived usefulness.

Our experimental design did not allow us to adequately isolate the effect of security certificates and logos from other variables, but we can reach some interesting outcomes. In this way, the perceived usefulness of the new Web-based learning management system improves with the inclusion of logotypes of recognised entities and so we suggest the need to include sponsorship of recognised prestige in the introduction of new Web sites on the WWW or in the development of Web platforms for distance learning or *e-learning*.

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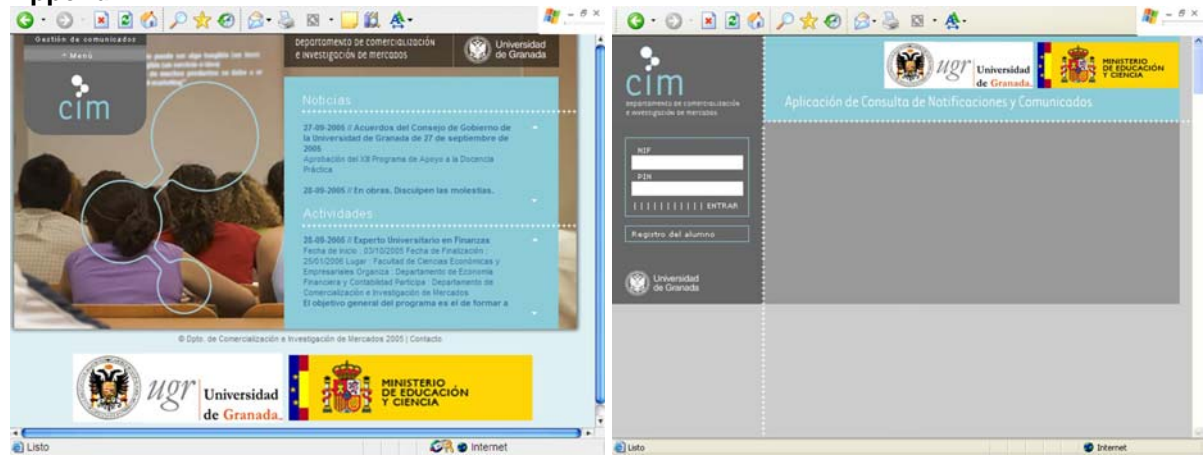
Appendix

Figure 1. WebCiM with logos of the University of Granada and the Ministry of Education and Science
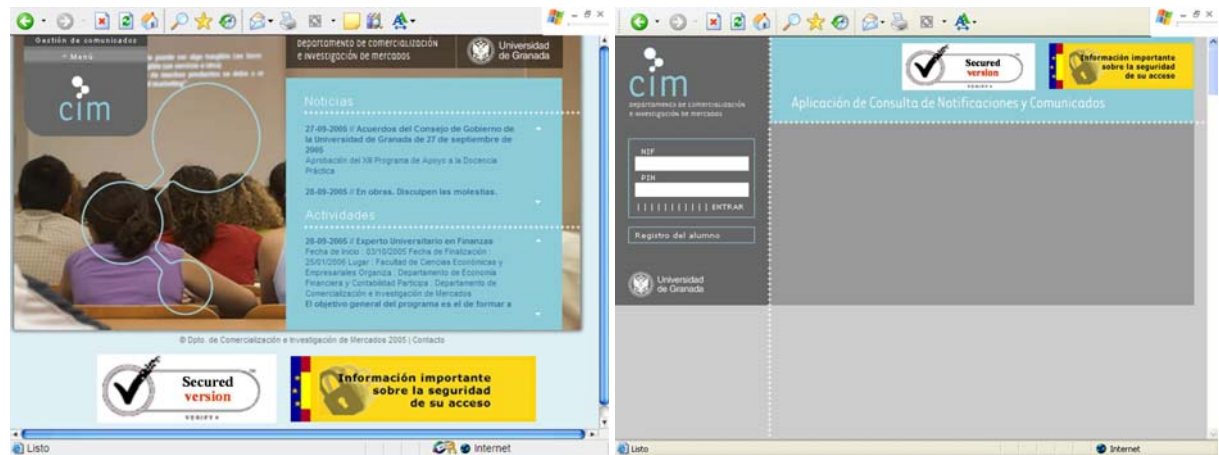

Figure 2. WebCim with security certificates

THE INVESTIGATION OF E-LEARNING IN SCOTTISH LOCAL GOVERNMENT TO DEVELOP SKILLS FOR CONTINUOUS IMPROVEMENT IN PUBLIC SERVICES

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Abstract

E-learning is a fast moving concept which is subject to a number of interpretations. This research paper outlines a research project undertaken to determine the effectiveness of e-learning in Scottish local government and to develop skills in areas where there are training requirements. Twenty-two local authorities, Communities Scotland and Scottish Enterprise participated in a Scottish Executive funded research project. This involved a pilot study of two ten hour modules in project management and partnering which had been previously taught to a similar cohort using traditional teaching methods allowing a comparative study between the learning mediums. The research involved an investigation of the learning experience through means of a delegate workshop which permitted the issues associated with e-learning to be identified and discussed by the e-learners. The output of the research concluded with a number of recommendations to raise awareness and take e-learning forward in Scottish local government.
Keywords: e-learning, local government, interaction, teaching, support

1. What is e-Learning?

E-learning is a fast moving mode of learning concept supported by rapid technological advances. The definition given by CIPD (2002) for e-learning is; 'learning that is delivered, enabled or mediated by electronic technology, for the explicit purpose of training in organisations.' A simple definition is that 'e-learning is Internet-enabled learning' (Gunasekaran et al., 2002). The explanation given for e-learning for this research project was 'the use of the Internet as a media channel for skills development purposes.'

E-learning has been in use for approximately ten years during which considerable knowledge has been gained (Salmon, 2002a), although other literature proclaims that e-learning, in its current form, has only been around for two to three years (Honey, 2001). Training Strategies (2002) suggests that: 'e-learning is about seven years old and like a seven year old child, it is immature, but offers considerable promise.' It is clear from contemporary literature that there is no agreement as to how long e-learning has been in use. Either this, or e-learning is developing at such a fast pace that there are too many different forms of its type of learning, making it confusing to monitor.

The different types of e-learning course range from the basic use of technology that may involve posting lecture notes on a web site, or at the other end of the scale, full

interaction is encouraged through a web-based discussion forum. The pilot course for this research project involved a mixture of the two. Lecture notes were posted on the web and a discussion board allowed delegates to discuss course topics and any issues of concern posted by the course tutors or delegates themselves.

An interesting observation by Pailing (2002) is that the terminology in use for e-learning varies. For instance is it 'elearning, e-learning, E-learning or eLearning' and is it 'online learning, virtual learning or distance learning'? From this, it is evident that even the most recent literature does not have a clear and distinct definition of the e-learning terminology. For the purpose of this paper the author has chosen to use 'e-learning' as the terminology.

2. Introduction

'E-learning provides the equivalent of an Aladdin's cave stacked high with parcels of information and learning objects' (Honey, 2001). This creates a vivid picture of the potential for e-learning. It is regarded as being relatively easy with the necessary resources to create a rich information source available through e-learning although the task is making it effective which requires hard work and consideration. It is important to note that at present there is only a limited research base on how to make e-learning effective (CIPD, 2002) and therefore difficulties are common in constructing an e-learning course that is attractive to the intended market. The familiar slogan associated with e-learning is that it is 'anywhere, anytime, anyplace' learning, where the accessibility of e-learning is regarded as being its greatest advantage (Honey, 2001).

The importance of getting e-learning right at the beginning is crucial as stated by Salmon (2002a): 'it is like any innovation, if we get it wrong at these early stages, our choices are later reduced'. This pilot study aimed to do just this by providing the basis for future developments in e-learning in local government. The six month research project commenced in March 2002 and was completed by September 2002, and conducted to investigate the potential for e-learning in local government. This research developed a simple low cost course delivering around twenty hours of web-based learning content and conducted the research study within a cost budget of £25,000. The learning materials used for the pilot course were initially taught via the traditional learning methods, established from the CoSLA programme 'Developing Skills for Continuous Improvement.' A subjective comparison of delegate learning over an extended period of time on this pilot using material typically delivered over one or two days in a traditional classroom environment indicates that study of web-based material over an extended period is at least as effective and perhaps more so for those who complete the course. However, the fun side of learning with others in a classroom environment is often missing on the web, which greatly detracts from many delegates' learning experiences. The extent to which detraction is a function of personal learning style, degree of interaction with tutors and other delegates, course content, presentation, and topic areas is unclear.

3. Research Methodology

The research comprised of three parallel strands of work with the output of making proposals for taking e-learning forward in local government. Recommendations were derived from four principal areas of the research: these included a feedback workshop conducted once the course was complete; a local authority questionnaire distributed to all Scottish local authorities; a literature review; and the findings from a

previous research project investigating e-learning conducted by Scottish Enterprise. The research involved a number of stages to attain a comprehensive overview of e-learning with the aim of making recommendations to take e-leaning forward in local government.

An initial workshop of local authority personnel was held to determine the status of e-learning in local government with the aim of constructing a questionnaire to be piloted and distributed to all Scottish councils which identified skills gaps and training needs. The other objective of this workshop was to choose two topic areas for the e-learning course, identified as Project Management and Partnering. A 56% success rate was achieved from the questionnaires which gave an adequate picture of the current status of e-learning. Delegates were nominated by their councils to participate in the pilot course.

An e-learning course was constructed using 'Blackboard' as the medium and used course material (project management and partnering learning modules) that had been tried and tested through traditional face-to-face learning. This allowed the course tutors to evaluate the effectiveness of the learning by comparing and contrasting the learning outcomes. Delegate feedback was obtained through a workshop which tested effectiveness and through questionnaires which allowed delegates to air their views more privately.

To ensure a thorough exploration and to investigate the scope of recommendations to take e-learning forward, a desk study was conducted involving a review of the current literature on e-learning and interviews were carried out with those involved in other e-learning initiatives such as Scottish Enterprise, the e-Learning Alliance and the Improvement and Development Agency (IDeA). The literature review highlighted various areas where e-learning could be improved and thus provided an oversight of previous difficulties and success factors for e-learning. The outcome of the feedback workshop was a list of recommendations from the delegates who had experienced a typical e-learning course first-hand and were able to re-count their experience with suggestions for improvement. The questionnaire distributed to Scottish Councils highlighted areas where there are inadequacies that will have to be overcome prior to introducing this type of learning medium. Suggestions have been made from the results of the questionnaire to improve the learning environment to prepare for the possibility of the widespread introduction of this learning medium. The findings from a previous research project provide valuable information that contributes to the research in this project and ensures that related work is taken into account.

The literature review highlighted five areas pertinent to e-learning, these are:
1. The 'course / programme' which incorporates all the necessary attributes, such as the significance of the course content and design for a successful e-learning course or programme.
2. The 'learner' which includes all the elements that have to be taken into consideration in relation to the learner to ensure that the learning medium provided meets learners needs and presents a pleasurable learning experience.
3. The 'learning medium' involving all aspects of this type of learning medium and what has to be taken into account to ensure its success.
4. 'Evaluation' of learning, an important factor to monitor the effectiveness of the learning and to ensure that there is added value, particularly for the employer.
5. The 'organisation' which features all aspects that an organisation must pay due attention to when introducing and continuing with a programme of e-learning.

These areas mirror the findings in the pilot study in terms of significance to local government employees who discussed their learning experience in the feedback workshop.

4. Key Research Findings

The delegate feedback workshop conducted to determine the effectiveness of the course and the learning experience made recommendations relating to e-learning in local government under the headers outlined in Table 1.

Issue Headers	
Opportunities	Technical Support
Future e-learning Network	Learning Support
Infrastructure / Pre-requisites	Course Design
Politics	Learning Agenda
Learning Environment	Getting Started
People Issues	Assessment
Time Issues	Drivers
Cost Issues	Benefits – Employer
Barriers	Benefits – Employee
Threats	Benefits – Customer
Learning Environment	Policy Issues

Table 1: Issue Headers

The initial survey research of Scottish local authorities discovered that there are various skills gaps in local authorities particularly in soft skills areas that underpin various forms of management. Table 2 outlines the skills gaps identified and the percentage of respondents identifying these gaps. Respondents also felt that e-learning could act as a catalyst for tackling these areas and thus established that e-learning is feasible and effective. It was also established that the purpose of e-learning was no different from other forms of learning although it was felt that e-learning should be supplemented by conventional face to face training and development to support soft skills development where personal interaction is most important. It was discovered that these skills gaps have not previously been identified as a priority or acted upon and thus was a useful finding for local government in terms of tailoring any future training.

At the time of the survey (May 2002) only 43% of the councils responding used computer-based learning. All of these are using a CD-ROM based approach focused primarily on basic IT skills development with some knowledge focused learning for example in health and safety or other specific topic areas. Therefore e-learning was a relatively new concept to most of the delegates taking part.

Skills Gap	Respondents	Use of e-Learning
Project Management	66%	✓
Change Management	28%	✓
Performance Management	22%	✓
People Management	22%	✓
Management and Leadership Development	22%	✓

Table 2: Skills Gaps

5. The Learner

It was clear that the benefits of e-learning are influenced by many factors including the learner's preferred learning style, the learning environment (including space and time to learn, ease of access to materials and the suitability of ICT infrastructure within the organisation), and the course content and the facility for interaction. The research found many examples of problems in these areas, and others, which require to be addressed to enable good web-based learning opportunities for local government employees in Scotland. Salmon (2002a) maintains that for e-learning to be successful and a pleasing experience, the learners should have a structured development cycle that meets their needs. This is an interesting proposal as it is important that learners are motivated to participate in e-learning. If it is not tailored to meet their individual needs in the first instance, this makes the whole 'e-learning thing' not very attractive to the people that really matter. There are many other forms of learning which e-learning may complement and vice versa (Honey, 2001). All forms of learning are influenced by the context in which they function, which in turn is dependent upon the learning environment, the learning traditions and the learners themselves (Salmon, 2002a). Honey (2001) speculates that we are 'already spoilt for learning opportunities', meaning that there are many ways in which people can choose to learn.

Consideration of the learners involved in the e-learning programme is vital to e-learning's success. In any type of learning there are four factors which have an impact on the effectiveness of the learning. These are:

1. The climate for learning which involves the organisations culture and systems in place that strengthen the learning.
2. The learner's motivation which may be reliant on extrinsic factors such as reward and better pay or intrinsic factors that include personal ambition.
3. The learner's physical environment is another factor whereby time and space allocated for learning are important in supporting the learning.
4. Learning styles, where due thought has to be given to people's preferences for different modes of learning that may change dependent on the structure of the content and the topic (CIPD, 2002).

Learners have to be motivated to participate in a course where they have control of their own learning. Training Strategies (2002) and Honey (2001) are both of similar views that e-learners require support and encouragement to stimulate motivation to participate in such a learning medium, particularly if they are spending their own time on the course. Honey states that 'learning has always flourished when it has been actively encouraged and supported.' It is evident that people learn in different ways and employers have to understand this to ensure that the learners are prepared to use e-learning as a medium. Training Strategies (2002) claim that by understanding the learners' requirements and individual needs, the learning experience will be made worthwhile. Salmon (2002a) mentions the importance of how the learners 'feel' about learning online, it may be that their preference is not for this type of learning and so the technology available is not of significance to this group.

6. The Learner Environment

Another aspect of e-learning is the location in which learners prefer to undertake the learning. Distractions, time restrictions and lack of space are all difficulties that e-learners may have to overcome depending on their personal circumstances to ensure effective learning. These difficulties were all identified in the pilot project

whereby learners were distracted by other employees who did not recognise that time was being spent 'learning' as well as the distraction of deadlines for other work. Time restrictions involved users being 'timed-out' on the course where connection to the Internet was restricted to half hour slots. A lack of space was identified where it was discovered that there were not adequately equipped training rooms for employees to use. A survey conducted by the 'Campaign for Learning (2000) found that 58% of people prefer to work at their desks and 29% at home (Honey, 2001). Employers should understand that people have different circumstances and should not assume that learners are motivated and have easy access to the resources required (Honey, 2001). A further finding from the Campaign was that 43% of employers felt that they were meeting the learners needs and requirements, but only 7% of the learners agreed. This mismatch between employees and employers in this area will have an impact on the learning experience.

7. Design and Content

'Employees need to learn and apply what they learn in the workplace. If they fail to do so, e-learning will become an expensive mistake' (Training Strategies, 2002). This depicts exactly what is required from e-learning to make it successful in the workplace from an employer's point of view. Thus the consideration to the design and content of the course is of great significance. Employees have to achieve something from e-learning that they can transfer to their role in an organisation that contributes to their own personal satisfaction and gain. This ultimately benefits their employer. In the research project training needs were identified across all Scottish councils prior to selecting courses for the pilot study. Pailing (2002) claims that e-learning has a valuable role to play that include a number of benefits. In the workplace e-learning can add value where there is a requirement 'for training large numbers of geographically-dispersed people, and for reducing time spent on topics such as induction and product training' (Pailing, 2002). Benefits from the implementation of an e-learning programme exist for all stakeholders (Training Strategies, 2002). Pailing (2002) advises that organisations should decide what they want to achieve from using e-learning, 'whether it is to fulfil regulatory obligations, cut down new employees' induction by 50%, or reduce classroom training sessions from two day courses to one day courses.' A further benefit suggested in the pilot study was the opportunity to use the medium for meetings where all participants could log on synchronously, saving both time and money.

One of the biggest and most common dangers associated with e-learning is that it amounts to 'e-reading', where text from books is dispatched onto e-learning (Honey, 2001). This was a key area in the research where there was a degree of disappointment with the course due to the absence of interesting graphics that offered something different to the PowerPoint slides provided. Training Strategies (2002) reiterates this by stating that 'e-learning has got to offer more than merely just text put into an e-learning package. If people want to read, they can go to the library and get a book.' The CIPD (2002) also mention overloading the learner with information as well as communication which threatens the quality of the learning experience. It is apparent that consideration of the e-learning content is very important in ensuring that it offers something different from the forms of learning currently available. Pailing (2002) includes a quote that states 'it's learning with an "e" in front of it' and 'if we spent more time thinking about the second part than we do the first, then maybe we'd realise its potential a lot quicker.' This quote captures the whole e-learning phenomenon. It is another form of delivering learning yet

developers and employers are not thinking about how people learn and what is effective. The combination of different approaches is popular, otherwise known as 'blended' learning. This could be taken one stage further by considering the different learning styles, the learning climate and the learning environment when striking a balance between traditional learning styles and e-learning (CIPD, 2002).

8. Interaction

The ability to interact appeared to be one of the most dominant requirements for e-learning discovered in the feedback workshop. This is supported by Salmon (2001) who agrees that technology can aid new forms of learning, although it is maintained that successful e-learning will only be achieved if there is a degree of human interaction. Delegates placed great importance on interaction with tutors and other learners to prevent isolated working, which was a concern particularly in training rooms that detached learners from fellow employees and supporters. Unless substantial time and expense can be invested in interaction web-based learning is not seen as having any possibility as anything close to as enjoyable as traditional classroom learning. The literature on e-learning seems to be fairly positive in that it is indicated that e-learning can be applied successfully with other methods, and uses terminology to describe this such as, 'complement', 'integrate' or 'blend' with other approaches. The CIPD (2002) speculate that the idea for blended learning is popular because it uses traditional methods as well as utilising the existing technology and so making optimum use of what is available. However, it should be noted that e-learning may be viewed as a threat to other learning methods in terms of providing an alternative to traditional methods. This is suggested by Pailing (2002) who states that e-learning should not be used as a replacement for traditional methods and that it is just an alternative complementary method of doing what has always being done with the aim of learning. Training Strategies (2002) highlight a different angle by suggesting that all methods of learning should be considered possibly resulting in a mixed approach being used to best deliver the learning. This is supported by Salmon (2002a) who states that 'the key to success is a balance between applying useful older concepts about learning and the implementation of innovations using the best of networked technologies.' From another perspective, how people learn in terms of the preferred learning medium is not the only factor that has to be considered but also the opportunities for interaction is a key element of learning whereby participants and tutors have the ability to network with each another (Training Strategies, 2002). Tutor support was a key area identified in the feedback workshop where delegates felt that more interaction and a faster turnaround time in terms of tutor response was required between the learner and tutor to maintain interest in the course. Salmon (2002b) suggests that the use of the latest technology is not comparable to human interaction and states that 'online learners do not wish to do without their human supporters.' A further finding by Salmon is that there is high importance related with e-moderators (an e-moderator is the terminology used by Salmon (2002b) to describe an online facilitator or teacher) in terms of their input and support to the e-learning process. This was evident in the workshop where the learners stressed the importance of tutor support to make e-learning work.

Many attempts at e-learning have been disappointing in terms of adding value and creating 'magic.' It is not just about maximising the use of available technology but of stimulating the learners (Salmon, 2001). Salmon mentions that the 'magic' is created between people and not between the learner and their computer screen. The ability to interact with those in other geographical locations should not be taken for granted

and thus should not be lost to a 'technological waste land' (Salmon, 2001). Honey (2001) acknowledges the benefit that e-learning allows the learner to network with people that may not have been possible without the use of e-learning which in turn permits the sharing of information and experiences. Learners and teachers can interact independent of their location. The research found that the delegates who were geographically dispersed across Scotland were able to benefit from each others responses to topics instigated by the tutor in which a questioning and commenting session was often observed following various prompts made on the discussion board.

Salmon (2002b) believes the future for learning will involve greater interaction and that the social aspect will not disappear regardless of sophisticated technological advancements. From the workshop discussion there is a high probability that interaction will continue in local government which has been identified previously as a critical success factor for e-learning.

9. Learning Support

Good induction briefing was highlighted in the workshop as a requirement for delegates and tutors to allow learners to familiarise themselves with the medium and to ensure that learners and tutors know what is expected of them. The difference between traditional learning methods and e-learning is that the tutor, facilitator, teacher or 'e-moderator' is required to monitor and encourage the discussion with some contribution to input ideas or to keep the learners on track. With this, there is no need for traditional teaching and instead the learners learn from each other. The factors that do not change with this type of learning is the need for a tutor who can understand and respond to the needs of their learners and the requirement for learning materials that motivate and excite the learners (Salmon, 2001).

Also highlighted in the pilot was the requirement of support from senior management and other staff members to encourage a positive attitude and the freedom to study online in the workplace. It was discovered that the development and delivery of web-based learning involves three key disciplines for e-learning to be a success, which are: the tutor who designs and leads the course, the technicians who maintain the web access and deal with technical queries and the software developer who web enables training materials.

Although the e-learning slogan is 'anywhere, anytime, anyplace' learning, this can cause some difficulties for tutors as time is not restricted with a start and finish time as is the case with a traditional lecture. Salmon (2002b) states that e-learning is renowned for 'eating-time.' Thus it is important to specify the time allocated to the course and the participation expected from both the tutors and the e-learners. Related to this factor, is the fact that people are used to the classroom style teacher and may expect a lot of input from the e-learning tutor (Salmon, 2001). Salmon (2002b) suggests that there should be a balance between online and offline activities to allow e-moderators a chance to cope with the workload. This is particularly the case if there are many e-learners and a lot of online discussion.

It is suggested that participants are given an explanation as to what is expected from them for each online activity as well as what input will be given by the tutors. This is why an induction was suggested as a useful idea for all people participating in the course. It is proposed that e-moderators post their 'online office hours' to allow participants to know what to expect from the course. Thus, e-learners and e-tutors

have to be able to understand each others online roles to ensure successful participation (Salmon, 2002b).

10. Tailoring of Courses

The delegates specified that the course should be tailored for the intended learners with specific consideration given to course design and course content. Elements to consider are web-screen design, the balance between online and offline activities, a structured introduction to the course, explanatory notes on developing discussion threads and smaller, more manageable chunks of material. 'e-reading' and an overload of information should be avoided. It was found that small chunks of training material are more suitable than the lengthy modules common in a conventional (one day) training session. Delegates on the pilot often worked in short sessions at their normal workstation totalling perhaps only half to one hour in a day, occasionally up to two or three hours as deadlines for completion of work loomed. The small chunks of material allow learners to deal with one section at a time while coping with daily work pressures. Delegates who preferred longer work sessions typically appeared to work away from their normal workstation and often at home.

It was identified in the research that simple low cost – low tech solutions are not what people expect in e-learning. People expect (more expensive) solutions tailored to a high presentational quality with rapid and easy access. 'E-learning fatigue' was observed in the middle of 2001 where people were no longer getting excited about e-learning and the market was not rapidly growing as expected (Pailing, 2002). This supports the importance of ensuring that e-learning offers something new to the learners to make certain people are motivated and to captivate the market. Some literature suggests that e-learning should provide a 'magic' that cannot be achieved from other forms of learning and other views are that the content is not a major attraction but the ability to access learning online twenty-four hours a day. Thus it is evident that to meet the needs of all learners presents a difficult task.

The learners are not always taken into account, which is surprising considering these are the people that are to benefit from this concept of learning. Honey (2001) states that e-learning developers are too focussed on overloading information to the learners to concern themselves with the learners individual needs. Thus it is suggested that information needs to be tailored to meet the needs of the learners taking into consideration that people have different learning styles and requirements. Some learners are attracted by the technology and interesting content whereas others may view the primary benefit being the accessibility to learning twenty-four hours a day (Salmon, 2001). Salmon also makes a point that learners of this century are prone to doing their own investigations in search for information as they have the resources available to them and can correspond with whom they wish. This provides a good case for e-learning because it has the capability to do just this and is what makes it attractive to those that use it.

11. IT Issues

There are diverse IT issues to be addressed to improve IT infrastructure and Internet access within Scottish councils, that range from security, equipment capability and local authority policy for access to the Internet. It was discovered that there is a tendency for some current IT infrastructure to switch off web access after say ½ an hour or 1 hour of study. This is most frustrating for delegates and contrary to objectives of web-based learning in transferring data and working on a remote server.

In 2001, Training Magazine carried out a survey to determine the use of learning via the Internet within the next three years. The findings from this concluded that 50% of the organisations surveyed would be using this form of learning (Pailing, 2002). Although this was a survey conducted in the USA it highlights the pace of technology and rapid adoption of this type of learning. The CIPD (2002) believe that what makes e-learning exciting is the combination of factors recognised allowing for flexibility and connectivity of the learning experience. Another survey that was conducted on the impact of the Internet over the next twenty years by 70 Nobel Laureates who discovered that 91% believed better educational opportunities will be provided from the Internet (Salmon, 2002c). This finding strongly supports and encourages the view that learning will be greatly supported by the Internet possibly through e-learning as the medium.

The e-learning medium comes hand-in-hand with a number of drawbacks that if not managed prior to the commencement of a programme may have detrimental effects on the learner and the employer. A number of pre-requisites are outlined before e-learning can be evaluated as being effective (Honey, 2001). These include that all learners are IT literate, the technology works and there is consideration given to the fact that there are a number of alternative ways to learn. One of the obvious drawbacks of using e-learning is that it may not appeal to everyone, particularly those that are not comfortable using technology and prefer more traditional learning styles. Salmon (2001) surmises that e-learning should be attractive to all and not just 'modem-sniffers'. Other drawbacks that may have a negative effect on e-learning include frustration with the technology which is a common problem, however Salmon (2002b) states that this is soon forgotten. A lack of social interaction with others in the same place acts as an 'emotional trigger' (Salmon, 2002b). Poor design of the e-learning web screens is another contributory factor which may have a detrimental effect on the learning experience.

12. Raising Awareness

The delegates felt that raising awareness of e-learning by supporting a culture of e-learning would be a step forward. It was suggested that several strands of parallel activity could be involved in moving forward:

- Networking between authorities and other bodies to exchange best practice,
- Developing links with other bodies working on e-learning (for example, Scottish Enterprise (SE), Scottish University for Industry (SUFI), The Improvement and Development Agency (IDeA), and others like the international body working on standards (IMS).
- Developing guidance covering implementation rollout of web-based learning including guidance on home learning and workplace learning.
- Developing guidance on IT issues.
- Developing common mechanisms to provide learners with ongoing feedback on their progress and authorities with feedback on effectiveness of web-based learning programmes.
- Addressing practical policy points in tailoring web-based learning to suit individual authority needs including: e-learning versus CD-ROM, access to equipment/Internet, confidentiality/data issues, development of clear employer policies, and continuing with the pilot learning activity.

13. Conclusions and Recommendations

On the whole the benefits of using e-learning outweigh some of the negativity associated with the medium provided there is proper management of the learning medium and consideration towards the learners. Typical benefits of e-learning are savings in time and cost, accessibility, networking, improved control over learning and a source of rich information. One of the principal benefits for e-learning is that of being open for adaptation.

It is apparent that there are two fundamental pre-requisites for e-learning which are to consider the needs of the end-user – the 'e-learner' – by verifying that the e-learning programme is designed with them in mind to ensure it is effective and meets their individual requirements, and to accommodate a high level of interaction between the 'learner to learner' relationship and the 'learner to tutor' relationship, which was found to be a critical success factor in supporting the e-learning medium.

The research highlighted that there is not one specific e-learning system that can satisfy all entities and an appropriate combination has to be identified to meet the requirements that packages the information for easy digestion. Additionally, it is also important that this is done early on to ensure a cultural match to prevent e-learners losing concentration and motivation to learn.

To conclude, e-learning must offer something new, be applicable to all learners with various learning styles and not just amount to 'e-reading'. It is apparent from the literature and the feedback from the pilot study that developing an e-learning course is challenging where technology is secondary to the design and content.

It is recommended that a small group of delegates from the pilot project work with CoSLA to develop policy guidance and a detailed plan for a web-based learning programme for Scottish local authorities. This guidance and plan could set out proposals with targets in a consultation draft, which explores how local authorities might address the recommendations and related topics outside the scope of the research, such as the interface with the wider e-government agenda and core decisions which CoSLA may address. Further work is required to interpret the significance of the recommendations in the context of local government and to develop guidance for their implementation.

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RELUCTANT TEACHERS AND TRADITIONAL LEARNING METHODS: THE MULTIMEDIA TEACHING AS A CROSSROADS BETWEEN THE OLD AND THE NEW

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Abstract
This paper presents the first results of the Multimedia Teaching Project, a training course for elderly teachers in primary and secondary schools, designed to provide the teachers with the hardware, software, and training necessary for them to conduct multimedia classroom projects. Key areas of the training were:

- *Integrating curriculum content into multimedia production*
- *Developing multimedia projects in the classroom*
- *Evaluating multimedia projects*
- *Producing professional multimedia*

The purpose of the training was to engage teachers in a process of learning about technology and exploring how it might be used in the classroom, focusing on ways in which technology allows teachers to do that which they were never able to do before, such as instantaneous worldwide communication, simulations and hypermedia presentations. The main challenges and questions to answer were: is the traditional text still adequate? How can the process of knowledge acquisition be more effective? And, above all, how can we overcome teachers' resistance to technology?

Keywords: Multimedia education, new technologies, resistance to change, adult education, interactive learning

1. Introduction

The paper presents the first results of the **Multimedia Teaching Project**, a training course for elderly teachers in primary and secondary schools, designed to provide them with the hardware, software, and training necessary for them to conduct multimedia classroom projects. The implementation occurred in a specific context related to the local schools communities (a small village near Agrigento, in Sicily), where there are few opportunities to buy an advanced classroom technology, and teachers' motivation to learn technological issues is sometimes quite limited.

As classroom teaching methods are often "heavily teacher centred" the project attempted to ameliorate and improve teaching methodologies, and overcome resistance to computers in school, which sometimes arises from the awareness of the drastic changes they will bring about.

The lessons plans focused intensely on training the teachers to integrate the Internet into their curriculum and create online lesson activities through supportive technologies, helping them to understand that new learning and teaching models (multimedia lab, reading and manipulating text, playing didactical games, listening to

music, on line classroom newspapers, creation of the school web site) are not a contrast between the real and the virtual.

2. New technologies and multimedia revolution

Innovation and knowledge are becoming ever more decisive factors in determining the capacity of Europe to be competitive and achieve economic success and social stability. New technologies are transforming the ways in which knowledge is created, exploited, transferred and shared: moreover they allow educators to include multiple media into the teaching materials, improve the quality of education, encourage and enhance peer learning as well as individual creativity and innovation.

The revolution in computers and telecommunications networks, along with the global explosion in knowledge and ready access to powerful communications tools, are creating unprecedented changes in business, commerce, government, science, health care, and education. New jobs, new industries, new modes in community building, increased learning opportunities, are all the consequences of this revolution in network and information technology.

Computers are constantly redefining the way we live and work. The computer age means classrooms will never be the same again. Computers are already introducing and even forcing new developments in the way students are taught and learn. Using computers, students are able to view material customized for their class with the added advantage of interactivity. Education and training must adapt to these new and far-reaching challenges, and join forces in a newly integrated approach to meet the needs of the knowledge-based society. The term "multimedia" generally is associated with computers and videos, but it simply refers to a project created using more than one expressive medium form. "Multimedia" describes a number of diverse technologies that allow visual and audio media to be combined in new ways for the purpose of communicating.

With the introduction of the personal computer, the tools of multimedia have been put into many more people's hands. Many simple, intuitive and inexpensive software programs are now available that allow even children to combine words, pictures, sounds, animation and video into much more persuasive, powerful and empowering communications vehicles. With Internet becoming so pervasive, they can now publish and share their work with millions of people around the world.

New technologies do not replace traditional media: they simply provide more options. With "Interactive Multimedia" in education we recognise that:

1. It is not one thing.
2. It is a combination of hardware, software, and storage technologies, incorporated to provide a multisensory experience.
3. It engages the student as an active partner, not a spectator.

Students can use a variety of input devices to "talk" to or interact with the computer, such as a joystick, keyboard, touch screen, mouse, trackball, microphone, etc. Many media sources can be used to contribute components to the multimedia product, such as a videodisk, CDROM, videotape, scanner, CD or other audio source, camcorder, digital camera, etc. Media may also refer to the medium used to store the interactive multimedia product, such as a videodisk or CDROM.

The advent of easy-to-use multimedia authoring and graphing packages and the ease with which educational materials can be put on the Web, have all created an environment in which traditional classroom teaching can be transformed and made more exciting for students and teachers.

2.1   Advantages of multimedia in education
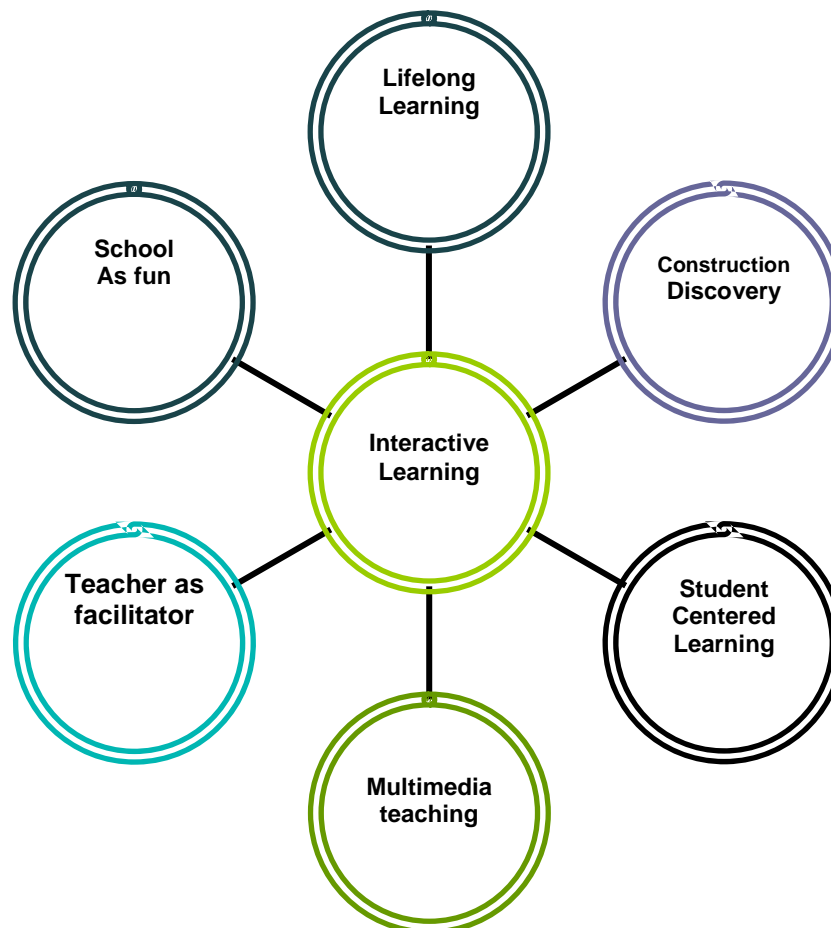
Some significant advantages of using multimedia for learning include:

1. Multimedia enhances the text presentations by adding sounds and compelling visuals.
2. Students are more attentive to multimedia messages than traditional teaching methods (traditional text, student as a passive learner, etc.)
3. Students are more interested in multimedia messages which combine the elements of text, audio, graphics and video. Communication research has shown that the combination of communication modes (oral and visual) offers greater understanding of information.
4. Multimedia is entertaining as well as educational, and there are less discipline problems when students are using computers.
5. Multimedia can be considered as a means for the individualisation of learning
6. Multimedia skills give students a big help in communicating their ideas: drawing, graphics and image editing, animation, photography, videos and presentations, and using the Internet and the Web.

7. Traditional classroom teaching can be transformed and made more exciting for students and lecturers, improving student performance, motivation, besides collaboration and communication skills.
8. Multimedia technologies are necessary to enable students to become actors in the information society.
9. Appropriately used, technology can be used to perpetuate old models of teaching and learning. Teachers can use multimedia technology to give stimulating lectures, helping them to create a creative community of learners.

A multimedia learning environment involves a number of components or elements in order to enable learning to take place. Hardware and software are only part of the requirement. But, a key role is represented by teachers. Teacher should play a central role in coaching the students, assuming an interchangeable function: learner in the classroom; collaborator with students, moderator, tutor, etc. Are they ready to become the leaders of this technological revolution?

3. Critical elements: reluctant teachers

One of the biggest obstacles to the implementation of technology in education isn't a lack of hardware, but rather the fact that many teachers aren't ready to use computers in the classroom. Many teachers have trouble acclimating themselves to computer equipment : when new computers are unpacked and set up in the classroom or in the multimedia laboratory, many teachers feel threatened, afraid, or just "reluctants" toward them. Who is the Reluctant teacher? The Reluctant teacher is one who has not yet incorporated the use of technology into his daily classroom activities. What are the reasons for this reluctance**?**

- Age and lack of time
- Lack of competences
- No patience for unproven technologies
- Lack of resources, fear of the unknown

These were just some of the comments made by the teachers (from primary and secondary schools) who were "obliged" by their headmaster to attend the training course "Multimedia teaching":

– *"I've been teaching for 25 years. Why change now?"*
– *"Nobody can force me to use the computer"*
– *"I don't' think there can be anything that the computer can teach, that I can't teach without it"*
– *"I am too old!"*

There were some fears among teachers concerning the use of new technologies in the educational process: Will children lose their ability to relate to other human beings? Will they become dependent on technology to learn?

Another critical element was for teachers to be familiar with multimedia technologies in order for them to know how to use them within their curriculum areas.
Teachers were sometimes reluctant to use new technologies, for various reasons, expressed in a questionnaire filled out before the course:

- They felt that technology was a wonderful thing, but they did not have time to use it.

- They felt that the students knew much more than they did when it comes to technology but that they were unprepared to make effective use of new technologies in their classroom.
- They were also conscious of their lack of competencies: the implementation of multimedia tools requires persuasion, learning by experience, and highly personalized *learning journeys.*

Technology can help teachers make the transition from broadcast learning to interactive learning: Don Tapscott, in his famous bestseller, *Growing up digital: The Rise of the Net Generation,* says that "*People who oppose computers in the school are like doctors who oppose the use of modern medicine".*

These days, 90% of schools are connected—the issue is no longer access; it's how to successfully integrate the technology of new media into the classroom, and teachers are struggling. Most teachers were convinced that the Internet is an important tool for their classroom. Despite this, teachers reported that they were not getting the most out of their Internet access. However, schools have been – especially in local communities – slow to embrace these new technologies with the related culture of change and opportunities they represent. Most teachers are skilled, motivated professionals who are dedicated to educating their students; however, a whole generation of teachers need to learn to use the new tools. They realize that they must change but they require a sort of proof of results before they buy (expecting a big difference in outcomes and performances, having little tolerance for change); they are conservative, having no patience for unproven technologies. In the training course provided only 5% of teachers reported feeling very well prepared to integrate educational technology into classroom instructions.

3.1 How to deal with the reluctant teachers: theory and practice
How can we build teachers support and enthusiasm for technology and technology training? Here are some field-tested strategies.

- Set the stage - explain why the students are using the technologies and processes
- Provide coaching - help others gain skills by tutoring
- Get continual feedback - helps the teacher keep track of what's going on in the classroom and allows for necessary adjustments
- Patience - learning always emerges slowly initially.
- Don't expect too much - not all students (and teachers…) will adjust to this method.

One must remember that with the elimination of traditional teaching methods, the teacher can disengage another set of students. Maintaining a variety of teaching approaches when dealing with a classroom of students, best addresses the needs and styles of today's diverse classrooms, and it is up to the educator to ensure that these various methods are optimally combined.

It is important for the reluctant teacher to know that they are not alone. Meetings and tutoring should be done as a group. These teachers need to see that there are other staff that have not jumped on the "technology train" yet. They need to know that there are colleagues at their same level. They will need to know who they can ask "dumb" questions from without fear of being looked down upon.

Some teachers will be interested in participating in training if there is some tangible item that they receive for their efforts. Typically this would be in the form of a desktop

or laptop computer given to them upon completion of a planned technology course. Having the equipment to continue practicing and learning with is very important. Another possibility would be additional budget money for their program so that they can purchase goods that they need for their classroom: this might be items such as free software, midi equipment for the music classes, or touch sensitive graphics tablets for the art classes, etc.

In order for a reluctant teacher to buy-in to learning technology they need to have some positive proof that:

- **They will be able to learn it**
Personal examples from other teachers who have recently mastered technology will help. Time to observe in technology using classrooms would be beneficial. Starting the direct instruction classes slowly and simply so that the learner has some beginning positive experiences will also help insure to them that the old dog is going to be able to learn a new trick or two.
- **It will benefit them**
This will be the most helpful item in getting reluctant teachers into using technology in their classrooms. Proof must be shown to them that they will soon be using the technology for their personal lives. The appeal of being able to quickly and inexpensively communicate with family and friends is universal.
- **It will benefit their students**
Proof needs to be shown to them that the technology will benefit their students so much more than paper and pencil that it is worth the time sacrifice to learn. Careful selection of classes, projects, and webpages must be made so that the reluctant teacher is impressed with the student learning involved and not overwhelmed by the details of how to make it work.

Moreover, they need constant support and assistance, which should be planned for:

1. **The beginning phase**
During the beginning phase the assistance will be in the form of someone who the learner can ask beginning questions of. Learners are so busy taking in instruction during the class that they won't think of things to ask until later when they are mulling it over in their heads. Someone needs to be easily available to answer their questions, encourage their accomplishments, and help lead them into the desire to learn the next topic.
2. **The practicing phase**
During the practicing phase a trainer/tutor needs to be available to make sure that the learner is not picking up bad habits or techniques. The trainer can be one who is available to receive e-mail, critique presentations and webpages, and assist with design of lessons, offering the learner valuable feedback before the learner is ready to go public.
3. **The incorporating phase**
Assistance during this phase is critical. The trainer must work as an aide in the classroom when the teacher is first introducing the technology to the students. Failure at this stage would be devastating. The trainer can watch for possible problems, work with some of the students so there is less of a load, and offer alternatives when something does go wrong.

Reluctant and resistant teachers will continue to be encouraged to incorporate technology into their lives and classrooms if they have some resources to refer to during times of questioning and doubt. Some pointers on curriculum content and instruction methods:

Curriculum Content
- Using a multimedia project: digital materials and learning goals

- Search the Internet. How? Access an Internet database. Why?
- A self-correcting quiz or test – "QuizFaber"
- Test reading and comprehension skills.
- Interact with statistical or graphical data.
- Animation. Play a computer game.
- Create a simple school web site
- Discovering free educational software on the web
- Be able to use a package of Multimedia tools: Images Processing, Video Editing,
- Sound Editing, Macromedia Flash

Instruction Methods

- Lectures
- Group discussions
- Hands-on exercises
- Workshop

3.2 Still reluctants?

Before the training this study found that**:**

- Teacher was the only source of information: "teacher talk."
- Teacher served as a role model
- Teacher was the primary resource to meet individual learning needs.
- Books provided more role models and multiple perspectives.
- All the teachers had a little tolerance for change
- They were very conservative and they expected a big difference in outcomes and performances

After the training, some comments and results:

- " *We learnt more about the topic as well as the software; we also developed a positive group attitude"*
- *"We learnt how to deal with multimedia, developing a CD-ROM, software, navigation and interactivity"*
- *"Now we are better able to present our concepts using digital multimedia"*

Teachers reported that they started to use a new type of critical thinking to evaluate visual information such as advertising and photojournalism.

Teachers could select print, photo, video or some combination to best teach content, enhancing visual and verbal content during their lessons.

From all the interviews we did with the teachers after the training, we found that the majority of them were very motivated and found working on their new multimedia projects very inspiring and challenging. Many of them enjoyed exercising their creativity and multimedia skills in visually representing their content material. They also admitted that they were able to learn more about their "subjects" as well as creating multimedia presentations, and able to design an interactive multimedia applications with active links.

Moreover, after two months, all the teachers involved in the training, were able to conclude that by integrating multimedia into the teaching and learning process, the conventional curriculum models are reinforced and strengthened. The multimedia project developed during the course enabled the teachers to exercise their creative and critical thinking skills and – this can be considered one of the most important aspects – to assist the students in the construction of their knowledge.

4.0 Conclusions and Recommendations

In conclusion, Multimedia, if exploited intelligently and efficiently, is a great occasion for change in schools. The first important step is to stop thinking in terms of a simplistic contrast between the real and the virtual. The virtual should be seen as an amplification of the possibilities of interpreting the real, focusing on the fact that the relationship which is built up between the computer and the user is synonymous with the physicality present in the digital world. The introduction of the Internet in schools also implies changes in current teaching practices; it does not mean free "netsurfing" for hours, but it does represent an inexhaustible source of research material. Teachers should be encouraged to identify the computer applications they need in their own classrooms, to attend outside workshops and seminars, and provide them with consultation and support to integrate specific computer applications into their daily lessons. After receiving this kind of technical support several times, teachers will naturally begin to experiment, solving problems on their own by using the resources available to them through the computer's help files and manuals. Once teachers develop the confidence to troubleshoot independently - even if they are unsuccessful at first - they will never again be satisfied to use computers at only a passive and rudimentary level. In this way, all students could receive the instruction in technology that they deserve, and teachers could finally conquer the digital generation gap.

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[For the description and goals of "*Multimedia teaching project*" (2007), please consult the website **www.smgalilei.it**]

INTEGRATING SOCIAL SOFTWARE IN AN ONLINE E-LEARNING COURSE FOR TEACHERS

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Abstract

We describe the implementation of a wide array of social software tools to support an online course about the didactical and technological aspects of e-learning. By using the social software tools, we offer the learners, coaches and instructional designers the necessary instruments to form an active and enthusiastic community of e-learning professionals. The e-course consists of an intensive eight-week period of reading, collaborating, communicating and experimenting, and the main focus of the course lies in the sharing and reviewing of interesting practices with regards to e-learning in higher and adult education. The learners use a variety of communication, information and evaluation tools for reaching the course objectives, for example discussion boards to share experiences, wiki's for collaborative writing or personal reflection or videoconferencing tools to talk with each other or the coaches. The course is highly structured: the learners follow a prescribed path through the content and have to participate in weekly assignments or reflection postings. We briefly explore whether our array of social software tools can be used in the future for a so-called personal learning environment (PLE) to accommodate more informal learning paths by the participants but remain sceptical to the implementation of such a PLE in our course concept, based on the learner evaluations.

1. INTRODUCTION

This article explores how information and communication technologies that facilitate the collaboration, exchanging and sharing of ideas help teachers to create new networks where knowledge is actively shared and distributed. The main question is whether the use of social software in in-service teacher education leads to better learning or teaching, reflecting the major tension described by Mejias (2005):

> *"Innovations in educational technology are often seen as opportunities to transform learning, and social software (blogs, wikis, social bookmarking, etc.) is no exception. But are the tensions between pedagogies and social software the result of attempts to make the latter conform to traditional teaching practices, or are they signs of real opportunities for rethinking learning processes?"*

Indeed, the implementation of technologies in the classroom has not always had the effect that educators or (even more so) governments wished for. The adoption of technologically-enhanced learning occurs at a pace and in a manner which is maybe typical for a slowly adapting educational world, but less so for a rapidly changing society (Walllis and Steptoe, 2006). Next to these changing contexts which put strain on our educational practices, the so called *Net Generation* is appearing in our universities (Oblinger and Oblinger, 2005). This net generation has a fundamentally different attitude towards technology (Frand, 2000) and values connectivity and communication over passive reading or writing. Social contexts and contacts become more important and the interactive social technologies used by the Net Generation reflect this wish. They value people, not technology a priori (Green and Hannon, 2007). It is no mystery that the educational world they encounter at our universities often seems cold and impersonal - with focus and emphasis on theory and contemplation, while the technologies used in conventional learning contexts reflect this atmosphere. Downloading of PowerPoint files, on-screen reading of course material or participating in boring bulletin boards is ubiquitous. The use

of technology to support the teaching and learning process (e-learning) is not obvious for many teachers. They have never experienced these technologies themselves from the viewpoint of a learner and have difficulty in imagining applications or the added value. Indeed, the added didactical value should be the focus, rather than the use of technology.

It is not easy to provide good in-service teacher training courses which focus on these problems. A short course can never provide enough information or hands-on practice, but, more importantly, also does not provide the teachers with the time to discuss relevant interesting practices or reflect on their own professional functioning. Following the motto *'Teach what you preach'*, we implemented an intensive online course about the technological and didactical aspects of e-learning. By giving the teachers enough time to reflect and share experiences and by embedding a wide variety of novel and innovative tools, we ensure that they experience first-hand the added value but also the disadvantages and problems. The course has been operational since 2004 and in this article we reflect on the most recent changes the instructional designers made to the course. These recent changes consist of the use of more social software tools.

1. THE ELISE-COURSE AND ITS SOCIAL SOFTWARE DIMENSION

1.1 The ELISE course concept

From 2002 to 2006, a number of Flemish institutes for higher education participated in a European MINERVA project investigating the use of innovative technologies for in-service teacher training. The project was coordinated by the Catholic University of Leuven (Vliebergh-Senciecentrum). One of the products of this ELISE project (E-Learning for In-Service teacher training in Europe) was a web-based course about e-learning (Cannaerts et al., 2005; Cannaerts and Wambeke, 2006; Cannaerts, 2007). More than 200 Flemish teachers in higher education and vocational training participated successfully in the course - the sixth run takes place in spring 2007. The course usually runs twice each year and focuses on didactical aspects of e-learning practices in higher and adult education. The learners are divided into small groups: a typical learning group consists of 15 participants who are coached by two e-coaches. The learners move synchronously throughout the course, which is highly structured and consists of seven modules (one module each week) with seven assignments. We estimate the workload of the learners to be between 3 to 4 hours each week. Depending on how intensively they participate in the weekly discussion boards (where the main learning activities take place), this may increase up to 6 to 8 hours.

1.2 Technological tools used in the online course

The ELISE course makes intensive use of various software platforms. The implementation of this wide variety of tools reflects a conscious choice by the course developers and e-coaches: First of all, not one single software platform (Virtual Learning Environment or VLE) can provide all the necessary tools for an innovative distance education course, just as no single classroom setting is optimal for all different courses, contexts or learners. By complementing our VLE with different tools, we provide a much richer learning environment for the learners. Not only text-based content is offered, but also video material and extensive communication or collaboration instruments. A second reason for implementing a wide variety of different learning tools, is confronting the learners with many different software instruments they themselves may find usable for their own classroom practice. This reflects the 'learning by doing' philosophy of the ELISE e-course.
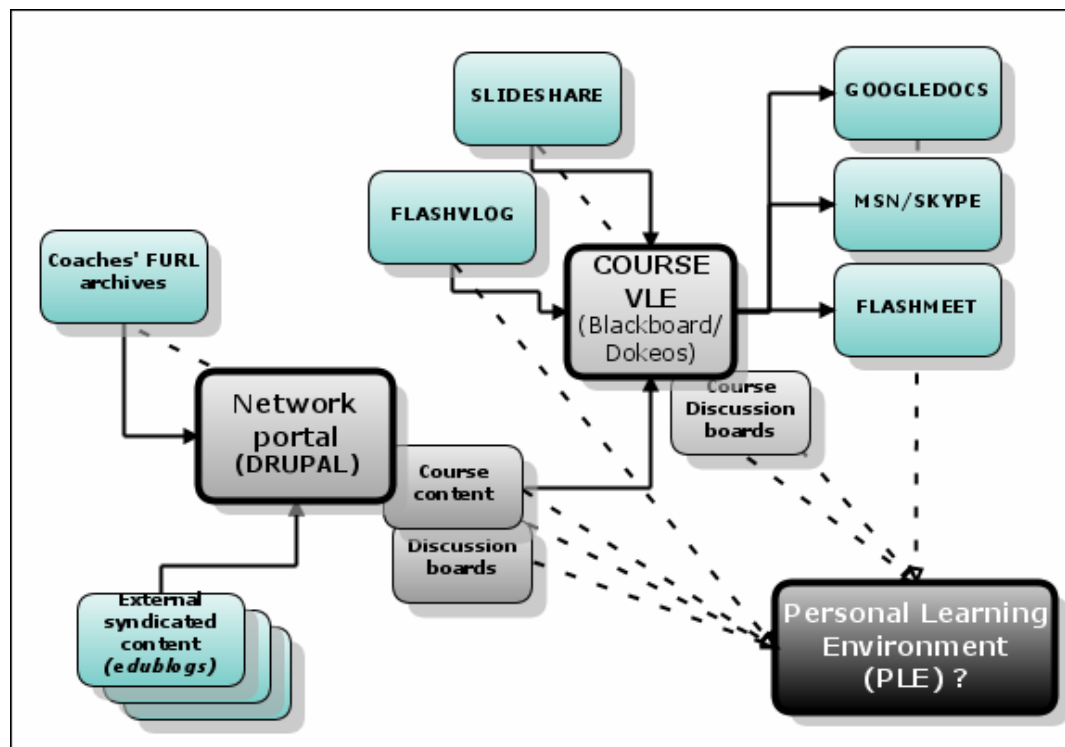
Figure 1: *Schematic representation of the used social software tools and their link with the Virtual Learning Environment (VLE), network portal and proposed Personal Learning Environment (PLE).*

The various tools, illustrated in figure 1, can be divided into three different groups of instruments: information, communication and evaluation tools. These various instruments can be considered as 'small pieces loosely joined'. This metaphor was introduced by Weinberger (2002) (http://www.smallpieces.com), which reflects the new learning 2.0 architecture. These small applications are not that tightly integrated as they would be in a standard monolithic package (e.g. Blackboard, WebCT...). The way these applications are joined is mostly by automatic syndication methods to the main course instrument (VLE, which is Blackboard (http://www.blackboard.com) or Dokeos (http://www.dokeos.com/), dependent on the learner's choice) and to the Network Portal for the ELISE community (for which we use DRUPAL (http://drupal.org/)). The VLE aggregates all directly relevant course information and links, the network portal aggregates all other aspects such as the registration and course information pages or the networking instruments for alumni or coaches.

a) Information tools
The course content is developed and adapted on a DRUPAL server, making it easy to syndicate or embed the learning materials in other sites or VLEs. Making the content independent on the used VLE makes it easier to implement the same course materials in different contexts or VLE's. The DRUPAL environment makes it also easier to collaboratively write and edit the content. Part of the content is also provided using more visual methods in order to accommodate various learning styles. The visual methods are, e.g., mind-maps or video fragments. The "Flashvlog" tool (http://www.flashvlog.com/) makes it remarkably easy to record and disseminate short movies from an e-coach. The "Slideshare" (http://www.slideshare.net) social software tool enables the sharing, reviewing, commenting or syndicating of

presentation files. Both of these instruments will be implemented by February 2007. Finally, external information sources such as interesting hyperlinks from the coaches' internet-archives (the social software tool FURL (http://www.furl.net) is used for this) are syndicated to the DRUPAL network portal.

b) Communication tools

The main focus of the course is not based on the dissemination of content to the learners but on the support of learning groups which share good practices and collaboratively gain experience with e-learning tools. The aspect of 'communication' is therefore of the utmost importance in the ELISE course, which is reflected by the wide variety of communication tools we implemented. The learners and coaches write extensively on the course discussion boards. The weekly assignments are primarily debated on these boards, which means that typically more than 100 messages are posted on the boards each week (in a learner group of 15+2). When learners have to collaboratively write assignments, they use the "Google Documents" tool (http://docs.google.com), which can be easily published to a larger audience in a wide variety of formats. Direct personal learner-to-coach interaction is supported by using MSN Messenger or SKYPE (http://messenger.msn.com or http://www.skype.com), or sometimes by regular telephone (in case of technical problems or emergencies). Finally, we use the FLASHMEETING (http://www.flashmeeting.com) videoconferencing tool for regular synchronous meetings of the learners or coaches. Almost all learners and coaches agree that the use of synchronous communication tools, especially tools such as Flashmeeting (which is easy to implement and use), can provide motivation-boosts in the distance course and may ensure the cohesion of the community.

c) Evaluation tools

In order to measure whether participants achieve the learning objectives, the evaluation dimension plays an important role in the instructional cycle of a course. The general formulation of the learning objectives for the ELISE course can be summarised as follows. After obtaining the ELISE course certificate, a teacher:

- is confident in using a wide variety of web-based tools, such as discussion boards, virtual learning environments or videoconferencing tools;
- can choose which technological tool fits with his/her educational needs;
- is able to see the added didactical value of several e-learning tools.

Furthermore, the individual participant can set his/her own goals, which may be very practical (such as *'I want to implement an online quiz for my students'*) or very general (such as *'I want to investigate which LMS my school should implement'*).
We rely on three different evaluation methods, using the instruments which were already mentioned above:

- Self evaluation: The participant shares a collaborative document (Google Documents) with his e-coaches where he/she can write down his or her personal learning objectives in a personal development plan. The participant needs to formulate his goals SMART and indicates how he or she is going to achieve these goals.
- Peer evaluation: The participants have the possibility to rate the different contributions of their fellow learners in the used discussion board. We have experienced, however, that the learners are rather reluctant to 'grade' their peers, and often find it easier to

give written feedback in the discussion boards instead of rating their peers' contribution(s).

- General (course) evaluation: after the third module there is a synchronous communication session (using Flashmeeting) in order to let the participants share their course problems or experiences. The e-coaches moderate a discussion towards a strength-weakness analysis of the course. This in between evaluation makes it possible to optimize the individual learning routes of the participants and the course in general as well. At the end of the course there is a general online questionnaire on the course.

2. FROM THE VIRTUAL LEARNING ENVIRONMENT TO A PERSONAL LEARNING ENVIRONMENT?

Recently, the term 'Personal Learning Environment' (PLE) has gained popularity (see, e.g. Attwell, 2007). This term does not refer to a certain software platform of specific technological tool, rather than to a novel way to look at Communities of Practice and lifelong learning, based on collaborating and sharing of ideas or practices in a much more informal and just-in-time context. As e-learning expert Downes (2005) writes:

> "*It becomes not an institutional or corporate application but a personal learning center, where content is reused and remixed according to the student's own needs and interests. It becomes, indeed, not a single application, but a collection of interoperating applications—an environment rather than a system.*"

Such a PLE could be easily imagined in the Web 2.0 framework of 'small pieces loosely joined' (Weinberger, 2002), meaning that a learner would gather relevant information from a wide variety of (open) information or collaboration platforms, such as wikis, blogs, discussion boards, google searches... By using RSS technologies, the implementation of such a user-specific environment is becoming more and more straightforward. Also for in-service teacher training and - even more so - teacher support, a Personal Learning Center or Environment would be very useful. Teachers could aggregate all relevant information about the topics they are interested in, whether they come from 'official' sources (such as government publications) or from informal ones (such as different Communities of Practice they visit).

In the ELISE network, we have also experimented with more informal methods of community building and sharing of experiences using the instruments described, but we have experienced that the learners are rather reluctant to leave the 'prescribed learning path', and that the sharing of experiences is much more obvious in a more formal setting. By forcing the learners' learning path in a prescribed and strongly scripted format (e.g. strict deadlines for fixed assignments and feedback posts, strict guidelines as to which tools when to use...), we partly lose the flexibility but ensure that the small learner groups have intensive discussions and form Communities of Practice during the fixed course time. Attempts to keep the communities active after the course ends have not been successful: the groups are too small and too diverse for this. Attempts to offer more flexible approaches (e.g. specialised modules or additional focus groups on specific topics) have also not been very successful and resulted in learner confusion and an increased drop-out rate.

In conclusion, while the ELISE coaches and instructional designers value the idea of an informal learning context (based on a PLE), the scripted formal format of the course is deliberately kept in all ELISE course offerings. We strongly believe that the formal and strict learning path of the ELISE course is one of the main reasons for

the very high retention rate (about 85% of the learners complete the course and obtain a certificate) and high learner evaluation scores. We also believe that the PLE, while technologically feasible, is not yet a reliable instrument for the average teacher. While syndicated content from dozens (even hundreds) of sources can be aggregated in a newsreader, for example, we witnessed several problems with this method:

First of all, such an abundance of aggregated information makes it much more complex to get a quick overview of what's happening in the community. Important messages (for example, from the course or coaches' blog) may be blurred by background clutter from less important sources. This is inherent to the learner-centered view of the PLE: the instructional designer or coach is one of the many information sources but this can lead to confusion. Learners, however, find it often useful to have a much more guided path through the various sources of information (Kirschner et al., 2006). Self-directed learners or community members clearly need above average information competencies. Furthermore, not all information sources provide their content in a usable syndicatable format. For example regular VLE's, where still much of the (formal) learning takes place, are often shielded making it very difficult (or even impossible) to syndicate their content to a PLE. This means the PLE may lack a crucial part of information for the learning of a teacher. Finally, Personal Learning Environments are in their infancy with regards to standardization or technological user-friendliness. The use of RSS, for example, is not yet obvious for a non-expert teacher. This problem will undoubtedly be solved as more intuitive and routine software packages (such as e-mail clients or web browsers) are improved for mainstream use.

3. LEARNER EVALUATION AND EXPERIENCES

During the Spring 2006 run of the ELISE e-course, 43 learners filled out a detailed questionnaire investigating their experiences and evaluating the various tools. The questionnaire asked the participants to reflect on a number of statements on a scale from 1 (totally disagree) to 5 (totally agree). There was also ample room for free text evaluation. The general course evaluation was excellent (an average score of 3.9 out of 5), supporting our claim that our e-course provides a good answer to a clear need for in-service teacher training about online learning.

As to the use of the various software instruments (discussion board, online content, videoconferencing, collaborative writing tools...), the learners clearly agree that these instruments provide them with enough learning diversity (average score 4.1 out of 5). They value the use of a wide variety of tools, ensuring that they themselves may make adequate choices in their own teaching situations. This is illustrated in the following learner statement (translated from Dutch): *"[By following the ELISE course,] I got familiar with many different e-learning tools. I got to know their strengths and weaknesses, making it easier to choose whether or not to implement some of these instruments."*

The participants valued the ease-of-use of the various instruments and clearly saw the added didactical value (for example, for the Flashmeeting tool respectively 4.05 and 4.02 out of 5). However, when asked how likely it would be that they implement the novel tools in their own teaching situations, they reacted more reserved (for example, for the Flashmeeting tool only 3.0 out of 5, for the instant messaging tools 2.9 out of 5). We attribute this inconsistency in part to the very different teaching

contexts the participants encounter in their own institutions. The use of these various tools in the context of an online distance course (like the ELISE course) may differ from the manner in which these would be implemented for blended or classroom teaching, explaining why the teachers react more reserved.

The various communication tools ensured that the learners experienced the social cohesion of the learning group, even though there is only one face to face gathering. As one learner mentions: "*Many of my colleagues fear that the use of e-learning will result in a loss of the learning group cohesion and a lack of social contact. I experienced in this course quite the opposite: although I only met my fellow learners once, I have the feeling that I really got to know some of them really good during the eight weeks."* Furthermore, the value of the social learning network that was formed is clearly visible: the learners have the feeling that the contributions of their peers clearly contributed to their own learning (4.4 out of 5) and found the online social life on the discussion boards motivating and enriching (4.2 out of 5).

Our reservations towards the use of more 'Personal Learning Environments', in which the participant would gather all relevant sources for his/her own learning path in a strongly personalised environment, become also clear in the evaluation. One learner complained about the lack of structure and the abundance of tools, *"There were too many tools and websites in this course: discussion board, instant messaging, Google documents, videoconferencing, course content site, email*...", and another learner literally stated *"This course needs a much more central web location where all the course activities are bundled."* These learner evaluations make the course designers much more cautious towards the implementation of more decentral (and personal) learning paths for the learners.

4. CONCLUSIONS

We implemented a wide variety of social software tools in an online distance course for in-service teacher training. Social software tools were used as information, communication and evaluation instruments. The use of these tools resulted in an active and dynamic learning community with a very high learner retention rate. While the learners clearly value the added didactical value of the instruments and feel they are easy to use, they are more reserved when it comes to the implementation in their own teaching practices.

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REFLECTING ON THE USE OF THE VIRTUAL LEARNING ENVIRONMENT AS A LEARNING AND TEACHING RESOURCE

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Abstract

*The increasing use of **technology** within education should come as no surprise to teachers within higher education. Given the recommendations in the Dearing Report (National Committee of Inquiry into Higher Education, 1997), the use and development of e-learning is increasingly being utilised as an acceptable means of supporting students and addressing the issues of widening access and participation within higher education (Petit and Mason, 2004). This paper reviews the use of a virtual learning environment (VLE) to complement face to face teaching with a cohort of Occupational Therapy students in their first year of study on a four year BSc (Hons) Occupational Therapy programme. The use of the virtual learning environment was **evaluated** from the student perspective using **questionnaires** and from the teacher perspective using **reflection**. The evaluation was **positive** with plans made to use the findings to inform the development and integration of VLE's into future modules.*
Keywords: virtual learning environment (VLE), participation, reflection, evaluation

1. Introduction

The increasing use of technology within education should come as no surprise to teachers within higher education. Given the recommendations in the Dearing Report (National Committee of Inquiry into Higher Education, 1997), the use and development of e-learning is increasingly being utilised as an acceptable means of supporting students and addressing the issues of widening access and participation within higher education (Petit and Mason, 2004). Students who have responsibilities as carers, those with disabilities and subsequent difficulties accessing information, and the increasing internationalisation of the student population means that flexible delivery of learning and teaching materials is a means of addressing accessibility and inclusivity.

E-Learning is believed to be potentially influential in motivating students to foster a sense of independence and ownership for their learning (Rimmer, 2006). It is perceived that deep, contextualised learning can be a result of students becoming more active and engaged with learning materials, and as a result the development of e-learning as a pedagogical theory is gaining credence (Race, 2005). Using a model of experiential learning (Kolb, 1984), e-learning can be seen to influence and encourage learning through 'doing' (Race, 2005). However, it is this very notion of 'doing', which is criticised by both Rimmer (2006) and Race (2005) as having the potential to distract or overload the student due to the vast array of internet resources available at the touch of a button.

There is also an element of consternation among academics as to which elements of e-learning are most conducive to deep, contextualised meaning. For example, the use of multiple-choice questionnaires is criticised by Ramsden (1992) who infers that they are likely to induce rote learning and subsequently a surface approach to learning. Conversely, Ramsden (1992) suggests that with the inclusion of a discursive element, e-learning strategies can in fact be directly beneficial to aid learning. The virtual learning environment (VLE) is one such area in which discussion and interaction can take place, making use of 'off campus' activities, and complementing face to face classroom teaching to create diversity of learning and teaching strategies.

The aims of this paper are to consider the impact a virtual learning environment has upon the learning and teaching experience, from the subjective perspectives of both student and teacher. The Blackboard Academic Suite™ (hereafter referred to as Blackboard) is a commercial product, which is used within Glasgow Caledonian University, affording teachers the possibility of enhancing learning and teaching experiences with a platform which is subjectively viewed as being relatively user friendly for both the teacher and the student.

2. Interactive use of Blackboard

Blackboard was used as an interactive learning and teaching experience for one individual module, to evaluate the perceived impact for both students and teaching staff in relation to the benefits of e-learning in conjunction with face to face teaching. The student cohort involved was engaged with their first year of study on a four year BSc (Hons) Occupational Therapy programme. Blackboard had been used in the same module with a previous cohort of Occupational Therapy students in 2005 but its use had been limited to being a repository for course documents such as the module guide and handouts from classes. The evaluation of this learning and teaching experience was focused on evaluating how the virtual learning environment could impact upon the learning experience. Subjective perceptions and reflections of both the students and the teaching team were used to appraise this, and this information was gathered using open questions in a questionnaire and through informal discussion.

Running in the second semester of 2006, the module made use of several components of the VLE to encourage student participation, motivation for learning and a sense of ownership for the module. Discussion forums, sharing of useful resources, self assessments for formative feedback and group based activities centred on accessing and using information from the internet were all used to deliver teaching, with the aims of encouraging student motivation through engagement with e-learning.

The learning outcomes for the module included the exploration and understanding of a range of health conditions in conjunction with the impact upon an individual's occupational performance. Course documents were used to house information relating to specific health conditions, which students were directed to download and review prior to classes. With the information being reviewed by students in their own time, contact time in the classroom was then used for exploration of the health condition in relation to human functioning. Students responded positively to this method and, as they searched for additional information to complement the briefing notes, they often found books, journal articles and websites, which they perceived to

be of interest in relation to the health conditions. Students emailed their resources to the module leader and a section in Blackboard was created for sharing this among fellow students. In addition to posting information from other sources, students used their own personal and practice education experiences as a means of understanding the module content. Students made use of the discussion forums on Blackboard, which had been set up and moderated by the module leader, to share their opinions, thoughts and pose questions to their peers. Contributions were initially slow from the students, with only a handful of active participants; however as the module progressed the frequency of contributions had increased significantly.

Midway through the module, formative assessments were posted within the VLE, giving the students a set of questions to answer in relation to material covered in the module to date. The engagement with this was exceptionally positive with students asking for additional formative assignments to be created at a later point in the module.

3. Student evaluation

Given that the module had been making use of Blackboard in a more interactive way than with previous student cohorts, evaluation was required to ascertain what the students thought about it. At the midway point in the module, informal feedback was encouraged from students and this proved to be positive. Some comments were emailed from individual students directly to the module leader, while others discussed their experiences with academic advisors who then passed this information to the module teaching team. At the end of the twelve week module, students were asked to complete an anonymised questionnaire, detailing their perceptions of using Blackboard within the module. Students were asked to comment on their perceptions of how useful specific sections of Blackboard (such as the discussion forums, external links and the formative assignments) had been to their learning experience. They were also asked to indicate which sections of the VLE they accessed and how frequently they used them. Finally, students were asked to comment on their level of contribution to the discussion board, and on any reasons why they did / did not post in various discussion threads.

The results were positive. Of the 55 returned questionnaires, 33 students stated that they accessed Blackboard more than twice weekly, with 13 of these respondents stating that this was in excess of three times per week. Of the remaining 19 students, 17 indicated that they accessed the platform once weekly and 2 stated that they accessed it less than once per week.

The course documents section (where information relating to all face to face classes was housed) was the most regularly accessed with 51 students reporting that they used this section more than once weekly. In relation to how useful they found these sections, the response was similarly weighted towards the usefulness of the course documents section.

Although the number of students reporting that they actively contributed to the discussion forums was low (13), the question – which asked students to state why they had not accessed the discussion board – was enlightening. Statements such as "I usually just read what other people had put. Most of the time I just agreed but tended not to add my own contributions – I don't know why I never!" demonstrated that even without actively posting, the students found the discussion boards

interesting. The comments inferred that despite not actively contributing to the discussion due to a variety of factors such as lack of confidence or unfamiliarity with technology, students were benefiting from observing the contributions of others. One student wrote that the discussion board "...helped to assure me that many people were experiencing the same feelings as me" suggesting that the discussion forum, as part of the larger virtual learning environment, was potentially creating a supportive learning community for the cohort.

In relation to the online assignments section, where multiple choice quizzes were made available, the students made pertinent comments indicating that the VLE was encouraging a deeper approach to learning, contrary to the opinion of Ramsden (1992) who suggested that the opposite effect could be influenced by multiple choice quizzes. Comments such as "I feel that regular testing of knowledge encourages me to put more effort into learning", "I found that Blackboard provided additional useful information which highlighted further learning requirements" and "I was able to identify my weak points…and where my strengths lay. It was encouraging and also a motivation" demonstrate that students were utilising the VLE not only as a resource for their learning, but as a springboard for exploring issues further and deepening the contextualisation of their knowledge.

General comments from the students in the concluding section of the questionnaire were invited in relation to how the use of Blackboard could be improved. Again, positive statements were noted with the majority of students reporting that they had enjoyed and felt they had benefited from using Blackboard in the module. The main factor noted by students in relation to how the use of the VLE could be developed, was regarding the level of contribution from students (e.g. with the discussion forums). Replies such as "…more students sharing information" and "…could be improved by [students] sharing their findings more" exemplified this. The organisation of materials was noted as a contributory factor to student satisfaction in using the VLE and the enthusiasm for formative on-line assignments was significant. Students reported that they were positive about the use of Blackboard as an additional resource, complementing classroom based teaching sessions, and indicating that they would like to use the VLE in future modules.

4. Teacher evaluation

Using Blackboard more interactively as a tool for learning was a learning experience for both the students and me as the teacher in this evaluation. Being relatively comfortable with the learning technology and use of the Blackboard system prior to this project was of benefit to me as I felt confident to set up and moderate the discussion forum. However, designing activities, which could be used within the VLE, and becoming familiar with specific tools (such as those used to create on-line assessments) was time consuming. Dedicated time for moderating the discussion forum and managing on-line content was required, yet I found this to be problematic on occasion, given the perception that being at a desk does not equate with teaching. Canon and Newble (2000) acknowledge this factor, stating that being present in a classroom is more readily aligned with teaching, whereas moderating or teaching on-line creates a cognitive dissonance for colleagues and students who see the teacher as being 'at their desk' and not actively engaged in learning and teaching.

The activity levels of students using the VLE were monitored by a tool within Blackboard to aid 'tracking' of access to sections of the site. Reviewing this

encouraged me in that I could see that students were making use of the discussion forums and downloading preparatory materials prior to classes.

The experience of managing the module using Blackboard encouraged me to think creatively in relation to learning and teaching experiences. The creation of on-line formative assessments was received far more positively from the students than had been expected. Although designing some materials was resource intensive in terms of time, it was acknowledged that with the repetition of these activities and increasing familiarity with the VLE less time would ultimately be required for the creation of materials.

5. Conclusions

Using Blackboard within this module was a positive experience for both the students and for me. The level of engagement with the VLE was high and perceived to be complementary to face to face teaching sessions. Students endorsed the design and organisation of the module content housed within the VLE and noted this as having a positive impact on their learning experience. The level of activity and engagement from students was monitored using a statistics 'tracking' package within Blackboard. Participation from students and the collation of an external links section provided further evidence that the VLE was encouraging students to take some responsibility for their learning and a degree of ownership over aspects of the module content. Learning and contextualising knowledge was positively influenced according to the student evaluations and comments, which can be considered as encouraging deeper learning.

Using this project as a starting point, the intention is now to use the learning gained from using Blackboard within this module, to inform the development of e-learning within other modules. Reflecting on this experience will also be used to support colleagues in developing their own use of the VLE as a resource to complement classroom based activities with the aim of encouraging a deep approach to learning from both student and teacher. From my own perspective, I have gained confidence in my abilities to manage an on-line learning environment and as such I intend to develop these skills to blend my class based teaching with on-line resources and delivery in the future.

For other teachers considering the use of a virtual learning environment within their own teaching, I would encourage them to ensure that they know why and how they are going to make use of the learning environment, before they engage with it. Managing your time efficiently to allow organisation of teaching materials is as vital to e-learning as it is to face to face classroom teaching and can have a direct impact on the engagement of students with the VLE as a learning resource. Similarly, managing the learning environment itself needs to be given thought and consideration when using technology to support learning and teaching. If dealt with in an organised and structured way, the virtual learning environment can ultimately prove to be a valuable and effective resource for both teachers and students, as this evaluation has shown.

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SCHOOL INCLUSION IN THE ERA OF E-LEARNING 2.0: IS MYTH BECOMING REALITY?

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Abstract

This paper addresses the issue of school inclusion, focusing on the strong potential that Information and Communication Technologies (ICT) offers to all students, including those who, for a variety of reasons, cannot regularly attend classes and/or cannot access and use mainstream educational tools. An explanation of the basic concepts underpinning the term "inclusion" is given, and a reflection is proposed about the new possibilities on offer in the so-called era of e-learning 2.0. The major changes demanded of those school systems that are willing to make widespread use of ICT tools are also brought to light. The provocative question in the title remains open, but some new directions are outlined that could help to capitalise on the opportunities offered by new technologies and to support the full inclusion of all students in mainstream education systems.
Keywords: web 2.0, e-learning 2.0, school-inclusion, special needs.

1. Introduction

Nowadays the terms Web 2.0 and e-learning 2.0 are widely used. They both refer to the radical changes in the type and use of web technologies that have emerged in recent years. The notation "2.0" reflects the widespread perception that we are now facing a second-generation of e-tools and services, and new approaches to their use.

According to Downes (2005), who first used the term "e-learning 2.0" the Web is, in fact, evolving, "shifting from being a medium, in which information is transmitted and consumed, into being a platform, in which content is created, shared, remixed, repurposed, and passed along." E-learning is also evolving, together with the World Wide Web: the traditional model of e-learning based on "a type of content, produced by publishers, organized and structured into courses, and consumed by students, is turned on its head. Insofar as there is content, it is used rather than read and is, in any case, more likely to be produced by students than courseware authors ... The e-learning application … represents one node in a web of content, connected to other nodes and content creation services used by other students."

Leaving aside the interesting debate (Jennings, 2005) about the appropriateness of the notation 2.0, we acknowledge that the second generation of e-tools and services has a number of characteristics (in terms of structure/architecture but more importantly regarding functionalities) which can be considered significant for fostering learning and widening access to education. In e-learning 2.0 we are witnessing the adoption of new approaches to education and of an ever-wider range of new technologies, as well as new uses of technologies that emerged in e-learning 1.0. In this light, we tentatively pose the question as to whether the time is ripe to speak also of "e-inclusion 2.0", or, in other terms, if a new era for inclusion is approaching.

In the following, we discuss the issue of whether the inclusion of all students in mainstream education systems can be regarded as a more reachable goal with the advent of the 2.0 era. In this perspective, first of all, we propose a definition of the concept of "school inclusion", then we provide a panorama of the possibilities offered by e-learning 2.0 for guaranteeing identical educational opportunities and facilities to all students.

2. Trying to define school inclusion

According to the Charter of Fundamental Rights of the European Union (2000):

> "Any discrimination based on any ground such as sex, race, colour, ethnic or social origin, genetic features, language, religion or belief, political or any other opinion, membership of a national minority, property, birth, disability, age or sexual orientation shall be prohibited."

The basic concept of "non–discrimination" is directly linked to the idea of "Universal Access", which is now considered by most developed countries as a fundamental goal to be met in the near future. "Universal Access" refers to almost all aspects of social life including education (Bocker et al, 2005) and, in this specific field, it entails the ability of all students to have "equal opportunity in education, regardless of their social class, ethnicity, background or physical disabilities" (Klironomos et al., 2006).

The risk of being marginalised and of being unable to access mainstream education systems mainly regards those students:

- with physical and/or sensorial impairments;
- with cognitive disabilities;
- with specific and non-specific learning difficulties;
- who have a cultural/linguistic heritage that is different from most of their classmates' (e.g. immigrants);
- who are hard to reach because of specific personal, family or social situations (illness, social exclusion, etc…).

Students in the above categories have the right to expect the same standard of education as their schoolmates, and also to be considered and act as being an integral part of the learning community. Recognition of this right has given rise to the concept of "inclusion", which has gradually substituted that of "integration". Integration focuses on students with special needs who require specific educational interventions and this idea of integration implies that the regular school stays the same but must take steps to absorb students who present a variety of problems/difficulties (Northway, 1997).

Inclusion is a much stronger concept: the basic idea is that all students should be enabled to participate in the life and work of mainstream educational institutions to the best of their abilities, whatever their needs may be. Inclusion, besides, implies a Copernican revolution where students (each with their own characteristics and needs) are at the very heart of the educational process, becoming its main reference point.

As underlined in the Ofsted report (2001):

> "An educationally inclusive school is one in which the teaching and learning, achievements, attitudes and well-being of every young person matter. The most

> *effective schools do not take educational inclusion for granted. They constantly monitor and evaluate the progress all pupils make."*

Inclusion, in this view, is a process of addressing and responding to the diversity of needs of all learners without distinction; it is a long-lasting process which requires time, effort and strong conviction by teachers and by all those involved in students' education. The building up of an inclusive classroom also requires that suitable, effective and barrier-free educational means should be employed.

From this perspective ICT is promising; there are grounds for maintaining that it helps most students overcome barriers to learning, increasing both achievement and self esteem (Ofsted, 2004). Indeed, educational research provides strong evidence that:

> *"ICT is both a medium and a powerful tool in supporting inclusive practice. It provides wide-ranging support for communication, assisting many learners to engage with learning, including those who are hard to reach, and helps to break down some of the barriers that lead to under-achievement and educational exclusion"*
> (Becta, 2007). [The term ICT as used here covers both software tools and services (henceforth referred to as e-tools) as well as specific hardware components (henceforth e-devices)].

Observations about the positive impact of ICT on inclusive education appear to be even more well-grounded if we think in terms of "e-learning 2.0", which, because of its "user centred" philosophy, seems better suited to the idea of "inclusion", where all students should be considered as being at the heart of the school system.

3. E-Learning 2.0: what opportunities for the inclusive classroom?

As already mentioned, the concept of e-learning 2.0 reflects emerging educational trends, namely the learner-centred approach, the emphasis on active learning, creativity, communication and participation and, finally, the focus on the new social dimension of learning. This corresponds to a wide and open view of the educational process: it implies much more than just "adapting" to different learning styles, and mainly consists in giving great autonomy to the student, even entrusting them with complete control of the learning process (O'Neill & McMahon, 2005). In this framework, learning contents/material take on a myriad of different forms available from a multiplicity of sources, and the combination of more than one method for accessing educational contents is a key aspect.

Although the concept of e-learning 2.0 is, strictly speaking, independent of the possible means with which it is realised, it is often thought of in terms of a number of new e-tools such as blogs, wikis, podcasts, instant messaging, VOIP systems, RSS, social networks, online references and repositories, etc. Such means may in principle foster:

- the personalization/individualization of educational activities/itineraries;
- the active participation of all students in school life and events;
- collaboration among all the actors in the educational process.

No doubt, one of the most interesting of the new possibilities on offer is that a high degree of "personalization" of educational activities is allowed, so that there is greater possibility for adaptation to the individual needs of a wide range of learners.

Using the above-mentioned means, students are allowed to learn and work at their own pace and may also have access to a wide variety of additional educational materials. Many researchers observe that new possibilities offered for actualizing individualised learning programmes and/or activities are particularly relevant for those students who cannot attend their class regularly (Becta, 2002).

We can probably go further and say that the "inclusion" of such students in classroom activities can be fostered to a greater extent, and not merely through personalisation. ICT offers remote students a twofold opportunity for taking part in classroom activities effectively and directly: thanks to these technologies, students have the possibility to enter the classroom in a virtual way, in real time, and they also have the chance to bring and take out of the classroom learning material of any kind (text, videos, pictures, audio lessons, etc.) ready to be used wherever and whenever they need. Podcasting and audio/video streaming facilities allow "distant" students to access and use, for educational purposes, both audio and video material coming from the classroom: they can benefit from the teacher's direct explanations, they can follow discussions and classroom events of any kind. What's more important, students can do this at any time, on demand: on the net in the case of streamed educational material, and on the move in the case of podcasts.

From the point of view of students with special needs, one of the most engaging benefits coming from the introduction of distance learning services and tools in schools is that they can directly participate in mainstream classroom activities: they can be present in the classroom, attend lessons in a virtual way, participate actively, and make the others hear their "voice". Videoconferencing, instant messaging and audio/video communication services can be considered powerful tools for these purposes. To date, the need for special purpose technologies has strongly reduced the use of videoconferencing systems in schools and in education in general, even though research conducted in specific fields indicates that a wide range of social and educational benefits can accrue from the use of this technology.

With the advent of Web 2.0, there are ever-greater opportunities for engaging in online communication via technologies like videoconferencing. One of the new trends we are witnessing is that many students are dedicating an increasing amount of their leisure time to the use of online communication tools such as instant messaging, chat, VOIP tools with audio and video capabilities, etc. With the increased availability of such technologies in the Web 2.0 era, there is greater scope for educational application and thus for exploiting their potential for supporting distance participation in school activities. Using such tools, "distant" students can follow lessons, pose questions and interact from home (or elsewhere) with other class members, wherever they may happen to be.

In a sense, this is an inclusive use of technology in that the same tools can be used by all the students, irrespective of their particular needs, in order to take part in learning activities both inside and outside the classroom, synchronously or asynchronously, and to engage in collaborative activities.

As underlined before, students whose lifestyles/constraints make regular attendance at school problematic now have a number of different possibilities to communicate with each other, with their schoolmates, with their teachers, and with others; in these situations the systematic use of these tools enhances learning possibilities and may also increase overall school achievement (Condie & Munro, 2006).

There are many different internet communication services that can be used to exchange ideas, pose question and receive answers and a number of specific tools are available for those purposes. Asynchronous services such as email and discussion forums provide students with the possibility to exchange messages and network files, that is they have the possibility to exchange ideas and actual material such as texts, worksheets, tests etc. Synchronous services such as chat rooms and instant messaging environments add the possibility to do the same things in real time, allowing students to receive immediate feedback on work done and rapid responses to their questions and opinions.

Students may also join mailing lists, where they have the possibility to discuss different topics, to receive announcements, newsletters, or electronic publications. Weblogs, or blogs, which embody a specific kind of communication (unidirectional in principle but in practice open to external contributions), are also increasingly being used in education. Many personal and classroom blogs are being created for explicit educational purposes, and they have also been employed in blended education, where "conventional" instruction (in presence, offline, non-electronic) is combined with online working, tutoring or mentoring services (Oravec, 2003).

Communication is the basis for collaboration, and learning is no longer considered as a process that students should perform in isolation. The importance of cooperative/collaborative study is well known (Panitz, 2007) and the benefits of this approach to learning are reported in a variety of scientific papers drawing on innovative experimental research (Alderman, 2006). Computer Supported Collaborative Learning (CSCL) is universally considered a valuable field of investigation (Dillenbourg, 1999).

Coming back to the perspective of students with special needs, their undeniable right to be part of the classroom learning community also implies that they have the right to collaborate and cooperate with classmates. In terms of CSCL, there are a number of ICT services and tools that allow and foster cooperation among students; most services for instant messaging and audio-visual communication also provide specific environments where students can interact and produce texts or other material in a collaborative way.

The possibility to share a variety of different applications and materials is also provided by most synchronous interpersonal communication services; students are allowed to write documents collaboratively or to put together and analyze data from different sources. For example, in the Web 2.0 era, commonly used production tools such as word processors that were previously available almost exclusively as standalone applications are now moving online, with specific features designed to enhance and support collaboration, even in real time (e.g. tools such as Google Documents).

Recently, new frontiers for online cooperation have also been opened up by wikis, which permit collaborative production of online documents by multiple users, and the result can be read just like any web site. The real educational potential of wikis lies in the way they are created, in the fact that groups or single users (teachers and different groups of students, for instance) can work collaboratively on them using a standard web browser.

In this perspective, wikis are considered by most educationalists as ideal tools to support and increase collaborative work done by both students and teachers, even at distance (Augar, et al., 2004). Students can use a wiki to collaborate on a group report, gather data or share the results of their research, etc. During the wiki building process, it is also possible to keep track of the history of the document: each time one of the authors makes a change, this generates a new version of the document and the previous one is stored in a log. All the different versions of the document remain available for comparison, and if necessary previous modifications can be reversed.

In the e-learning 2.0 era, communication and collaboration can also be fostered though use of devices specifically designed to permit mobility, and whose adoption for educational purpose has led to the emergence of the term "mobile learning", or "m-learning". Using devices such as mobile phones, personal digital assistants and handheld computers, students can now carry out ICT-based learning activities in a whole variety of places, not just in settings where learning traditionally occurs, like the classroom, lab or home. As a result, there is a real possibility for the learning event to become genuinely "time and space independent" (Roschelle & Pea, 2002), with all the educational advantages this can bring, including widening the boundaries of the inclusive classroom and adapting to the essentially "mobile" nature of "learning" (Vavoula & Sharples, 2002). As an example, handheld computers can be used for allowing students to gather and elaborate data in the field during experiments. Furthermore, mobile devices can provide communication channels, to be used both during face-to-face sessions and at a distance. As underlined by Cobcroft (2006) m-technologies, "thanks to their ability to engage students in creative, collaborative, critical and communicative learning activities", offer new solutions for information delivery and sharing. From this perspective, m-learning devices certainly provide the potential for increased inclusion both inside and outside the classroom; in addition, according to a number of specific studies, it also offers a number of significant benefits to foreign and remote learners, as well as those with cognitive, behavioral, social problems, with physical or mental difficulties, the gifted and the mature-aged (Rodríguez et al, 2001; Savill-Smith & Kent, 2003; Strom & Strom, 2002).

4. Embedding new e-tools in the inclusive classroom: changes and challenges

New times, new tools and new ways of learning require many changes in classroom management and in the type of activities to be carried out. The "inclusive classroom" that makes systematic use of e-tools and devices can be seen as something basically new, and great changes are required not only of the individual teacher, but of the education system as a whole. The school should, in fact, guarantee flexible organization and should also support teachers, not only in terms of providing them with suitable equipment and infrastructure, but also with constant technical support.

The "inclusive classroom" can no longer simply be regarded as the physical place where lessons take place; the integrated use of new tools enlarges the perspective and leads us to consider the classroom more as a group of people who interact for learning purposes. The actual physical classroom exists, but is not the only place where learners and teachers meet and interact. In this scenario, community links become stronger and are not limited to school time, interpersonal relations are

fostered, students are encouraged to communicate and cooperate with each other, seeking help and advice if and when needed.

The term "open classroom" seems more in line with the idea of the "inclusive classroom" than the widely used term "virtual", as it instantiates the possible integration of the two educational environments (physical and virtual) without necessarily excluding learning activities carried out in the physical classroom.

The open classroom poses a number of challenges, one of which is that educational materials need to be stored in digital form: this applies not only to audio and video material, but also to most textual material (tests, articles, book chapters, etc.) as well as graphics. This demands new skills of both teachers and students but is not the only or indeed main change involving the two main actors in the educational process: the overall role of teachers and students changes radically, as does their reciprocal relationships and classroom dynamics. In the open and inclusive classroom teachers' and students' roles are deeply modified as they encounter new learning environments and new educational material.

The requirements demanded of teachers include:

- New views and methods for effectively incorporating new educational material and tools in mainstream activities;
- Capacity to select appropriate tools and resources in accordance with specific learning objectives and with the particular needs of learners, both as individuals and as a group, with special attention to questions of the accessibility of software and of hardware devices;
- New skills in the technological field (they need to be aware of the possibilities and of the actual functioning of the tools);
- Renewed attention to lesson planning, in accordance with clearly defined educational objectives;
- Willingness to assist learners while they are engaging with the use of technological tools (which is quite distinct from teaching the use of technology);
- Capacity to see themselves not only as teachers but also as facilitators of the educational process;
- Capacity to change the methods of evaluating students' attainment / performances.
- Willingness to keep in touch with students outside school hours.

Teachers need to adapt to a changing technological society where managing technology may occupy a great deal of time and intellectual energy. However, the demands go deeper than this: changes call for re-examination of teaching methodology. The traditional techniques of class instruction and scheduling are brought into question, the type of activities to be done may change, multiple activities may occur simultaneously, changing the ways in which the teacher might/must facilitate learning, and also changing the ways in which learners tackle educational tasks. Basically, the teacher's role in the open classroom shifts from the primary role of information giver to that of facilitator and guide; this role also incorporates mediation, modelling, and coaching, and requires a high degree of adaptivity to new learning/teaching schemes.

As a facilitator, the teacher is required to become personally engaged in public and private dialogue with students in order to assist them (face-to-face and online) throughout the whole learning process. S/he should also think of how to promote and

orchestrate collaborative study and often needs to become a co-learner and co-investigator together with the students.

On the other hand, students' new role envisages:

- Capacity/ability to use a number of technological tools or willingness to learn how to do so;
- Sense of personal responsibility and a concrete willingness to switch from passive to active learning;
- Ability to set themselves a reasonable pace for completing activities;
- Motivation to interact with the other actors in the educational process and socialize using e-tools;
- Capacity to see the teacher mainly as a guide, a facilitator who can help them to reach educational objectives.

All these changes are likely to permeate classroom procedures and influence behaviour and classroom dynamics in a permanent way. Both students and teachers are required to:

- Be conscious that technical problems may arise and that solutions can be found collaboratively, by sharing problems, previous experience, different technological competencies;
- Understand that interpersonal communication in online environments can be affected to some extent by different personal attitudes / styles (humour, mood, adaptivity, etc.) that may not be immediately apparent;
- Feel that they are both a vital part of the overall learning community;
- Be aware of the educational relevance of cooperation;
- Consider learning as a process not limited to class hours.

So far this examination has focused on the changes and challenges involving the roles of those engaged in the learning process and the dynamics of the process itself. Another aspect which requires specific consideration is the choice and adoption of technology, which may have a strong if not decisive impact on the degree of inclusion attained, as well as on the effectiveness of the learning processes set in motion. Key issues in this regard include:

- appropriateness of the technology in terms of the intended context of application and the proposed educational goals;
- awareness of possible cognitive overload intrinsic in the use of technology itself;
- the actual added value that the chosen technology offers when compared with alternative means;
- accessibility of the technology, i.e. availability to, and usability by, all members of the learning community.

Accessibility is a crucial question in this regard, as a class certainly cannot be considered inclusive if the tools and services that students are to use are not equally accessible to all. Students with disabilities may face significant difficulties both in accessing and in using e-learning tools and devices. In addition, the types of obstacles encountered may vary considerably depending on the type of impairment.

If the teacher wants to adopt mobile technologies for inclusion purposes, for example, the full accessibility and high-quality interaction of devices, applications and services

needs to be the subject of careful attention. Indeed, mobile learning raises a number of "objective" accessibility problems, many of which derive from the very compactness and portability of mobile devices. For example, people with limited manual dexterity may find it difficult to work on a PDA with a stylus. Visually impaired people may have difficulty reading the small, low-resolution, low-luminosity screen, not to mention managing arrays of small buttons with low tactile quality.

6. Conclusion

A brief overview of the new possibilities offered to education by e-learning 2.0 applications and services has been proposed. We have sought to demonstrate that, thanks to e-learning 2.0 technologies, "all" students are offered a number of new opportunities that can have a positive impact on their learning: they can easily communicate with each other and with all the other actors in the educational process (teachers, schoolmates, mentors etc.); they can participate in lessons and classroom events at a distance, and they also have the chance to study, work and perform educational tasks not in isolation but in cooperation. Such new technologies also offer significant new possibilities for individualizing/personalizing learning activities according to the specific needs of each single student.

The reflections reported here go no further than confirming the hypothesis that new tools are certainly promising and that, in the near future they may have a strongly positive impact on the building of really "inclusive" classrooms. The central question of whether the myth of school inclusion of all students (including those with special needs) is likely to become a reality in the near future remains open. The educational effectiveness of any technological means mainly depends on the choices made by teachers: in order to take a significant step forwards, the use of e-tools needs to be carefully planned and structured, and conceptually well integrated in mainstream activities. There is evidence from research (Moseley et al, 1999) that in almost all formal educational contexts e-tools do not make the difference *per se*, simply by being used: rather, what is likely to produce effective and significant changes on the whole educational process is the pedagogical idea underpinning the learning activities to be enacted. And this is certainly true in the field of special education and inclusion. According to a recent Becta report in this area (2007), the provision of technology alone will never fully capitalise on the opportunity ICT offers to inclusion without the understanding and skill of teachers in planning its implementation: "*there is a need for a clear understanding of the pedagogy of ICT and inclusive education by all those supporting children's welfare and education*".

The process of inclusion, then, can be fostered by the use of new technological tools but it also requires changes and modifications in educational contents, approaches, structures and strategies.

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Progress and Prospects: a Perspective from the CIPD

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For those who were working as training managers in the corporate world at the turn of the millennium the emergence of e-learning was a heady and challenging experience. At that time I was working as Director of Management Education and Training at Ernst and Young. I can well remember stories that our US practice, which had undertaken a heavy investment programme in technology, had developed a 'learning system'. I visited Ohio and Texas and saw an application which took advantage of the emerging internet to "produce what training would look like if it was designed by subject matter experts". I was overwhelmed. To quote from the science fiction writer William Gibson I became convinced that: *"The future's already arrived; it's just not evenly distributed yet"*

Two years later, in 2001 I was appointed to my current post as one of the research team at the Chartered Institute of Personnel and Development – the 128,000 strong professional body for those involved in personnel management and development. This gave me a unique opportunity to monitor and assess the subsequent progress of what had become known as e-learning.

The term itself first emerged in late 1999. The US-based supplier, CBT systems, rebranded themselves as 'Smartforce – the e-learning company' and held a satellite broadcast to announce the change a month later. In one sense the subsequent progress of e-learning in the corporate or business world is best understood as a resolution of the tension between two camps. On the one hand were grouped the e-learning industry, shamefully supported by Government and indiscriminate journalists. They saw a rapid expansion of e-learning driven by the need to reduce training costs – never mind if anybody was learning anything or not. On the other hand, in the early days training managers were desperately trying to make sense of the new delivery channel and the opportunity it represented.

In retrospect there was only one possible outcome. E-learning would be tried and tested in a whole range of organisations. Its expansion would depend on its effectiveness in creating learning opportunities that were relevant to the organisational context and acceptable to the learner. No amount of hype or over-selling would make the slightest amount of difference in the long-term.

From the CIPD's perspective we have witnessed three distinct phases in the development of e-learning (Sloman, 2006). The first, outlined above, could be described as 'understanding beyond the hype'. In this early phase the vocabulary was confused and applications and their value were uncertain.

In a second phase the emphasis shifted to the identification of critical issues. In March 2001 a definition of e-learning was agreed within the CIPD and offered to the profession on an e-learning debate web-site that had been established to promote discussion. This definition was: *"Learning that is delivered, enabled or mediated by*

electronic technology, for the explicit purpose of training in organisations" (CIPD, 2007a). Within this inclusive definition it was possible to identify different applications of e-learning: different ways in which connectivity could affect training delivery and learning opportunities in the corporate world. One crucial distinction to emerge in the early years of e-learning was the one between 'reusable web objects' which were deployed on the corporate intranet (or distributed via CD-ROMs) and the 'collaborative' tools of e-learning, 'the on-line discussions and virtual classrooms.' In her books and a series of articles that appeared from 1999 onwards, the leading US Commentator Allison Rossett of San Diego University used the term 'stuff' to describe the former category and 'stir' the latter (Rossett, 2003).

It was in this second stage that the term 'blended learning' appeared to describe an approach to training design that involved the use of a combination of delivery methods and in some cases learning methodology. The term subsequently achieved considerable momentum. It has been used as a convenient peg for conferences and as a title in innumerable articles. Blended learning suggests that e-learning will be most effective when it is part of an overall strategy involving the classroom and on-the-job workplace learning. Although this is a convenient label, the idea of combining different methods of instruction has a long history and 'blending' was hardly new.

The third phase, which began in 2003, is now coming to an end, involved developing best practice. By the time of the 2005 CIPD Annual training survey (CIPD, 2005) it was evident that training managers had formed a clear idea of what e-learning was about and the implications surrounding its introduction. The focus must be on the learner and delivery of e-learning could not take place in isolation from other training and learning activities. The CIPD, in September of that year, was able to offer a selection of good practice case studies on its website (www.cipd.co.uk/helpingpeoplelearn).

The 2005 CIPD Survey had shown that the main area of interest was the 'stuff' of e-learning (to return to Allison Rossett's term) – either in the form of distributed CD-ROMs or in web-based modules accessed via the intranet. There had been little take-up of the 'stir': the collaborative activity taking advantage of connectivity. The challenge facing trainers was in making effective use of this new opportunity. A slide presentation used extensively in talks to CIPD members and the conference audiences in 2005 reduced this to the following five terse bullets:

- start with the learner;
- relevance drives out resistance;
- take account of intermediaries;
- good design embeds activity in the organisation;
- Support and automate.

Our 2007 Learning and Development survey (CIPD, 2007b) includes a section of trends in workplace learning and provides further evidence of the continued if gradual growth of e-learning. Respondents were given an extended list of learning and development activities and asked how frequently they were used in their organisation. Only 24% of the survey respondents stated that e-learning was not used (with 28% responding rarely used). 67% of respondents reported that they expected the use of e-learning to increase in the next few years, with 32% saying that it would stay the same. However, only 2% of respondents identified e-learning as the most effective way that people learn in their organisation.

So what of the future? Can we expect further gradual progress as e-learning is absorbed into mainstream training in organisations? Or will new technology spring a surprise and, for example, mobile learning show a dramatic growth as the convergence of wireless and the microchip develops. My position remains unchanged. There is a need for short-term pessimism but long-term optimism. We must concentrate on the learners and not be seduced by the technology. However as our experience and learner confidence grows new opportunities will arise and will be grasped. It is the thoughtful trainers that will determine the future path of e-learning in the corporate world.

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