Measuring Success in e-Learning – A Multi-Dimensional Approach

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Abstract: In 1999 Northumbria University published a strategy document entitled “Towards the web-enabled University”. This prefaced an assessment of need and of available platforms for developing online teaching and learning which, in turn, led in 2001 to the roll out and institution-wide adoption of the Blackboard Virtual Learning Environment (VLE) now referred to as our eLearning Platform or eLP. Within a very few years we had over 90% take-up by academic staff and the eLP had become integral to the learning of virtually all our students.

What has always been relatively easy to measure has been the number of users, frequency of use, number of courses, levels of technological infrastructure, etc. However, with the publication of the Higher Education Funding Council for England (HEFCE) e-learning strategy in 2005 it became apparent that such quantitative data was not particularly helpful in measuring how the university matched onto the 10-year aspirations of that document and its measures of success.

Consequently an on-going exploration was embarked upon to try to measure where we were and what we should prioritise in order to embed e-learning, as envisaged within the HEFCE strategy. This involved a number of key approaches:

- The measures were broken down into manageable sizes, creating sixteen measures in all with descriptors for “full achievement” through to “no progress to date” with suggested sources of information which would support the description. A series of interviews with key staff were set up in which they were asked to rank where they felt the university stood against each measure and what evidence would support their views.
- An academic staff survey was developed on-line which invited staff to explore a number of statements based around the HEFCE criteria and express degrees of agreement. This was followed up by a range of face-to-face interviews.
- An online student survey was developed and students were asked to express degrees of agreement with these.

Student responses were followed up with an independent student focus group exploring issues in greater depth.

The outcomes of the three approaches were then combined and an interim report prepared which identified strengths and areas for further development. Some of the latter are already being addressed.

Subsequently, the university joined phase 2 of a national benchmarking e-learning in Higher Education exercise, running from May to December 2007, supported by the Higher Education Academy (HEA) and the Joint Information Systems Committee (JISC). During this exercise we engaged in a deeper exploration against a wider set of criteria, based upon the “Pick & Mix” (Bacsich, 2007) methodology. Pick&Mix comprises 20 core criteria and the option of a number of supplementary criteria. Through these approaches we will be able to set a baseline for where we currently are and it will allow us to revisit criteria later to measure our progress in those areas we identify for development.

This paper shares methodologies used, identifies key outcomes and reflects upon those outcomes from both an institutional and sectoral perspective.

Keywords: measuring, benchmarking, methodology

1. Background

Northumbria University is a large metropolitan university based in Newcastle upon Tyne in the north-east of England. It currently has over 1100 academic staff (full- and part-time) and in excess of 32 000 registered students.

In 1999 the university’s senior management group developed a paper, “Towards the web enabled university”, which outlined a strategic plan for the development of what is now known as e-learning across the university. A major strand in this strategy was the exploration and introduction of a virtual learning environment (VLE) and to that end, a number of potential platforms was explored. By early 2001 the decision was made to run a proof of concept exercise with the Blackboard VLE. This proved very successful and consequently the VLE was rolled out across the university for academic year 2001-2. Later, in 2003, we introduced the fully integrated managed learning environment (MLE). By 2005 we had over 90% take-up by academic staff with 32000+ students attached to live sites (Bell & Bell, 2005). Later we introduced the integrated content management system and have subsequently undergone further upgrades.
The university recognises that e-learning is not simply making use of a VLE but covers a broader spectrum of information and communication technologies (ICT). To that end, for the purposes of the exercise described here, we have adopted the HEFCE (2005) definition, “The Government e-learning strategy defines e-learning as any learning that uses ICT.” (HEFCE, 2005) and, more succinctly from JISC, “Learning facilitated and supported through the use of information and communications technology.” (JISC, 2005).

2. Rationale

Why did we want to measure our progress in e-learning? After six years during which teaching and learning had made integral use of both the VLE and other ICTs it was timely to see where we were and how we compared with the sector. A key driver for this came from senior management who wanted to assess how well we stood in comparison to three key papers, both external and internal. The first of these is the HEFCE e-learning strategy, (HEFCE, 2005) which gave a blueprint of where the successful implementation of e-learning would take the UK higher education sector over the succeeding 10 years. The second external driver is the government’s Department for Education and Skills (DfES) document, “Harnessing Technology: Transforming Learning and Children’s Services” (DfES, 2005) which looks at how e-learning should contribute to all education, including school, further education, higher education and life-long learning, setting targets for each sector. A third major driver was Northumbria’s own Learning and Teaching strategies (2003-2006 and 2007 - 2010) in which e-learning is embedded.

Finally, in an increasingly competitive market, the university is keenly aware of the need to remain at the forefront. To that end we need to be able to measure ourselves against the competition.

3. What did we want to measure?

The problem facing Northumbria, in common with other educational organisations, is that many of the things which are easy to measure e.g. numbers of users, of courses, page hits etc. only provide quantitative data. This kind of data provides information on quantity and extent of use but not on quality and depth of that use. Excellence in provision of infrastructure can be gathered from a range of sources, for example, Northumbria’s IT provision has led to it being named “the UK’s most IT-enabled Organisation” at the Computing Awards for Excellence, 2006. Whilst this recognises the excellent work undertaken to ensure technical infrastructures are firmly in place, it was important that we also reflected on how effectively that technology was impacting upon the learner’s experience and upon teaching and learning across the institution, and those qualitative things are what is hard to measure.

The HEFCE (2005) measures provided a sound framework around which to build our exploration. These state:

“We consider the Higher Education (HE) sector to have embedded e-learning where:

1. ICT is commonly accepted into all aspects of the student experience of higher education, with innovation for enhancement and flexible learning, connecting areas of HE with other aspects of life and work.
2. Due to more coherence and collaboration, technical issues have been addressed to give better value for money.
3. Students are able to access information, tutor support, expertise and guidance, and communicate with each other effectively wherever they are. They are able to check and record their achievement in a form designed for multiple uses to enable personal and professional development.
4. Tutors have tools for course design to enable better communication between them and their students, giving feedback and targeted support. Individual teachers have access to information about the materials available, and support for continuous improvement of them.
5. Subject communities are able to share materials in ways that enhance their ability to produce customised high quality courses. They are supported to work collaboratively in designing materials, which are effectively quality assured and widely disseminated. They have access to research information to inform curriculum development and research-based teaching.
6. Institutions are able to build appropriate infrastructure and resources support for integrating registration and learning functions. They have links with regional networks of institutions to support progression and community involvement.
7. Lifelong learning networks support connectivity between institutions to provide seamless access for students and staff.
8. **Staff are supported at all stages to develop appropriate skills in e-learning, and these skills are recognised in their roles and responsibilities and in reward structures. They have access to accreditation for their level of skills and professional practice in linking learning technology with teaching.**

*HEFCE strategy for e-learning, March 2005, pg.9*

4. **How – the multi-dimensional approach**

At the end of the 2005-2006 academic year we set in train a number of actions in order to try to get to the rich data which would allow us to measure our progress against the HEFCE strategy’s aspirations. In order to get as full a picture as possible it was essential to involve as many stakeholders as possible.

Essentially we wanted to know:

- What management thought was happening;
- What those at the chalk-face experienced;
- What those on the receiving end felt, and
- What additional evidence supported these perspectives

4.1 **Management**

The HEFCE document was broken into 16 strands (Bell, 2006, pp 19-21) with statements which would indicate the degree of progress towards achievement of that element. In addition suggested areas to look for evidence which might indicate progress were identified. Respondents were asked to rate progress towards the strand using a 3 – 0 scale with 3 being “fully achieved” and 0 being “no progress yet”.

The second stage was to identify the appropriate people to interview to gain their views on progress towards the targets. Accepting that there was no single individual in a position to address all 16 aspects a range of key people from across the university were interviewed. Amongst other aspects, these included senior colleagues from Learning and Teaching Support, IT Services, Library and Learning Services, Academic Registry, Human Resources and the University Learning and Teaching Committee. Evidence in support of the responses, including reviewing policies, was then collected.

4.2 **Students**

The HEFCE strategy is very broad in its range and not all sections will have a direct impact upon students. Consequently a questionnaire was developed which would address those aspects of the strategy which students would be in a position to respond to (see Bell, 2006 p. 23). The survey was carefully constructed to gather information around nine aspects of e-learning. For each aspect two conflicting statements were developed (this was to ensure validity). These were arranged on the questionnaire in such a way that conflicting statements were not adjacent to one another. The survey was then put online and also made available in hard copy and students who responded offered entry to a prize draw in order to encourage participation. Available responses were “totally agree”, “partially agree”, “partially disagree” and “totally disagree” (there was no option to sit on the fence). The survey was made available from April 10th to June 2nd 2006 and elicited responses from 1700 students although some students did not answer all questions. An independent qualitative data collection exercise took place during Semester 1 2006-7. Northumbria’s Students’ Union was commissioned to undertake this and set up focus groups to gather data.

The student survey covered the following areas:

- How integrally ICT was incorporated in their everyday experience - levels of perceived computer use;
- Their perception of access to an appropriate range of software;
- How easy it was for them to access study materials and support off-campus;
- Whether they were able to use ICT effectively for their personal development plans (PDPs);
- How effectively the technology enabled them to communicate with their peers (initially there were also statements about the levels of contact, feedback and support from tutors but these were withdrawn in the light of sensitivity about the industrial dispute as perceived as being potentially critical of academic staff);
4.3 Staff
A survey of staff perceptions was begun in June 2006 and was available online until the end of October 2006. This survey had 15 statements which closely reflected the HEFCE strategy as well as the 16 strands of the management audit (see Bell, 2006 p. 24). Respondents select responses from “totally agree”, “partially agree”, “partially disagree” and “totally disagree”, again with no option to sit on the fence. Once the survey closed a qualitative data collection exercise was undertaken through individual interviews to add further rich data to the outcomes.

4.4 Other sources
In addition to the surveys and questionnaires described earlier, a broad range of other sources were accessed to help provide a broader and deeper picture. These included:

- Learning & Teaching Strategy 2003-2006
- IT Strategy
- Library and Learning Services Strategy
- Strategy for research and consultancy
- Schools’ Academic Development Plans
- VLE statistics,
- Staff development statistics
- Help-line information
- Access statistics
- Distance learning courses survey
- E-learning enhancement group minutes
- Course information
- Job vacancies web-site
- etc.

Many of these sources needed to be revisited in the next phase of our exploration, as part of the e-learning benchmarking exercise of which we are currently approaching completion. It also enabled us to do some drilling down into specific areas of the university’s provision as detailed in section 5.3.

5. The second phase
At the same time that we were exploring how we stood against the HEFCE measures, a national programme for benchmarking e-learning in Higher Education was under way. In 2006 a pilot exercise took place followed by phase 1 which ended in early 2007. Northumbria took the decision that the logical next step for us was to become involved in phase 2 of this national project. That phase ran from May 2007 to January 2008. At the time of writing we are in the final stages of the exercise.

5.1 Background to the HEA/JISC benchmarking exercise
When the HEFCE e-Learning Strategy was published in March 2005, it was a result of a wide-ranging consultation with the UK Higher Education community. One of the emerging issues from the feedback generated by that consultation was that it would be helpful to institutions to have some kind of benchmarking exercise to help them to judge how effectively e-learning had been embedded.
Consequently the Higher Education Academy (HEA) put forward a proposal to HEFCE to take the lead in an e-learning benchmarking exercise in partnership with a team from the Joint Information Systems Committee (JISC). The HEA and JISC were given the go-ahead to embark on the exercise in mid-2005. By the end of that year consultants had been appointed and a number of institutions identified to be involved in the initial stages of the exercise.

In December 2006 the call went out for expressions of interest to be involved in phase 2 of the exercise and it was at that point that we decided it was both timely and appropriate to become involved.

5.2 Benchmarking methodology

The HEA offered a range of benchmarking methodologies (HEA, 2006) and after careful consideration and consultation Northumbria chose the Pick&Mix (Bacsich, 2006a) approach. This approach provides a range of criteria against which to measure the institution. The methodology comprises 20 core criteria with level descriptors from 1 – 5 for each with an additional level 6 to denote excellence. It also offers a range of supplementary, optional criteria and it is expected that institutions will choose a further five or six criteria from these. However, there is also the opportunity to develop local criteria or to use criteria from other benchmarking methodologies (HEA, 2006) or from within the European Association of Distance Teaching Universities’ (EADTU) E-xcellence project (EADTU, 2006).

5.3 Northumbria’s approach

Once our expression of interest (EoI) had been approved (Bell & Farrier, 2007) we set in train a number of actions. The submission of our EoI had the approval and support of an internal committee chaired by the Deputy Vice Chancellor (DVC) with responsibility for teaching and learning. It included a management structure for our benchmarking exercise. This comprised an advisory panel chaired by the DVC and with representation from all key university services (at director level) as well as representatives from schools (at associate dean level), chairs of e-learning groups and from the Students’ Union. The purpose of this panel was to support and guide the exercise and to provide access to sources of evidence. Alongside this was an operational group which included academic staff, a researcher and project assistant. This was the group which actually undertook the work. Resources for the exercise were principally provided internally with some input from HEA external consultants.

In terms of selecting supplementary criteria, a consultation exercise was undertaken and feedback from that enabled us to identify those six additional criteria which are of particular relevance to our institution. These relate to uniformity, ubiquity, widening participation, personalisation, student satisfaction and e-portfolios.

To make the whole process manageable we undertook an exercise in order to “chunk” the criteria into achievable work packages. Two issues had a major bearing upon how the chunks were organised. Firstly we took into account the sources of evidence which would need to be explored in order to address the criteria. For example, some criteria require interviews to take place with members of senior management. These were chunked together to avoid the need for multiple interviews with the same people. Other criteria clearly lend themselves to desk research, and so on. This provided us with seven chunks which were then pulled together into six work packages:

<table>
<thead>
<tr>
<th>Work package</th>
<th>Criteria (numbers)</th>
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</thead>
<tbody>
<tr>
<td>WP1</td>
<td>04 usability and 05 accessibility</td>
</tr>
<tr>
<td>WP2</td>
<td>02 VLE stage, 07 decisions (projects), 19 decisions (programmes) 20 Quality enhancement</td>
</tr>
<tr>
<td>WP3</td>
<td>08 pedagogy, 14 evaluation, 17 quality assurance, 18 staff recognition and reward, 95 e-portfolios</td>
</tr>
<tr>
<td>WP4</td>
<td>06 e-learning strategy, 15, organisation, 72 personalisation, 94 student satisfaction</td>
</tr>
<tr>
<td>WP5</td>
<td>03 tools, 09 learning material, 16 technical support to staff, 51&amp;52 uniformity and ubiquity, 70 widening participation</td>
</tr>
<tr>
<td>WP6</td>
<td>01 adoption, 10 training, 11 academic workload, 12 costs, 13 planning (annual)</td>
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</tbody>
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NB – criteria numbers relate to those in Pick&Mix – version 2.0 (Bacsich, 2006)

Work packages were then matched on to the particular expertise and strengths of operational group members. However, we recognised the need to remain flexible and it later proved desirable to revise the original work packages in the light of changes in staffing, pressures of workload and other responsibilities. It was also essential that each work package “owner” was supported by other members of the operational group and that close attention was paid to where evidence could be used to support outcomes of other work packages.
After attending an initial kick off meeting hosted by the HEA, Northumbria was joined by nine other UK institutions using the same methodology and this cohort was supported by external consultants employed by the HEA specifically to support the benchmarking process. In addition to organising a series of cohort meetings, part of the consultants’ roles has been to visit participating institutions several times during the exercise to support the process and to assist in the final scoring activity. Consultants also worked on the identification of sector-wide areas for development.

Given the tightness of the timescale (May 2007 to January 2008) the work was very intensive and one of the key early activities was to undertake a preliminary scoring activity which then provided us with an early indication of where in depth research would need to be focussed. If, for example, we allocated a score of 3 to criterion 95, e-portfolios, then how well did the evidence support this and might the reality actually be different?

A second priority concerned identifying areas where it was appropriate to undertake a “slicing” activity where an individual element of provision, be it a school, an approach to delivery (e.g. collaborative working with partner institutions) or even a service (e.g. library services). At this point we identified two schools with the potential for slicing and who were keen to undertake this, and a delivery area which concerned partnership franchises and collaborative ventures.

Interim outcomes from our initial exercise were reported in late 2006 (Bell, 2006) and final outcomes of the HEA benchmarking exercise are being reported in January 2008. Since the benchmarking exercise should provide us with a base-line assessment of our position, it will enable us to review future progress and development on a regular basis and it is our intention that the exercise be repeated, probably on a two- or three-yearly basis.

5.4 Data gathering

It was essential before we embarked upon the benchmarking exercise to engage in an interpretation of the criteria in the Northumbria context and to identify likely sources of data/information. This exercise was valuable since criteria were, in places, rather too generic.

The data gathering exercise began in earnest in June 2007 but hit a hiatus in late July and August due to the summer break. Much management, staff and student feedback was already available based upon questionnaires, interviews and focus group reports and this meant that the main focus for research was the documentary evidence – policies, minutes, papers, strategies – to support the investigation with interviews and focus groups being available if needed. In addition a presentation was given at the annual Northumbria Learning and Teaching Conference where participants were involved in engaging with the criteria.

An evidence room was set up for the documentation to be stored in appropriate criterion boxes and this resource continues to be built upon continuously as new policies are released and initiatives engaged in. Additionally, the bulk of “discovered” evidence is also available electronically, although a proportion is only available internally to the university.

By mid-November criterion sheets were completed for all criteria, although the team recognised that this was an arbitrary cut-off point, in order that they could be collated, edited and distributed in time for the final scoring meeting. For each criterion there were four main sections –

- Criterion interpretation and key questions;
- Sources of evidence (with links where appropriate);
- A commentary on case studies
- Two exemplars, one of typical practice and one of effective, innovative or noteworthy practice.

The final scoring meeting was held in late November 2007, chaired by a senior member of university staff with both advisory panel and operational team members contributing, along with an external consultant. This then allowed the initial preparation of reports for a range of audiences – internal, public, the HEA and the consultants. The drafting and redrafting process is currently nearing completion.
6. Initial findings:
The first stage of the exploration revealed a number of issues and indicators for future development and review. When allied to the outcomes of the benchmarking exercise, they indicate that Northumbria has a number of strengths in e-learning. Although the initial work packages offered coherence in terms of managing the exercise, when reviewing outcomes and areas the criteria cover we found it helpful to group them into five categories. Whilst there are overlaps in many cases, the categories offer a potentially coherent way forward.

The five categories are:
1. Organisational and technical infrastructures and strategic planning;
2. Quality assurance, enhancement and evaluation;
3. Staff experience, support and development;
4. The learning journey;
5. Student experience and support.

The diagram below illustrates how the categories interact with the Pick&Mix criteria.

Our findings indicate that Northumbria has a great deal to celebrate. The Computing Award for Excellence, 2006, reflects the breadth and strength of the underlying technical structures put in place by the university, including the VLE, campus-wide wireless access, thin client architecture, open access labs and excellent electronic library resources. In addition both staff and student surveys indicate a high level of satisfaction showing that ICTs form part of the everyday teaching and learning experience. The virtual universal take-up of the VLE and its on-going development indicate, again, the ubiquity of ICT use across the institution.

Summarising some of the interim and final findings, the following areas are highlighted:

- Organisationally and technically there are many strengths. The range of ICT tools and facilities available to learners and teachers is excellent and the university has demonstrated expertise in the implementation of major elearning projects. At the same time sound, interconnected strategies have been developed incorporating elearning across a broad range of these. An excellent set of structures is in place to support staff training and development. Decision making for elearning developments is embedded within the work of schools, departments and subject divisions.

- Areas for further development include the need to incorporate elearning expertise into staff roles and into the staff recognition process. Furthermore, emphasis upon the different emerging pedagogies relating to online learning could form a key strand in future staff development to ensure effective development of new delivery approaches for programmes and modules. In common with many other Higher Education Institutions (HEIs), costing models and workload models which take into account the extra requirements for elearning have yet to be developed.
Further, we do not currently have a single locus for the coordination of developments within the elearning field.

- With respect to quality assurance, enhancement and evaluation, robust systems are in place to ensure that online teaching and learning materials adhere to appropriate standards particularly of accessibility and usability. Evaluation of provision is well regulated and effective. Approaches to quality enhancement are under constant review and needs responded to.

- In common with many similar institutions, ensuring current systems and approaches keep pace with elearning can be problematic. There is a need to ensure that staff development reflects this shifting arena. The burgeoning growth of online materials and delivery can present quality assurance difficulties and this is an area for further exploration and development. Indeed, many systems which are effective for conventional teaching may need to be reviewed to take account of the changes elearning brings.

- Staff at Northumbria have wholeheartedly adopted the use of our VLE and a range of rewards are available which recognise expertise in the area. There is good central support available to staff to assist in the development of elearning and in some areas of the university elearning development is recognised as being time-consuming and allowances are made for this.

- We recognise now the need to move on from baseline adoption where the VLE is used by a proportion of staff as a document repository and encourage the use of the technology for collaboration, communication and interaction within elearning. The changing and emerging pedagogies associated with this will require embedding. Greater access to support will become essential to engage all staff in using elearning at a deeper level.

- Our students’ learning journey is greatly enhanced through the use of online learning. Most provision matches well the Neilson (2003) usability criteria and access to elearning is both ubiquitous and uniform across all provision, both campus-based and beyond in partner institutions.

- There are, though, areas for development. In common with many other institutions engaged in the benchmarking exercise, accessibility is an issue. Efforts made to ensure software is accessible are to be celebrated but the same level of vigilance could be applied to all materials offered to learners within the VLE and elsewhere. There is also a need to ensure that, with expanding provision, access and uniformity of provision is maintained.

- Our students are very positive about their elearning experience. The student survey and other student feedback indicates that students are very happy with both the quality and quantity of facilities and see ICT as integral to their studies, with 89% expressing satisfaction with the former and 96% using ICT in their daily studies. They are also happy with the levels of support available.

- Two areas in particular suggest the need for further development. The full potential for e-portfolios for personal development planning is an area currently being explored. Given recent EU and national aspirations, on-going development is desirable. Secondly, the disparity found by students between different module sites within the VLE is of concern and consideration needs to be given as to how equality of provision can be maintained. This relates to consistency of approach and of use by academic staff.

The Benchmarking Exercise has revealed that Northumbria’s approach to elearning (and indeed to all learning and teaching) has a great deal to commend itself upon. What is also evident is that there are opportunities for further development which would contribute towards the delivery of an outstanding experience for all students and staff.

7. Initial responses

Following the preparation of the interim report presented to an e-learning strategic management group in late 2006 some actions have already been begun.

Reflecting on the patchy take-up electronic personal development plans (PDPs) an immediate response was to develop a strategy to encourage the development of these and to provide appropriate staff development. In terms of quality assurance of taught courses, we are actively reviewing the processes we have in place for validation of programmes, with an initial focus upon distance and blended learning. A key area for action concerned staff development and currently a review of our approaches to this has begun with the
expectation that this will lead to greater coherence in this provision. Related to this, a review of how we recognise and reward staff skills and expertise in e-learning is being planned. In a further development, students are now able to access their record of achievement online.

The preparation of the new L&T strategy saw e-learning embedded within it and will be accompanied by the development of a number of implementation plans with one specifically for e-learning. In addition, individual schools’ academic development plans will need to indicate how e-learning will impact upon their future work.

These are practical outcomes from the first phase of our measurement exercise. The second phase has highlighted a number of additional areas of strength and areas for development (see above). It is the intention to prioritise these and to that end a process has begun which will involve a broad range of stakeholders in exploring and identifying where priorities are and where responsibility for their further development lies. Subsequently implementation plans will be put in place and actions reviewed on a periodic basis, leading to a repeat of the process in three years’ time.

8. Lessons

Engaging with the benchmarking process has a number of major benefits for the university. It has helped us to celebrate strengths and identify areas for further development. This is particularly relevant as e-learning imposes different needs and constraints upon the planning, preparation, delivery and maintenance of learning and teaching situations.

The slicing aspect of benchmarking has provided the opportunity to explore local practice within the overall university context. One of the difficulties which arise in institutions of this size is the tendency for a silo effect to take place. The benchmarking exercise has allowed us to explore and celebrate effective practice across schools and should enable and encourage institution-wide dissemination. Slicing is still on-going and expected to report in early 2008.

In the same way, the identification and use of exemplars of both typical and innovative or noteworthy practice provides a picture of what is standard practice and what is achievable. It has helped to highlight areas for development and the art of the possible.

One of the difficulties we encountered when engaging for the first time with the HEFCE measures of success was that they were not broken down into manageable statements and needed time spent in order to make sense of them in a way which allowed comparison. Furthermore, it proved necessary to create a scoring system to apply to the measures. The advantage with the Pick&Mix methodology was that it had a recent history of development, had already been used in two earlier phases of the exercise and had, consequently, gone through an iterative process leading to a better focus and refinement. This meant that the methodology was quite straightforward to use. However, against that, because the methodology had been refined, it could become something of a straitjacket. As detailed in section 6.1, a number of criteria need to be reviewed. Further criteria which focus upon the student experience need to be incorporated and the rigidity of the core criteria would benefit from relaxation. Interpretation of criteria can also be problematic and a recommendation to the consultants would be to revisit core criteria and ensure their meaning is clearer.

An interesting consequence of the exercise has been the opportunity to engage with the broader HE community. Within our specific cohort was a range of HE providers, from small focussed institutions to large institutions like ours. This meant that a variety of perspectives have been available. Interestingly, we have discovered a great deal of common ground in terms of areas for development and this has created the potential for collaborative activities.

Reflecting on process, a number of lessons have been learned and future benchmarking activities will benefit from these.

1. In future it would be advisable to create a clear division between project management/coordination and the collection of data. The complexity of the process and the changing availability of staff meant that there was limited slack and the project management ended up carrying a larger burden than was comfortable in terms of hands on data collection.

2. We discovered that a more effective approach than simply carving up criteria was to approach from two directions at the same time – criteria identifying and interrogating data and also data “tagging” criteria. This helped reduce duplication and repetition and speeded up the process.
3. Reliance on an external methodology was, in places, inhibiting. In future we would take only those elements which were appropriate to our context and cover other elements based upon our own criteria. We need to be able to find out what we need to know rather than cater to the needs of an external driver.

4. This exercise was partly to enable the HEA and JISC to gain a broad-brush impression of the state of e-learning across the sector. Any future benchmarking activity can focus upon the specific needs of Northumbria, relating closely to its policies and strategies and reflecting upon these in the light of national strategies.

It is also important to recognise the risks inherent in undertaking an exercise of this nature. Firstly, if undertaken in a totally impartial way, it can reveal uncomfortable disconnects within overall provision. Secondly, although the exercise is specifically about e-learning, it is revelatory of the much broader learning and teaching practice identifying areas of concern which are not confined to e-learning alone. Thirdly, there is a danger that, once completed, actions will be undertaken to tackle the “easy” areas for development and others may be left in abeyance or ignored. In a large institution like ours there is also a danger of the buck being passed and only limited action taken as the issues are “somebody else’s problem”.

However, the risks of not reviewing provision in such a robust way are also great. In the current highly competitive global higher education market, provision which fails to match need will suffer. By undertaking an exercise of this nature, institutions can ensure relevance and currency which match learners’ needs.

9. Conclusion

Although the measurement exercise has a largely internal focus we are also committed to disseminating outcomes more widely and, particularly through the HEA. In places the tools used are very specific to the UK, but the process and many of the associated actions are of relevance to all educational institutions who are engaged in aspects of e-learning. Interestingly, we have found that many of the criteria and measures we have used, with some additions, could be applied to learning as a whole. A broad version of the Pick&Mix criteria has been developed incorporating an additional 11 supplementary criteria with the specific intention that it can be applied to all learning and teaching, not only that which is prefixed with “e-”.

For Northumbria University, measuring our progress in e-learning has already helped us to focus upon areas for further development as well as areas of strength. The continuing cycle of improvement in which the university engages provides benefits for the whole institution, individual areas within it and for the wider HE community in the UK.

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Is a Blended Learning Approach Suitable for Mature, Part-time Finance Students?

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Abstract: Blended learning is a pedagogy that is sometimes heralded as the answer to some of the problems which part-time students face. Creating a module for part-time students with some e-learning elements is time consuming and resource intensive. Therefore it must be demonstrated that the investment in such innovations will benefit the students and create wider learning opportunities in the most effective manner. A small investigation has been conducted which has looked at the learning needs of part-time finance students at The University of Winchester to see whether a blended approach would have benefited their studies. The results of this investigation have been used as the basis for developing the course to allow a more blended style. This paper attempts to outline how the course was designed and to do a preliminary analysis of the use of blended learning for part-time mature finance students.

Keywords: Blended-learning, finance, part-time, mature-student, e-learning

1. Introduction

The Business Management B.Sc. Programme at the University of Winchester contains a third year Financial Management module which is taught to a full time group of students and another part-time group at a different campus. The full time student group is made up of students who fit the younger profile of UK undergraduates; the part-time group is made up of mature students. As part of a policy of widening participation such mature students, who hold a merit profile Higher National Diploma (HND), achieve a degree within two years on a part-time basis. These Business and Management Bachelor of Arts (BAMBA) students undertake the study of modules sequentially, instead of concurrently. The Financial Management module is delivered to these part-time students in six lectures and two whole day intensive sessions. There are two major problems. Firstly, part-time students are subject to many distractions from work and family commitments. Secondly, the study of Financial Management, although very useful to students in their commercial careers, is often considered to be a difficult and dull subject. For example, Arthur et al (2004) reported that many students found that the initial accounting knowledge set to be both boring and difficult to assimilate and as a result, many students abandoned their accounting studies at this early point. However, Financial Management is a mathematical, precise and bounded subject lending itself to the use of information technology. It is potentially an ideal subject for the imaginative use of a blended learning approach to motivate and educate part-time mature students working in an online environment.

The term ‘blended learning’ covers a wide range of approaches. Grey (2006), summarized the rationale for using a blended learning approach as the selection of an effective and proven learning model, capitalizing on the strengths and benefits of technology-based training as well as classic self-study, classroom, and on-the-job instruction in a ‘mix and match’ format tailored to the specific training needs of each organization. Macdonald (2006) states that ‘blended learning’ is associated with the introduction of online media into a course or program, whilst recognizing the benefits of retaining face to face contact with students. Grey (2006) states that blended learning combines e-learning (using a mix of IT based learning resources) with a variety of other delivery methods to provide for a superior learning experience. Santy and Smith (2007) stress that e-learning techniques can be ‘networked’ via computer connection using an institutional virtual learning environment (VLE) or more likely the Internet to enhance knowledge, skills and performance. A short study investigated the learning needs of part-time mature finance students at the University of Winchester and concluded that such a ‘blended learning’ approach with the aim of providing a ‘superior learning experience’ using a mix of IT based resources coupled to continued ‘face to face’ instruction’ could be of benefit.

This development coincided with the timely availability of the Modular Object-Oriented Dynamic Learning Environment (Moodle) e-learning platform. This paper outlines how the development of the ‘blended learning’ approach to a Financial Management module was carried out and provides a preliminary analysis of effectiveness of a ‘blended learning’ approach in meeting the needs of part-time mature finance students.
2. The rationale for a blended learning development at the University of Winchester

The major institutional rationale can be seen in the context of the University of Winchester’s strategic objective to focus on the formative effects of challenging and supported higher education and to prepare individuals for employment and their subsequent lives. For part-time students at the University of Winchester, it has been found that trying to achieve this laudable objective can be degraded by lack of study time and the trade-off with ‘social’ or ‘family’ time. As found during surveys of BAMBA part-time students, other factors such as access to resources, lack of interaction with other students and travel time can also have a serious impact on part-time students. Internal curriculum design work has also shown that part-time Financial Management students need better cognitive and enabling skills in the areas of self-directed research, e-literacy skills and use of computerized spreadsheets as well as exposure to commercial accounting software to improve employability. There is also some external evidence from several UK universities that the use of blended learning techniques also helped them recruit and retain ‘full time’ students, who were really ‘part-time’ because of work commitments (Sharpe et al, 2006). Therefore, there are some compelling institutional reasons to develop the Financial Management module to support a diverse group of mature part-time students by meeting individual needs and provide for improved student skill development, in addition to any benefits to be gained by successful study of the subject of Financial Management.

The course specific rationale for the introduction of a blended learning approach to the Financial Management module is based on the need to address specific issues identified during the 2005-6 semesters which were:

- The assignment and examination marks of part-time students were notably lower than those achieved by the full-time students.
- Many part-time students requested extension concessions for their assignment and the examination due to work/personal life problems.
- There were a number of part-time students who missed classes because of commitments and who were unhappy about having to do so.
- Part-time students expressed real anxiety about the difficulty of studying Financial Management and that they lacked the time to study with the intensity that the module guidelines required.

Blended learning research has shown that its use on specific courses generates favorable responses from students. Hall (2006) found that e-learning engagements can have a positive impact on the learning experience. Many of the case studies which have examined the effect of blended learning on the student learning experience note that the ‘virtual learning environment is more effective, efficient and satisfying than the traditional learning situation’ (Koskela et al, 2005, P.21) where there has been the ability to ask questions and evaluate their own learning. The literature also supports the idea that a more blended approach to learning may better suit mature part-time students. For example Hart et al (2005) examined using blended learning techniques in nurse training and found that it allowed these mature part-time students a more flexible and attractive route for learning. Blended learning is about providing a superior learning experience. Therefore, its adoption for part-time students must address their specific problems associated with lack of study time and the trade off of ‘study’ time with ‘social’ and ‘family’ time. A blended learning approach with access to online resources was seen as being flexible enough to cope with students’ absences and have a sufficiently rich content to remove students’ anxieties about the scope and level of the work.

The pedagogic rationale for the introduction of blended learning are summarized by Mayes and de Freitas (2004) cited in Sharpe (2006) which organized blended learning styles into ‘Associative’, ‘Constructivist (individual/cognitive or social) and ‘Situative’ models. Firstly, the associative learning model proposes that students learn by being able to relate concepts in a chain of reasoning. Computer quizzes are thought to aid associative learning as they are based on stimulus-response conditioning. It is proposed that by undertaking computer quizzes repeatedly, reproduction and recall are aided for example when such techniques were employed at the University of Dundee, the pass rate for a chemistry course increased significantly. Secondly, the constructivist learning model proposes that students learn through the assembly of ideas and skills though interaction, experimentation and feedback. In a constructivist model of blended learning such learning is enabled by allowing discussions, collaboration and social interaction. However, the implementation of a constructivist approach to learning can be varied. When discussion boards were used in a University of the West of England Nursing Module, it was found that students were reluctant to criticize other peoples work and no high level of constructionist learning was apparent. These were also the findings in a case study which examined the use of on-line ‘chat’ facilities. It was found that students did not use the forums in the way that was intended, predominantly using as a ‘fun’ forum and were reluctant to use it as a
learning tool because they were aware that many other students may not be using it (Kirkpatrick, 2005). More positively, in an attempt to use online games to teach database design based on problem base/constructionist pedagogy, it was found that the drop out rate for the course was reduced and the overall average mark for the course improved (Connolly et al, 2006). Thirdly, the situative learning model proposes that students learn through the participation in communities using observation, mentoring and problem solving. This model is perhaps more appropriate for post graduate and professional work (Sharpe et al 2006).

During this period the University of Winchester was starting to introduce a new VLE based on the Moodle Course Management System (CMS) which is widely used. Moodle is described as supporting a ‘social constructionist pedagogy’ (Rice, 2006, P.9) where the style of learning is highly interactive and ‘emphasises that learners (and not just teachers) can organise and contribute to the educational experience in many ways. Moodle’s features reflect this in various design aspects, such as ‘making it possible for students to comment on entries in a database (or even to contribute entries themselves), or to work collaboratively’ (Wikipedia, 2007). This philosophy ‘believes that people learn best when they interact with the learning material, construct new material from others and interact with other students about the material . . . the difference between a traditional class and the social constructionist philosophy is the difference between a lecture and a discussion’ (Rice, 2006, P. 9).

3. Using Moodle

The availability of Moodle provided the opportunity to develop a resource package for the part time mature Financial Management students that would use a range of blended learning tools as standard components within Moodle. The aim was to allow these students a more varied learning experience, offer greater resource access to part-time students and introduce pedagogic changes to the Financial Management module to support wider skills development. The Financial Management module was modeled in Moodle using the calendar features and where the course resources would be stored in a structured manner coupled to new online links for further research. The three main Moodle tools selected as the basis for pedagogic improvements were quizzes, wikis and forums. It was decided that:

1. The quizzes would be made up from a new extensive question bank which will form the basis for the multiple choice questions which are of the same type as Section A of the module examination. Quizzes will be used as a revision tool at the end of every major topic, but also as a guide for the lecturer who can look at the results of the quiz and analyze them to see if there are any topics that need to be revised.

2. The wikis would be used to allow students to construct their own meaningful definitions store covering the major themes/models covered in each topic. It will also direct them to carry out extra reading and research to be shared amongst the group and provide a useful tool for discussion and revision purposes. The use of wikis was designed to shift the emphasis from tutor delivery, to students researching and verbalizing their own meanings, which would then be assessed both by the tutor and other students.

3. The Financial Management Module forum would provide the ability for students to share ideas, discuss issues and ask questions to the group. The plan was for the lecturer to check this regularly to identify and solve any issues that may arose.

4. Defining the dimensions of the blended learning development

Sharpe et al (2006) saw that the lack of formal definition for ‘blended learning’ as one of its advantages. Instead of providing a precise definition of blended learning, a set of eight generic defining dimensions were proposed and it provides a systematic way of describing and positioning any implementation of blended learning. Using this dimensions approach, the differences between the original traditional Financial Management Module and the developed blended learning based module are shown at Table 1.
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Table 1: Financial management module (University of Winchester) blended learning dimensions (After Sharpe et al (2006))

<table>
<thead>
<tr>
<th>Blended Learning Dimensions</th>
<th>Original Traditional Teaching Approach</th>
<th>Target Blended Learning Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delivery</td>
<td>Face to face classroom instruction of theory and methods.</td>
<td>Face to face classroom instruction maintained, but supported with IT based resources. Resource package developed in Moodle (wikis, quizzes, journals, forums) PowerPoint and Word documents covering course material. Reference list now included. (Delivery Developed)</td>
</tr>
<tr>
<td>Technology</td>
<td>Use of the VLE. Static course notes and PowerPoint presentations available.</td>
<td>Use of existing VLE and Moodle to post structured interactive material enriched with static notes, papers, Internet links and PowerPoint material. Students have started to use online. (Developed – but awaits full Moodle implementation by the University)</td>
</tr>
<tr>
<td>Chronology</td>
<td>Formal structured synchronous presentation of material.</td>
<td>Formal structured synchronous presentation of material. Retain a chronology. Presentation method has continued to provide stable organized core of learning materials for set student attendance periods. (Developed)</td>
</tr>
<tr>
<td>Locus</td>
<td>Classroom based learning using worksheet and practice questions.</td>
<td>Classroom/IT suite based using worksheets and IT based interactive questions and tools. New worksheets developed and presented using Moodle. Question Item Bank now included. Interactive worksheets under development. Allows constructive breaks with formal lectures and where students can carry on in their own time things they stared in class. (Under Development)</td>
</tr>
<tr>
<td>Roles</td>
<td>BAMA students only</td>
<td>No change.</td>
</tr>
<tr>
<td>Pedagogy</td>
<td>Limited pedagogical approach with no matching to the problems of mature part-time students.</td>
<td>Attempting to match pedagogic approach to mature part time students. All material is online. Interactive tests with results can be carried in students own time</td>
</tr>
<tr>
<td>Focus</td>
<td>Singular focused aim of passing examination.</td>
<td>Dual aim passing examination, wider interest in the subject and improving IT skills (Improving IT skills still underdevelopment)</td>
</tr>
<tr>
<td>Direction</td>
<td>Tutor led programme.</td>
<td>Tutor led programme, but increased emphasis on personal research and sharing/reviewing information with other students using IT tools. (Under development)</td>
</tr>
</tbody>
</table>

5. The learning and teaching development strategy

Salmon (2003) provides a 5 stage model for the design and implementation of learning and teaching online. It proposes the creation of a multi-stage environment with increasing levels of student interaction at each stage. Each stage requires participants to master certain technical skills and calls for different e-moderating skills. This model is useful in structuring an approach to blended learning and has been adopted as a basis for designing this case study. The 5 Stage Model assumes much intensive work at the beginning of a period of study making sure students are happy with the various media. Thomas (2007) outlined some of the factors that are involved with reaching the higher Salmon model stages and these are:

- Use of regular meetings.
- Rapid movement through the socialization stages.
- Regular participation.
- Agreed success criteria and evaluation.
- Model of teaching and learning online.

The 5 stage development model was used to provide a framework for an operating approach using Moodle. The plan identified the different IT based resources to be used each week alongside traditional face to face teaching. The implementation concept for the blended learning module Financial Management module was based on the 5 stage Model and is summarized at Table 2.

**Table 2: Financial management module blended learning: teaching and learning strategy (after Salmon, 2003)**

<table>
<thead>
<tr>
<th>Learning Stages</th>
<th>Blended Learning Implementation Concept</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stage One: Access and Motivation</strong></td>
<td>Making sure that individuals have access to online materials and have ability to participate online</td>
</tr>
<tr>
<td>First lecture.</td>
<td>Students are shown the Moodle Home Page and the different resources open to them.</td>
</tr>
<tr>
<td></td>
<td>Students given their passwords and user names.</td>
</tr>
<tr>
<td></td>
<td>Students start using quizzes.</td>
</tr>
<tr>
<td><strong>Stage Two: Online Socializing</strong></td>
<td>Participants establish online identities, interacting with others</td>
</tr>
<tr>
<td></td>
<td>The students use Moodle to provide an interesting change of resources from the traditional teaching.</td>
</tr>
<tr>
<td></td>
<td>The students work in small groups to create wiki definitions for topics that have been discussed within class. At the end of the workshop the entire class discusses the Wikis.</td>
</tr>
<tr>
<td><strong>Stage Three: Information Exchange</strong></td>
<td>Relevant information for the course being passed in between students</td>
</tr>
<tr>
<td></td>
<td>Students discuss problems online with tutor and other students.</td>
</tr>
<tr>
<td><strong>Stage Four: Knowledge Construction</strong></td>
<td>Social collaboration and class discussions</td>
</tr>
<tr>
<td></td>
<td>Moodle used more intensively as student wish to have more access to resources and are becoming more aware of the imposing assignment and examination.</td>
</tr>
<tr>
<td><strong>Stage Five: Development</strong></td>
<td>Participants look for more benefits from the system to help achieve personal goals</td>
</tr>
<tr>
<td></td>
<td>It is unlikely that the students will reach this stage within the module due to the short time frame but it provided an introduction to blended learning for the students. The majority has modules to undertake next year and so they may reach Stage 5 later. True knowledge constructions are very difficult to achieve in any environment and is particularly hard online (Salmon, 2003).</td>
</tr>
</tbody>
</table>

Table 3 illustrates the Financial Management module Implementation Plan which follows the teaching and learning strategy of the 5 Stage Model. The Implementation Plan shows how topics of shareholder value, investment appraisal and business finance are distributed as themes through the module and how Moodle is to be used at each formal stage. The Implementation Plan identifies the different IT based resources to be used each week alongside traditional face to face teaching and students’ own online studies.

### 6. Evaluation and findings of the case study

This Case Study has provided the opportunity to reflect on current practice and the pedagogic reasons for the design and presentation of a module for an important subject which students find difficult and dislike. It has also provided an opportunity to introduce a blended learning approach and to start to determine its effectiveness. Unfortunately, the student cohorts are small at 10 students each and the module is only repeated on an annual basis. This frequency and low population makes it difficult to provide objective measures to evaluate the effectiveness of the blended learning approach however the findings so far are:

#### 6.1 Impact of blended learning approach on the teaching and learning issues

The main driver for the introduction of a blended learning approach had been that the assignment and examination marks of part-time students were notably lower than those achieved by the full-time students. The first results from the blended learning approach have shown that marks from assessments for the part-time students are now on average about 8% higher.
**Table 3:** Financial module blended learning: teaching and learning strategy implementation summary *after Salmon, 2003*

<table>
<thead>
<tr>
<th>Financial Management Module Formal Study Periods</th>
<th>Teaching &amp; Learning Strategy Stages</th>
<th>Moodle Based Work</th>
<th>Student Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Formal Period 1</strong> (3 hours) Introduction to Financial Management</td>
<td>Stage 1 Access &amp; Motivation</td>
<td>Access &amp; Options Concepts of Wikis</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Formal Period 2</strong> (3 hours) Shareholder Value Analysis</td>
<td>Stage 2 (Initial) Online Socialization</td>
<td>Develop 'Shareholder Value' Wiki set Use of online quizzes Use Worksheets</td>
<td>Moodle Online quiz ‘Shareholder Value’</td>
</tr>
<tr>
<td></td>
<td>Stage 3 Information Exchange</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Formal Period 3</strong> (6 hours) Investment Appraisal</td>
<td></td>
<td>Use Moodle Review Wikis Use Worksheets Start ‘Investment Appraisal’ Wiki set Use online forums Use information exchange</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Stage 2 Online Socialization</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Stage 3 Information Exchange</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Formal Period 4</strong> (3 hours) Investment Appraisal</td>
<td></td>
<td>Use Worksheets Finish ‘Investment Appraisal’ Wiki set</td>
<td>Moodle Online quiz ‘Investment Appraisal’</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Formal Period 5</strong> (3 hours) Business Finance – Sources of Finance</td>
<td>Stage 4 Knowledge Construction</td>
<td>Use Worksheets Start ‘Business Finance’ Wiki set</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Formal Period 6</strong> (3 hours) Business Finance – Cost of Capital</td>
<td>Use Worksheets</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Formal Period 8</strong> (3 hours) Revision</td>
<td>Stage 5 Development</td>
<td>Use Worksheets</td>
<td>Online Quizzes BS3906 Financial Management Examination</td>
</tr>
</tbody>
</table>

Many part-time students had previously requested extension concessions for their assignment and the examination due to work/personal life problems. 5 students (50%) requested extensions in the previous conventional course, whereas only 1 student asked for the concession following the blended learning course. There were a number of part-time students who missed classes because of commitments and who were unhappy about having to do so. Part-time students still miss classes – but the anecdotal evidence is that students are now less anxious, because they know all the course material and self-assessment work are available in a structured way via Moodle. Part-time students expressed anxiety about the difficulty of studying Financial Management and that they lacked the time to study with the intensity that the module guidelines required. Unfortunately part-time students, although now less anxious about the Financial Management module, are still concerned about its intensity and still lack confidence about the mathematical components.

### 6.2 Teaching and learning strategy

It was a quick and easy exercise to establish the structure of the blended learning course in Moodle according to the selected teaching and learning strategy following the Salmon 5 Stage Model. This model proved to be a useful guide to establishing a positive student response to the blended learning approach and to providing a target development structure for the students. Students worked through the planned Stages 1-4 efficiently and within the periods as planned. As identified by Thomas (2007), regular meetings (sessions), rapid movement through the socialization stages, regular participation, agreed success criteria and
evaluation, and a clear model of teaching and learning online contributed to the early success of the blended learning approach for the revised Financial Management module. However, as predicted the Financial Management module is not of sufficient length or diversity for students to migrate to the planned Stage 5: Development, where the emphasis is on achieving personal goals. However, the students are now well prepared for other modules which will use blended learning approaches later in their course.

6.3 Using Moodle

Students liked the structure and availability of Moodle. They found the quizzes with immediate feedback to be effective and motivating. In general, the students wanted more quiz material and access to more online links. However, like Kirkpatrick (2006), it was found there was poor take up of the online ‘public’ forum facility. While Stage 3 of the Learning and Teaching Strategy was focused on information exchange, students wanted to take individual email addresses, so they could email each other privately. Additionally, the tutor was still receiving individual emails concerning queries, rather than via the forum. The reasons for this are unclear and it may be that better explanation of the forum facility and the restriction in the use of email with the tutor might provide some improvement.

6.4 Evaluation questionnaire

It was found that during the blended learning courses students started to use the Internet at home and work to support their studies with a dramatic shift to the use of the University’s VLE and Moodle. Whereas 50% of students had previously reported a low level of IT knowledge during the conventional course, at the end of the blended learning course most students reported a ‘medium’ or higher level of IT knowledge and skills. There was also an apparent shift in the preferences of students towards using various learning methods. Because of the low numbers of students involved some care must be taken in interpreting these results, however Table 4 shows that the new methods were received favorably. The dislike of using online discussion forums needs further investigation.

Table 4: Bamba part-time students teaching/learning methods preferences (Not all respondents completed all lines in their evaluation questionnaires)

<table>
<thead>
<tr>
<th>Usage</th>
<th>Methods</th>
<th>Prefer</th>
<th>Satisfactory</th>
<th>Dislike</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methods Still Used</td>
<td>Classroom Discussions</td>
<td>60%</td>
<td>30%</td>
<td>10%</td>
</tr>
<tr>
<td></td>
<td>Directed Reading</td>
<td>30%</td>
<td>60%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Essay Writing</td>
<td>40%</td>
<td>60%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Group Work</td>
<td>70%</td>
<td>20%</td>
<td>10%</td>
</tr>
<tr>
<td></td>
<td>Individual Tutorials</td>
<td>50%</td>
<td>10%</td>
<td>20%</td>
</tr>
<tr>
<td></td>
<td>Lectures</td>
<td>80%</td>
<td>20%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Self Study - Text books</td>
<td>20%</td>
<td>70%</td>
<td>10%</td>
</tr>
<tr>
<td></td>
<td>Self Study - Worksheets</td>
<td>30%</td>
<td>70%</td>
<td></td>
</tr>
<tr>
<td>Recently Introduced Methods</td>
<td>Computer Based Exercises</td>
<td>60%</td>
<td>30%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Links to other websites and further reading</td>
<td>40%</td>
<td>30%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>On-line discussion forums</td>
<td>20%</td>
<td>40%</td>
<td>30%</td>
</tr>
<tr>
<td>Future Methods</td>
<td>Project work instead of examinations</td>
<td>50%</td>
<td>40%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Self study using the VLE and Moodle</td>
<td>50%</td>
<td>40%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Computer based assessments</td>
<td>30%</td>
<td>40%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Developing financial models in a spreadsheet</td>
<td>50%</td>
<td>20%</td>
<td>20%</td>
</tr>
<tr>
<td></td>
<td>Self study using computer financial exercises</td>
<td>40%</td>
<td>30%</td>
<td>10%</td>
</tr>
<tr>
<td></td>
<td>Seminars (selected students present topics)</td>
<td>50%</td>
<td>40%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Simulations using financial models</td>
<td>20%</td>
<td>70%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The use of pre-course reading material</td>
<td>10%</td>
<td>80%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Use of distance learning materials</td>
<td>20%</td>
<td>60%</td>
<td>10%</td>
</tr>
<tr>
<td></td>
<td>Use of real problems from the workplace</td>
<td>50%</td>
<td>40%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Using computer based learning packages</td>
<td>10%</td>
<td>50%</td>
<td>20%</td>
</tr>
<tr>
<td></td>
<td>Work-based and Experience Learning</td>
<td>20%</td>
<td>50%</td>
<td>20%</td>
</tr>
</tbody>
</table>

Overall, the blended learning approach described in this paper has had some success in managing the issues of part-time students studying a subject which is perceived to be difficult. This success was supported
by the timely availability of Moodle, which provided a sound platform for the development and the adoption of a teaching and learning strategy for clear direction and an achievable target.

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Engaging the YouTube Google-Eyed Generation: Strategies for Using Web 2.0 in Teaching and Learning

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Abstract: YouTube, Podcasting, Blogs, Wikis and RSS are buzz words currently associated with the term Web 2.0 and represent a shifting pedagogical paradigm for the use of a new set of tools within education.

The implication here is a possible shift from the basic archetypical vehicles used for (e)learning today (lecture notes, printed material, PowerPoint, websites, animation) towards a ubiquitous user-centric, user-content generated and user-guided experience.

It is not sufficient to use online learning and teaching technologies simply for the delivery of content to students. A new “Learning Ecology” is present where these Web 2.0 technologies can be explored for collaborative and (co)creative purposes as well as for the critical assessment, evaluation and personalization of information.

Web 2.0 technologies provide educators with many possibilities for engaging students in desirable practices such as collaborative content creation, peer assessment and motivation of students through innovative use of media. These can be used in the development of authentic learning tasks and enhance the learning experience.

However in order for a new learning tool, be it print, multimedia, blog, podcast or video, to be adopted, educators must be able to conceptualize the possibilities for use within a concrete framework. This paper outlines some possible strategies for educators to incorporate the use of some of these Web 2.0 technologies into the student learning experience.

Keywords: Web 2.0, e-Learning, YouTube, blog, Wiki

1. Introduction

Why should the notion of incorporating Web 2.0 and interacting with for example socially distributed and user-created videos (e.g. from www.youtube.com) be important within education? In what ways has the rapid development of digital technologies associated with the term Web 2.0 and their use in education enabled individuals to interact differently within existing ecologies of learning? How can we as educators engage the YouTube, Google-eyed generation?

Students today have grown up within a world of pervasive technology including mobile phones, digital cameras and the omnipresent internet. Described as, “Gen-X, Millennials, the Nintendo and Net Generation” (Tapscott, 1997; Oblinger, 2003; Olsen, 2005), these students blog, play games in immersive 3-D worlds, listen to podcasts, instant message friends, listen to music, author their own video for www.youtube.com and collaborate on the creation of ‘digital stories’ for their ePortfolio. They absorb information quickly, in images and video as well as text, from multiple sources simultaneously. They operate at what Prensky (2004) describes as, “twitch speed”, expecting instant responses and feedback. They prefer random “on-demand” access to media; expect to be in constant communication with their friends and ease of access in the creation of their own content.

In his article, Growing Up Digital: How the Web Changes Work, Education, and the Ways People Learn, John Seely Brown (2002) uses ecology as a metaphor to describe an environment for learning. Brown says, “An ecology is basically an open, complex adaptive system comprising elements that are dynamic and interdependent. One of the things that make an ecology so powerful and adaptable to new contexts is its diversity.” Brown further describes a learning ecology as, “a collection of overlapping communities of interest (virtual), cross-pollinating with each other, constantly evolving, and largely self-organizing.”

New Web 2.0 technologies and websites, such as a blog, wiki or YouTube, make new demands on learning, and they provide new supports to learning, even as they also dismantle some of the learning supports upon which education has depended in the past. If we agree that there are changes occurring across the learning ecology and, that new conceptualisations are required to use these emerging technologies, then some care should be taken to think deeply about the impacts of Web 2.0 on the processes and practices of pedagogy.
The focus of this paper will be on a pragmatic exploration of blogs, YouTube and wikis as illustrative and typical examples of technologies and websites that reflect the changing landscape of our Web 2.0 learning ecology. Clearly, the choice of these three areas does not delimit the categorisation of Web 2.0 tools to only these three, and other areas such as Virtual Worlds / aka Second Life (http://www.secondlife.com/) or social sharing sites such as Face-book (http://www.facebook.com/) or, Myspace (http://www.myspace.com/), etc could be dealt with, however, by limiting the choice within this paper to an exploration of blogs, YouTube and wikis as illustrative of Web 2.0 it is envisaged that this will provide some starting frames of reference within which to consider strategies for using Web 2.0 within teaching and learning for the reader. Explored will initially be definitional aspects of Web 2.0 and a general understanding of Web 2.0 before delving into a detailed focus on some possible strategies for educators to incorporate the use of blogs, YouTube and wikis (as representative of Web 2.0) into the student learning experience.

2. A student context

Why would the notion of incorporating user-created videos (e.g. from www.youtube.com as one illustrative example of Web 2.0) be important within education? From a student perspective we must reflect on the changing nature of our students as key stakeholders in the educational process. Sometimes called “digital natives” or the “Nintendo generation”, these new millennials approach work, recreation and certainly education in new ways. (Tapscott, 1997) They absorb information quickly, in images and video as well as text, from multiple sources simultaneously. They operate at what Prensky (2004) describes as, “twitch speed”, expecting instant responses and feedback. They prefer random “on-demand” access to media; expect to be in constant communication with their friends and ease of access in the creation of their own new media.

There is some debate about students’ ability to transfer these technological ‘real world’ skills to an academic context (refer for example to The ECAR Study of Undergraduate Students and Information Technology, released in December 2006. But certainly not debated is the dominance and pervasive use of the technology by students. According to an American study on teen content creators and consumers, (Lenhard & Madden, 2005), 57% of online teens create content for the Internet. That amounts to half of all teens ages 12–17, or about 12 million youth. The study referred to students being involved in the following activities: create a blog; create or work on a personal web-page; create or work on a webpage for school, a friend, or an organization; share original content such as artwork, photos, stories, or videos online; or remix content found online into a new creation. In learning, these trends are manifest in what is sometimes called “learner-centered” or “student-centered” design (Marzano, 2006). This is however, more than an adaptation to accommodate different learning styles or allowing the user to change the display of a website; it is the placing of the control of learning experience itself into the hands of the learner. The phenomena of Web 2.0 provide for students an unprecedented way to access, socialize and co-create.

3. Web 2.0

“Web 2.0”, a phrase coined by O’Reilly Media in 2003 (O’Reilly, 2005), refers to a perceived second generation of web-based interactions, applications and communities. It is considered to be inclusive of a shift from a World Wide Web that is “read only” to a Web that is being described as the “Read Write Web” (Gillmor, 2007). Instead of content that was for the most part static, we are now seeing the ability to remix content in different ways, in order to suit contextual needs. The Web is evolving to become more like an area for social and idea networking. Students negotiate meanings and connections within Web 2.0 social spaces or idea networks, exchange bits of content, create new content, and collaborate in new ways.

The term Web 2.0 has been applied to a heterogeneous mix of the familiar with the innovative and emergent and as such can be considered problematic in a definitional sense. What must be considered here though is not the shifting ground in relation to definitional aspects of Web 2.0 but how the term is defined for the purposes of this exploration of its use within education and pedagogic possibilities? As Alexander, (2006, p.32) states, “Ultimately, the label “Web 2.0” is far less important than the concepts, projects, and practices included in its scope”.

Presented here are some broad characteristics of a Web 2.0 web-site in order to further delimit the term for the reader;

- "network as platform”; delivering (and allowing users to use) applications entirely through an internet browser
- users own the content on a site and exercise control over it
**an architecture of participation that encourages users to contribute**

- a rich, interactive, user-friendly interface

- social-networking functions

In summary, O’Reilly (2005) indicates that, "Web 2.0" stands for the idea that the Internet is evolving from a collection of static pages into a vehicle for software services, especially those that foster self-publishing, participation, and collaboration.

User-centered Web 2.0 phenomena such as blogging, social video sharing (exemplified by YouTube) and collective editing (wiki or Wikipedia as an example) are disrupting traditional ideas about how students interact online and how content is generated, shared, and distributed. Presented next are some specific characteristics of blogs, YouTube and wikis as well as, educational benefits and strategies for the educational use of each.

**Examples of Web 2.0**

Tim O’Reilly (2005) provides a comparison between websites and functions that typically illustrate Web 1.0 and 2.0. In his initial brainstorming, he formulated the following examples and this initial list has been adapted to include some previous terms such as read-write web to provide further insight and a context for the reader in relation to these terms.

**Table 1: Comparison of Web 1.0 to Web 2.0**

<table>
<thead>
<tr>
<th>Web 1.0</th>
<th>Web 2.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>DoubleClick</td>
<td>Google AdSense</td>
</tr>
<tr>
<td>Ofoto</td>
<td>Flickr</td>
</tr>
<tr>
<td>Akamai</td>
<td>BitTorrent</td>
</tr>
<tr>
<td>mp3.com</td>
<td>Napster / Podcasting</td>
</tr>
<tr>
<td>Britannica Online</td>
<td>Wikipedia</td>
</tr>
<tr>
<td>personal websites</td>
<td>blogging</td>
</tr>
<tr>
<td>evite</td>
<td>upcoming.org and EVDB</td>
</tr>
<tr>
<td>domain name speculation</td>
<td>search engine optimization</td>
</tr>
<tr>
<td>page views</td>
<td>cost per click</td>
</tr>
<tr>
<td>screen scraping</td>
<td>web services</td>
</tr>
<tr>
<td>publishing</td>
<td>participation</td>
</tr>
<tr>
<td>content management systems</td>
<td>wikis</td>
</tr>
<tr>
<td>directories (taxonomy)</td>
<td>tagging (&quot;folksonomy&quot;)</td>
</tr>
<tr>
<td>stickiness</td>
<td>RSS - syndication</td>
</tr>
<tr>
<td>Read Web</td>
<td>Read-Write Web</td>
</tr>
<tr>
<td>Linear</td>
<td>Non-Linear</td>
</tr>
<tr>
<td>Daily ME</td>
<td>Daily WE</td>
</tr>
<tr>
<td>Old Media</td>
<td>New Media / or Social Media</td>
</tr>
</tbody>
</table>

(This table has been adapted from http://www.oreillynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html)

Some of the terms above may be problematic for the novice Web 2.0 reader and so a brief description of some of the more common terms is provided. Blogs provide a personal commentary or news on a particular subject and many function as a personal online diary. A typical blog combines text, images, and links to other blogs and web media. The ability for readers to leave comments in an interactive format is an important part of many blogs. Blogging is content created from a personal point of view, in a personal voice. A wiki (sometimes wiki wiki) is a web application designed to allow multiple authors to add, remove, and edit content. (Cunningham and Leuf; (2001). The multiple author capability of wikis makes them effective tools for mass collaborative authoring. Wikipedia, is one of the best known wikis. RSS, folksonomies and tagging are often part of the transformation to the “Read Write Web.” The term folksonomy (derived from "folk" and "taxonomy") was coined by Thomas VanderWal (Vanderwal, 2006) and refers to a form of organic categorization that comes from internet users as they encounter new information. Podcasting, is the creation and distribution of an audio or more recently video recording online. It is distributed over the internet using RSS or syndication feeds and is often suitable for playback on portable players such as an iPod.

Various ‘social’ new media sharing websites have become associated with the term Web 2.0 as well. Photo-sharing Web sites such as Flickr, (www.flickr.com) are becoming hubs for students sharing photos. In addition to being a popular Web site for users to share personal photographs, the service is widely used by...
bloggers as a photo repository. Its popularity has been fueled by its innovative online community tools that allow photos to be tagged and browsed by folksonomic means. Video-sharing websites continue to proliferate on the internet. The article “The ultimate Online Video List”, indicates 210 different online video sites. (refer to http://www.everybodygoto.com/2007/05/21/the-ultimate-online-video-list/). At present the website with the largest market share is www.youtube.com and it is this site that we will be focusing on in relation to new media and an exploration of specific strategies to use YouTube in teaching and learning.

4. What is a blog?
Paquet (2003) refers to the term, blog, initiated by Barger in 1997, as a log of the Web – or Weblog. In its simplest form it is a Website with dated entries, presented in reverse chronological order and published on the Internet. The word blog is both a noun and a verb. People who maintain a blog are called bloggers. The act of posting to a blog is called blogging and the distributed, collective, and interlinked world of blogging is the blogosphere.

4.1 Characteristics of a blog
A Weblog or blog can be described as an online journal with one or many contributors. Besides straight text and hyperlinks, many blogs incorporate other forms of media, such as images and video.

Blogs differ from traditional websites and provide many advantages over traditional sites, including:
- easy creation of new pages, since new data is entered into a blog usually through a simple form and then submitted with the blogger (or person adding the entry to the blog website) updating the blog with little or no technical background - blogs have thus become the novice's Web authoring tool;
- filtering of content for various blog entries, for example by date, category, author, or one of many other attributes;
- most blog platforms allow the blog administrator to invite and add other authors, whose permissions for creating content and access are easily managed;
- providing a personal writing space that is easy to use, sharable, and automatically archived;
- ability to link and inter-link to form learning communities;
- opportunity to serve as a digital portfolios of students' assignments and achievements;
- extensions into fully-featured content management systems

4.2 Educational benefits of blogs
Potential benefits as identified by learning specialists Fernette and Brock Eide and cited by Will Richardson (2006) in Blogs, Wikis, Podcasts, and Other Powerful Webtools for Classrooms include the following:
- can promote critical and analytical thinking;
- can promote creative, intuitive and associational thinking;
- (creative and associational thinking in relation to blogs being used as a brainstorming tool and also as a resource for interlinking, commenting on interlinked ideas);
- can promote analogical thinking;
- potential for increased access and exposure to quality information;
- combination of solitary and social interaction

Within the structure of a blog, students can demonstrate critical thinking, take creative risks, and make sophisticated use of language and design elements. In doing so, the students acquire creative, critical, communicative, and collaborative skills that may be useful to them in both scholarly and professional contexts. The growing popularity of blogs suggests the possibility that some of the work that students need to do in order to read well, respond critically, and write vigorously, might be accomplished under circumstances dramatically different from those currently utilized in education.

4.3 Strategies for using blogs in teaching and learning
The following are some possible uses of blogs in education:
Within a personal academic perspective a blog can support;
- reflection on teaching experiences;
- categorized descriptions of resources and methodologies for teaching;
- ramblings regarding professional challenges and teaching tips for other academics, and
- illustration of specific technology-related tips for other colleagues

Within an organizational perspective a blog can support;
- a common online presence for unit-related information such as calendars, events, assignments and resources, and an
- online area for students to post contact details and queries relating to assessment

Within a pedagogical perspective a blog can support;
- comments based on content, literature readings and student responses;
- a collaborative space for students to act as reviewers for course-related materials;
- images and reflections related to industry placement;
- an online gallery space for review of works, writings, etc., in progress, making use especially of the commenting feature;
- teachers encouraging reactions, reflections and ideas by commenting on their students’ blogs, and
- the development of a student portfolio of work

4.4 Further questions to be explored

Consider asking your students how much reflective writing they do? Then, for comparison, ask them how much time they spend writing emails, using ICQ or MSN Messenger, and surfing the Internet? Most will be heavily involved in the latter. To the current generation of students, the Internet and other forms of electronic discourse are not necessarily associated with their concept of “reading and writing” in an educational sense, but rather are tools for social interaction. Blogging, as a socially driven public written reflection, can change the dynamic of teaching rhetorical sensitivity and reflection. Many students are already highly socially active in Internet-based environments, interacting with and commenting on one another’s written materials – even without formally realising that they are doing so. The proclivity and popularity of Websites such as the video sharing site www.youtube.com and the blogging space www.blogger.com indicate a growing impetus towards personal expression and reflection, and the sharing of “personal” spaces.

5. What is YouTube?

YouTube is a popular video sharing website where users can upload, view, and share video clips. YouTube has become an enormously popular form of web 2.0 new media. A recent article in Wired cites an average of 65,000 uploads and 100 million videos viewed per day on YouTube (Godwin-Jones, 2007).

5.1 Characteristics of YouTube

A typical YouTube webpage is usually made up of the following components:
- the wide variety of video content including movie and TV clips and music videos, as well as amateur content such as video blogging and short original videos;
- unregistered users can watch most videos on the site; registered users have the ability to upload an unlimited number of videos;
- Flag – ability to indicate a video that has inappropriate content;
- Title - main title of the video;
- Tags – keywords specified by the person who has uploaded the video;
- Channels – relating to groupings of content;
- Related videos - determined by the title and tags, appear to the right of the video;
- Subscribe – registered users can subscribe to content feeds for a particular user or users;
• Comments – often not monitored can be provided by any registered user about a video uploaded;
• Views – the number of times a video has been watched;
• Rating - videos can be rated by registered users

5.2 Educational benefits of YouTube

Video can be a powerful educational and motivational tool. However, a great deal of the medium's power lies not in itself but in how it is used. Video is not an end in itself but a means toward achieving learning goals and objectives. Effective instructional video is not television-to-student instruction but rather teacher-to-student instruction, with video as a vehicle for discovery.

YouTube is increasingly being used by educators as a pedagogic resource for everything from newsworthy events from around the world to "slice-of-life" videos used to teach students within an ESL (English as a Second Language) course. From instructional videos to an online space to share student authored content.

Some general guidelines recommended by Clark and Mayer (2002) in relation to considering the appropriate use of any media to improve learning suggest that media must;
• be aligned with expected learning or performance outcome;
• reduce cognitive load;
• exclude superficial text or graphics;
• be appropriate for target learner's learning literacy's

Educators (and students alike), will find that video is an effective catalyst and facilitator for classroom discourse and analysis.

5.3 Strategies for using YouTube in teaching and learning

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Video learning shouldn’t be passive. These are some guidelines relating to the specific use of video to promote active viewing and maximize learning;
1. SEGEMENT - allow your students to watch the video in short segments
2. NOTES - videos are ideal for developing note-taking skills. Take notes on the first viewing, then rewind, replay and check them. This can be done individually or collectively as a class discussion / brainstorming session.
3. PAUSE - Use the "pause" feature to temporarily stop the tape and allow your students to try to predict/recall what will happen next.
4. SOUND OFF - for video sequences that rely on visuals, turn the sound off and narrate. This technique works especially well for listing the steps of a process.
5. **PICTURE OFF** - use the audio clues to describe what is on screen. Compare and contrast the predictions with the actual video.

6. **PREVIEW** each video carefully to determine its suitability for the lesson's objectives and student's learning outcomes.

7. **INTEGRATE** the video into the overall learning experience by adding an experimental component to the lesson. Activities can be done prior to viewing; to set the stage, review, provide background information, identify new vocabulary words, or to introduce the topic. The activity can be done after viewing to reinforce, apply, or extend the information conveyed by the program. Often the video can serve as an introduction or motivator for the hands-on activity to come.

8. **CUT** – use online video editors like www.cuts.com or www.eyespot.com to capture the concepts that are most relevant for your lesson topic. It is often unnecessary and time-consuming to screen a program in its entirety. When previewing a program, look for segments particularly relevant or useful to the lesson or activity planned.

9. **FOCUS** - give students a specific responsibility while viewing. Introduce the video with a question, things to look for, unfamiliar vocabulary, or an activity that will make the program's content more clear or meaningful. By charging students with specific viewing responsibilities, teachers can keep students "on task" and direct the learning experience to the lesson's objectives. Be sure and follow-up during and after viewing the tape.

10. **AFTER** - when students have viewed the video consider; what interested them? What didn't they understand? How can you relate the program to their experiences and feelings? Ask the students to add comments/blog on the video. How can you validate and appreciate diverse reactions to the material?

Teachers and students alike will find that video is an effective catalyst and facilitator for classroom discourse and analysis. Coupled with hands-on learning, a new media, video-enhanced curriculum can be invaluable for expanding the learning experience and by incorporating a medium that is as popular, forceful and familiar; educators can tap into the existing enthusiasm towards this form of new media. (The above strategies were adapted from http://www.idahoptv.org/ntti/strategies.html and http://www.edb.utexas.edu/fieldexp/SampleSeminars/SampleSeminar11.php)

Below are some specific examples of approaches to incorporating YouTube into the teaching and learning experience:

- YouTube can be used to create a learning community where everyone has a voice, anyone can contribute, and the value lies equally within the creation of the content and the networks of learners that form around content discovered and shared. (adapted from Educause Learning Initiative, 2006);

- allow your students to create a short video as part of an assessment item instead of the traditional essay. Becoming involved in the creation of a video, “heightens a student's visual literacy, an important skill in today’s electronic culture” (Educause Learning Initiative, 2006);

- YouTube allows the learner to experiment in new media to convey information and knowledge. “Many educators believe that the act of creating content, in virtually any form, is a valuable learning exercise” (Educause Learning Initiative, 2006);

- record a video of a guest presenter relevant to your content and use the YouTube comments feature to generate some discussion;

- pose a question at the end of class that can be considered from distinct viewpoints and ask your students to search for 2-3 video references relating to the different perspectives. The use of video as a part of an anticipatory set to promote discussion can be useful tool to engage with an audience already enamoured with the YouTube phenomenon;

- the use of video also has several advantages over graphic and textual media. E.g.: portrayal of concepts involving motion, the alteration of space and time; the observation of dangerous processes in a safe environment; dramatization of historical and complex events; demonstration of sequential processes the viewer can pause and review (Misanchuk, Schwier & Boling, 1996);

- to support language learning, at the end of one of your classes, decide on a particular topic and ask your students to search for short videos on this topic to watch it and create a difficult vocabulary guide;
ask students to capture a series of video vignettes related to their work placement. This will provide a rich authentic resource both for current students and future use. One example this are the video vignettes described within Diane Skiba’s (2007) article, “Nursing Education 2.0 via YouTube;

within higher education Jenkins, (2007) describes the ‘YouNiversity’ and suggests an intellectual network where students interact not only with professors, but with industry and the community;

YouTube can be used as a virtual library to support classroom lectures by providing students with access to video clips. (Conway, 2006)

5.4 Further questions to be explored

YouTube is not necessary for good teaching, in the same way that wheeling a VCR into the classroom is not necessary. Within an examination of Web 2.0 sites such as YouTube and the discourses that frame their use educators should consider: how do we engage with these Web 2.0 technologies, and how do we teach students to think critically about their potential uses? How do video sharing sites such as YouTube reshape our participation in and out of the classroom? Such questions, of course, do not have simple answers. Suggested is that educators need to go beyond treating video sharing sites as only virtual libraries and instead emphasizes the features more aligned with Web 2.0 such as the role of social comments, video responses to existing content, flexible possibilities for collaborative assessment and other features of media sharing collaboration.

6. What is a Wiki?

A wiki is a group of Web pages that allows users to add content, similar to a discussion forum or blog, but also permits others (sometimes completely unrestrictedly) to edit the content (Arreguin, 2004). What distinguishes wikis from blogs, discussion fora, or other content management systems is that there is no inherent structure hard-coded: wiki pages can be interconnected and organized as required, and are not presented by default in a reverse-chronological, taxonomic-hierarchical, or any other predetermined order. In essence, the wiki offers a vast simplification of the process of creating HTML pages, and thus is a very effective way to build and exchange information through collaborative effort.

6.1 Characteristics of a Wiki

The following are some typical characteristics of a Wiki:

- where a blog is (usually) the writings of one person to be read by many, a wiki is a website that allows a user to add content, but also allows that content to be edited by any other user;
- they involve the creation of documents (individual pages as well as the entire wiki) without a detailed technical knowledge of HTML;
- they tend towards expressing ideas as relationships between pages, thus creating a network of interrelated topics;
- they are a-temporal, that is, the nodes (or interlinking textual references) change not according to time but by way of development within the evolving and edited text,
- they track the changes to individual pages over time;
- provides a space where knowledge becomes networked (situated, contextualized) but remains ephemeral: it changes, and can be changed and mediated by the community

6.2 Educational benefits of Wikis

In essence, wikis offer an online space for collaborative authorship and writing. They are available online for all Web users or for members of specific communities, and include version control tools that allow authors to track the history of specific pages, and the history of their personal contributions. Using wikis, students can easily create simple Websites without prior knowledge or skill programming in HTML or current software used for Website authoring, thus eliminating the time overhead necessary to develop these skills. Also, as more organisations adopt the wiki for internal and external collaboration and information, work with wikis at the tertiary level builds crucial skills for the workplace.

A wiki also offers the ability to interact with an evolving document over time. It allows teachers and learners to see the evolution of a written task, and to continually comment on it, rather than offering comments only
6.3 Strategies for using Wikis in teaching and learning

The following are some possible educational uses of a wiki:

- students can use a wiki to develop research projects, with the wiki acting as ongoing documentation of their work;
- a wiki can be used for students to add summaries of their thoughts from the prescribed readings, building a collaborative annotated bibliography;
- in distance learning environments, the tutor can publish course resources like syllabus and handouts, and students can edit and comment on these directly;
- wikis can be used as a knowledge base for teachers, enabling them to share reflections and thoughts regarding teaching practices and allowing for versioning and documentation;
- wikis can be used to map concepts: they are useful for brainstorming, and authoring a wiki on a given topic produces a linked network of resources;
- a wiki can be used to facilitate a presentation in place of conventional software, like Keynote and PowerPoint;
- wikis are tools for group authoring of a document;
- wikis are being used for course evaluation: students at Brown University have started CAW (n.d), the Course Advisor Wiki, a place for students to collaboratively write reviews of courses they've taken. CAW gives readers a flexibility to articulate their impressions, and enables richer reviews that combine multiple impressions and perspectives.

For a further exploration of some of these ideas, also see Pearce (2006), *Wikis in Education and Other Tools for Collaborative Writing* (2006), and *ExamplesWikiUse* (2006).

6.4 Further questions to be explored

Just as there are strengths in collaborative, co-authored online spaces there are also some challenges. Some wikis have no page locking system, so if two people edit the page simultaneously, one set of changes will be silently deleted. Some wikis do not include a versioning system, making them inappropriate for the task. Also, there are the social issues that occasionally crop up, particularly on very large projects such as the *Wikipedia*. Some pages on *Wikipedia*, dealing with controversial topics such as abortion or religious perspectives, can exhibit a phenomenon known as an “edit war” (Wikipedia, 2006). This is the continuous editing and re-visioning of content by a community member with a particular agenda. The easiest way to circumvent such disagreements is to place a block on the page edit functionality for a period of time.

Asking students to develop new wiki pages can present considerations from an educational perspective which are comparable to teaching students the processes of authorship in any other written task. Depending on the nature of the task at hand, wiki entries may be structurally and procedurally different from standard writing tasks that students may be already used to – therefore, it is important that teachers provide sufficient help and instruction to learners as they come to understand the requirements of the wiki writing genre.

7. Conclusion - An evolving learning ecology

Like the early days of the Internet, there is an optimism driving experimentation and exploration across the learning ecology presented by technology. Web 2.0 presents educators with shifting frames of reference to consider in relation to teaching and learning. Students and educators now have access to a ubiquitous learning environment where it’s possible to search for, locate, and quickly access elements of learning that address immediate needs. It is possible to use Web 2.0 technology to construct and organize personalized, unique interactions with an educational context.

The learning design and content elements that form a learning ecology must be dynamic and interdependent. The learning environment should enable instructional elements designed as small, highly relevant content objects to be dynamically reorganized into a variety of pedagogical models. This dynamic reorganization of content into different pedagogical models can create a learning system adaptive to varying student needs. Imagine for example, what could happen if our education curriculum operated more like Web
2.0, YouTube and Wikipedia, allowing for the rapid deployment of scattered expertise and the dynamic reconfiguration of content across contexts. Shifting conceptions of participation and connection for students could be explored and the contrast between ‘Push’ and ‘Pull’ Education (Richardson, 2005) can be mapped across this new learning ecology.

Richardson (2005) suggests that ‘Push’ models indicate students as passive whose needs can be anticipated and shaped by centralized decision-makers. ‘Pull’ models treat students as networked co-creators of media and are designed to accelerate capability building, helping students learn as well as innovate, by pursuing trajectories of learning that are tailored to their specific needs.

In part this shift from “Push” to “Pull” can be seen to relate to George Siemens's (2005) notion of Connectivism. Paraphrasing he indicates that, we derive our competence from forming connections.... unlike constructivism, which states that learners attempt to foster understanding by meaning-making tasks, this theory indicates that the meaning exists and the learner’s challenge is to recognize the patterns which appear to be hidden. Meaning-making is seen to involve forming connections between specialized communities and information / knowledge architectures.

Within higher education Jenkins, (2007) describes the ‘YouNiversity’ and suggests an intellectual network where students interact not only with professors, but with industry and the community thus encompassing a change in the traditional classroom learning ecology and inclusive of collaborative broader perspectives usually described within a blending of online with face-to-face learning experiences.

Within business the model suggested within ‘Wikinomics’ (Tapscott and Williams, 2006) indicates that open-source technology and strategies involving mass collaboration “changes everything”. That Web 2.0 tools such as wikis can be used successfully to enable tacit and other forms of knowledge to be shared. According to Tapscott, wikinomics is based on four ideas: Openness, Peering, Sharing, and Acting Globally. As educator’s considerations of how to translate these ideas into our teaching and learning challenge notions of authorship, intellectual property and ‘contingency’ and ‘technological imperative’ models (Orlikowski, 1992) for the integration of technology to support teaching or learning.

Challenged must be the ways in which our educational system is designed to “push” the limited resources it accessed previously. Explored should be ecologies of access to a plethora of knowledge and resources, and a rethink and expansion of the choices for our students to find those resources most relevant and effective. We need to teach them to take ownership of their own learning and to develop skills in media and information literacy. It is this close examination of Web 2.0 technologies and the discourses that frame their use that attracts the interest of many educators.

Which tools are used by learners and teachers, and whether such tools will be used at all, will always depend on the specific pedagogical needs of a teaching situation. Common to all of these technologies is that they are strongly social and community based. The Blogosphere offers ongoing distributed expression of and interaction with personal news, views, and ideas. Youtube’s popularity and authentic slice-of-life offers creative opportunities to share; respond to and author content. Wikis emphasise a more task-oriented collaborative editing of content and development of “collective” interlinked knowledge. The specific focus here on blogs, YouTube and wikis have presented for the reader some initial ideas in order to illustrate and prompt some thought in relation to the use of Web 2.0 technologies.

Such socially-based technologies sit well with the understanding of learning as socially constructed, which has been a cornerstone of recent pedagogical theory. Blogs, YouTube and wikis provide a means to encourage and make visible the social construction of knowledge which such theory postulates, and it is incumbent on teachers to embrace such tools where their use is beneficial to learners and teachers alike.

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e – Motional Learning in Primary Schools: FearNot! An Anti-bullying Intervention Based on Virtual Role-play with Intelligent Synthetic Characters

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Abstract: Addressing the problems of bullying in schools, this paper presents a novel and highly innovative pedagogical approach, building on the immersive power of virtual role-play. Educational role-play is widely accepted as a powerful instrument to change attitudes and behaviour, but faces some difficulties and disadvantages when applied to sensitive social issues in the classroom. This paper shows how the FearNot! software application, developed within the scope of the EU-funded projects VICTEC (Virtual ICT with Empathic Characters) and eCIRCUS (Education through Characters with emotional-intelligence and Role-playing Capabilities that Understand Social interaction) uses virtual role-play and autonomous agents to provide children aged eight to eleven years of age with the opportunity to visit a virtual school environment populated by 3D animated synthetic characters that engage in bullying episodes.

The characters’ actions and the storyline are created as improvised dramas by use of emergent narrative, resulting in unscripted and highly believable interaction experiences for the learner. While the students are spectators to the bullying episodes that unfold among the FearNot! characters, the victimised character starts a conversation with the student in between the episodes, describing their experiences with bullying and how they feel as a result to it, and asking the student for advice. The aim of this approach and particularly of this interaction sequence in between the virtual bullying episodes is to sensitise primary school students to the potential problems that victims of persistent aggressive behaviour are facing: By triggering an empathic relationship between learners and characters, learners understand and vicariously feel into the plight of the victimised character. Empirical evidence from bullying research implies that bullies are regularly reinforced by bystanders that witness the bullying and turn their attention to it, but do not actively intervene to end it (Craig & Pepler 1996; Lean 1998; Salmivalli 1999; Hawkins et al. 2001). Hence, this intervention strategy targets these bystanders to stand up to the bully and help the victim, due to their heightened awareness and sensitivity to the grave consequences victims face.

Preliminary evaluation results indicate that the children were willing to immerse themselves in the virtual drama and that they empathically engage with the characters, attributing a range of emotions to the characters depending on the events that happen within the respective scenario. An ongoing long-term intervention in school in the UK and Germany covers several interactions with the software over a ten week period of time.

Keywords: virtual environment, social and emotional learning, synthetic characters, bullying.

1. Introduction

Improvisational drama and role-taking exercises have been shown to enhance students’ personal and social development (Wright 2006). As a pedagogical means that is social and emotional in nature, role-play is seen as enhancing the ability to take over someone else’s perspective including thoughts, feelings and behaviour, and thus ultimately enhancing the ability to empathise.

By stepping outside one’s usual role and adopting others’ perspectives, ways of thinking, feeling and acting (empathic process) students gain a better understanding of the experiences of others (empathic outcome). While empathy can happen purely on the basis of observing the other and the situational context (e.g. while empathising with a real person in a social encounter) or of imagining their internal state (e.g. while
empathising with a fictional character in a book), it is facilitated by actively adopting the perspective of the other by taking over his/her role. Role-play can therefore be seen as a method to facilitate empathy in social interactions (Davis 1996).

Empathy is defined as comprising two aspects, one being affective in nature and focusing on the process of feeling something due to the perceived feelings/thoughts of a target person, and the other being cognitive and focusing on understanding feelings and thoughts of a target person. These processes produce affective (parallel affect, reactive affect) as well as non-affective (perceptual accuracy, attribution styles, behavioural tendencies) outcomes (see also Davis, 1996), all related to an observer’s internal simulation of a target person’s internal states.

One focus of the eCIRCUS project is to use the empathic process to get students to empathise with bullying victims. To achieve this goal, the virtual role-play approach provides a secure “as-if” framework for exploring experiences of self and other and ultimately to alter the students’ behaviour and attitudes in order to better match the challenges of social encounters in their day-to-day school environment. In attempting to help children with aggressive behaviour problems as well as socially insecure children, role-play has been successfully applied in school and therapeutic settings (Jupp & Griffiths 1990; Hungerige & Borg-Laufs 2001; Wright 2006), focusing on the holistic experience of another person: Even though behaviour is usually in the centre of role-play interventions, cognitions are also challenged by role-play as a side-effect of behavioural change and through reflection processes subsequent to the role-play (Hungerige & Borg-Laufs 2001). Another advantage of using role-play as an educational tool is that it allows for the learner to imaginatively leave the artificial classroom or therapeutic setting and act “as if” in real life situations (“prehearsal”, Kanfer 1979), but without exposing themselves to immediate feedback from real world interaction partners. Rather, the school or therapy setting offers a secure environment for the testing of new behavioural strategies that are immediately followed by professional feedback provided by educators, facilitators or therapists informing the role-player about the appropriateness of their actions. By acting out new roles, new schemas representing attitudes and actions develop within the role-player (Kelly 1955) and are differentially reinforced through immediate feedback in an encouraging and positive atmosphere. Ultimately role-play leads to more understanding of others’ experiences and also – occasionally – to a change of their own ways of thinking, feeling, and acting.

In social contexts, role-play helps at detecting and interpreting social stimuli and offers immediate reinforcement for appropriate social strategies, influencing the subjective evaluation of a student regarding his or her social skills and their social self-efficacy.

A crucial precondition for role-play to work as an educational tool is immersion: the learner is to stop thinking of themselves as students in a classroom, and take over their assigned identity for the duration of the role-play (see chapter 3.1 and 3.2).

However, some problems arise when applying role-play to school contexts: First, if immersion is to be achieved, role-play is a rather time-consuming and staff-intensive pedagogical tool which often clashes with the curriculum-driven reality in the classroom. Second, it involves groups of students that are involved in real-life social situations which might cause problems of stigmatisation, oppression and retaliation if role-play is applied to social conflict situations; in cases where there are latent or overt social conflicts between students in a class and educational staff is applying role-play techniques to address the problem, victimised students are less able to address their problems and anxieties publicly in front of the whole class, even more so if their perpetrators are present as well.

The approach presented in this paper suggests avoiding the negative implications of role-play as an educational tool by transferring it to a virtual environment, equipped with synthetic characters and providing the individual student with the possibility to engage in role-play in this virtual school setting. The approach is seen as particularly suitable for tackling sensitive social issues in the classroom, e.g. bullying.

2. Bullying

According to Olweus (1999), bullying can be described as follows: “A student is being bullied or victimised when he or she is exposed, repeatedly and over time, to negative actions on the part of one or more other students” (p. 9); it usually involves an imbalance in power between the bully (or bullies) and the victim that can be either real or perceived. Bullying can manifest itself in different behaviours: it can be direct verbal (blackmailing, shouting, calling names, etc.) or physical (hitting, kicking, punching, stealing, etc.) behaviour,
but also indirect behaviour targeted at the manipulation of social relations, e.g. spreading rumours or the deliberate ending of friendships (Björkqvist 1994; Wolke et al. 2000).

Bullying is an international problem. While aggressive behaviour is quite common in primary school, bullying in its combination of power abuse and long-term exertion is experienced by 10-15% (Pepler & Craig 2000) in an extent that makes them require support and intervention; while bullying is identified in various countries as a major problem among students (Norway, Sweden, Germany, Australia, Canada, UK, Japan, US, etc.), the figures vary to some extent due to differences in assessment methods and bullying definitions applied. Bullying is associated with concomitant phenomena for bullies and victims that range from delinquency, social exclusion and academic problems for bullies and anxiety, depression, somatisation problems, social exclusion, academic problems (concentration, refusal to go to school, eventually school dropout) for victims.

Interventions up to date concentrate on individuals, the class and the whole school. Many of them include programs for the educational staff and parents, curriculum material addressing the problem of bullying, strategies to make sure that students are monitored and a general plan or school policy to agree on standards in case bullying occurs. Meta-analyses on the effectiveness of bullying interventions (e.g. Smith, Pepler & Rigby 2004) have reported an average reduction in bullying after interventions of 15% at most, underlining the notion that new and innovative approaches are needed. One problem of existing intervention strategies is that the roles of the students involved are not differentially acknowledged and tackled. According to Salmivalli et al. (1999) students involved in bullying can be assigned to a participant role, e.g. not only bullies or victims, but also assistants to or reinforcements for the bully, bystanders who provide their attention and thus have reinforcing power, too, and defenders to the victim. Only very few students are real outsiders, and hence not involved at all in the bullying incident. With the software FearNot! application we aim at getting those involved who are either outsiders or bystanders, and try to raise the awareness of the bullying problem and eventually encourage them to become proactive when faced with bullying and take the side of the victim (Schäfer 1998; Batson 1991; Eisenberg & Miller 1987).

### 3. FearNot!

The EU funded project eCIRCUS (Education through Characters with emotional Intelligence and Role-playing Capabilities that Understand Social interaction) aims at applying educational role-play to bullying problems among primary school students featuring autonomous agents as social interaction partners. The software depicts bullying episodes between virtual characters in a virtual school, with the learner – who is interacting with the software individually – acting as a spectator during these bullying episodes. After each episode, the victimised character addresses the learner asking for help and advice regarding what he/she could do to end the bullying. The student engages in a conversation with the victimised character, acting as advisor and friend by suggesting coping strategies. In order to be of help, the learner is to think and feel into the situation of the victimised characters, understanding the plight of victims and eventually feeling their misery and desperation. Thus, while the learner is not directly part of the virtual role-play that is happening within the bullying episodes, he/she takes over the role of an off-stage “invisible friend” to the victimised character and can execute (limited) power over the storyline as the advice given to the victimised character affects its mental state (personality, emotional state, goals etc.) and thus ultimately the victimised character’s actions in the next episode. However, since the characters act according to their personality, emotional state, and goals in a given situation, the student’s input during the interaction sequence is only one determinant of the behaviour of the victimised character in the episodes to come. Hence, by being an active part of the story through counselling the victim, the student can affectively engage with what happens but at the same time benefits from the “as-if” mode of the virtual drama, being not involved themselves but being able to distance themselves when needed (Hall et al. 2005). Figure 1 shows a screenshot of the German version of FearNot! software depicting a bullying episode between Lukas (the bully) and Johannes (the victim).
As outlined above, role-play can be a powerful instrument to change attitudes and behaviour among children, if the precondition of immersion is met: students have to believe in the characters as really experiencing bullying, and they have to accept them as similar to themselves in how they experience it. Hence the effectiveness of the approach is directly linked to software development issues such as character design, narrative structure, and modelling of characters’ minds. In the following section, these issues are addressed.

3.1 Character design

3.1.1 Autonomy

Autonomous characters perceive information from the virtual environment and other characters, as well as from the interaction with the learner. They can also react flexibly to perceived changes in that environment and interact with other characters as well as with the learner. That does not necessarily mean that the character does not make mistakes in perceiving the environment or the actions of other characters or the learner; humans also make mistakes when they perceive their environment, even more so in complex social contexts. However, the character’s reactions to its perception should make sense for the learner who interacts with the character. In order to be able to react to perceived information in a way that allows for a believable and meaningful narrative to develop, characters need to incorporate an agent architecture that allows for selecting an action from an action repertoire (including language-based actions) according to a set of rules; furthermore, characters need to be capable to plan a sequence of actions in order to reach a long-term goal (Aylett 2006).

3.1.2 Expressivity

Bullying, as outlined in chapter 2, is a social problem among students that implies a wide variety of risks to the victims’ both long- and short-term social adaptation as well as emotional well-being. If the software aims at believably depicting the problem of bullying in schools, virtual characters enacting these bullying episodes need to be emotional by definition; this relates both to their behaviour that needs to be selected according to an emotional model that specifies emotional influence on action selection, and also to their expression of their emotional states. The latter is important if the learner is to understand the internal states of victims to bullying behaviour (cognitive empathy) and also if the learner is to be affected by the emotions that they perceive in the victim (affective empathy). The emotional expressivity of character actions is reflected in gestures and mimic, and in the tone of voice of the character.
3.2 Narrative structure / emergent narrative

The aim of the software FearNot! is to engage learners emotionally with the situation of victims to bullying in schools. How can this emotional engagement be fostered apart from how the characters look and behave? As has been outlined above, the learner has a certain control over the events by interacting with the victimised character and thus influencing – to a certain degree – its decisions in the bullying episodes to come. However, this influence can only be partial, since the characters act autonomously in creating the story. This highly flexible real-time storytelling approach that has previously been termed “emergent narrative” (Aylett 1999) results in a highly believable experience for the learner. In contrast to a script-based approach, the learner is provided with a complex and engaging virtual space inhabited with intelligent agents that accept or do not accept his/her suggestions, just like in real life. On the one hand, the autonomy of the characters and their role is creating a believable and realistic story about bullying; on the other hand, handing over control solely to autonomous characters and their interactions with one another and the learner poses some risk: how can one prevent the characters and their autonomously unfolding behaviour to oppose or hinder the educational goals, that is how can one ensure, even though the control of what happens next in the story lies with the characters and their decisions made in real-time, a believable, meaningful and appropriate (in the sense of the educational goal) learning experience for the learner?

3.3 Modelling agent minds

As outlined in section 3.2, the FearNot! characters need to meet some basic challenges in order for the software to fulfil the educational goal. First of all, all relevant objects, events, and other agents that exist in the virtual environment must be perceived and appraised regarding their significance for the emotional state of the character. Our realisation of the appraisal mechanism is based on the emotion model proposed by Ortony, Clore and Collins (1988), and can be described as “a subjective evaluation of a given stimulus according to the character’s goals, standards and beliefs” (Aylett et al. 2005). Characters build an internal goal hierarchy and appraise the goals’ importance in relation to available objects, actions of the other characters and consequences of events. The result of the appraisal process determines the emotional state of the character. The appraisals are influenced by former experiences of the organism and result in emotions that can refer to the outcomes of events, the agency of other agents or the attributes of objects. For each of these appraisals the appraisal criterion is different: objects are appraised regarding their appealingness, agents regarding the praiseworthiness of their actions, and the outcomes (or consequences) of events are appraised regarding their desirability. Ortony et al. (1988) posit that different appraisals lead to qualitatively different types of emotions (see figure 3).

The emotional state of a character also depends on a variety of pre-set personality characteristics that are reflected in emotional thresholds and decay rates, emotional reaction rules, action tendencies and goals that are all authored in FearNot! Through authoring significant parts of the agents’ intelligence, their behaviour can be influenced in order to represent the desired overall learning experience. The resulting emotional states can either directly trigger action tendencies, or indirectly influence action selection through problem-focused or emotion-focused coping (Lazarus 1991), with the most intense emotional state triggering the current intention.
4. FearNot! evaluation

The pedagogical aim of the FearNot! software application is to raise awareness and sensitise students for the problem of bullying in school, and eventually to reduce victimisation by getting more bystanders and outsiders involved in helping the victims. While there are already some preliminary results regarding the believability of FearNot! characters and learner reactions to them from earlier evaluation efforts using an earlier version of FearNot! (chapter 4.1), extensive evaluation activities are currently taking place in primary schools both in the UK and in Germany (chapter 4.2).

4.1 Preliminary results from prototype evaluation (Hall et al. 2005)

Preliminary results from evaluations of various prototypes of the software indicate that children empathise with the victimised character and that characters seem to be believable (Hall et al. 2005). Results also suggested that the perceived believability of the conversation with the character is associated with feelings towards the character: children who felt sorry for the characters rated the conversation as more believable and interesting than children who did not feel sorry, whereas children who felt anger towards the characters rated the conversation as less believable and interesting than children who did not feel angry. Even though the early prototypes' graphics, animations, voices, and character movements clearly needed further development, which was acknowledged by the children's critical statements, learners engaged affectively with the characters and their problems, indicating that the social situation (conversation with the victimised character) prompts believability and interest in the fate of the character rather than expressive behaviour alone.

4.2 Current evaluation activities

In order to investigate whether the software really is able to change victimisation within classrooms when applied over a longer period of time, an evaluation study employing a quasi-experimental design with control groups, pre- and post-tests as well as follow-up tests has started in October 2007 (the evaluation scheme for the study is outlined in table 1). Apart from victimisation, the acceptance of and the contentment with the software is going to be evaluated as well as the students’ knowledge about bullying, coping strategies and their empathic reaction towards the FearNot! characters. These variables will be measured using questionnaire methods that are applied at three points of time during a 9 weeks period of time in order to investigate long-term effects of the software interaction.

Table 1: Planned evaluation scheme for evaluating FearNot! in schools (UK / Germany)

<table>
<thead>
<tr>
<th>Week</th>
<th>Control group (delayed intervention)</th>
<th>Experimental group (immediate intervention)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pre-test (including awareness session)</td>
<td>Pre-test (including awareness session)</td>
</tr>
<tr>
<td>2-4</td>
<td>Normal classes</td>
<td>FearNot!</td>
</tr>
<tr>
<td>5</td>
<td>Post-test</td>
<td>Post-test</td>
</tr>
<tr>
<td>9</td>
<td>Follow-up</td>
<td>Follow-up</td>
</tr>
<tr>
<td>10-12</td>
<td>FearNot!</td>
<td>Normal classes</td>
</tr>
</tbody>
</table>

The evaluation study, conducted both in the UK and Germany, employ a randomised controlled design including random allocation of schools to the intervention and waiting control (i.e. delayed intervention) group. Overall, approximately 500 children in Germany and 500 children in the UK, all aged eight to eleven years, are included in the study. The total sample is divided into two groups, one that interacts with FearNot! in between the pre- and the post-test sessions (week 5) and another that serves as a control group with normal classes continuing between pre- and post-test measurement, and a delayed intervention with FearNot! after the follow-up measurement to provide them with the same treatment as the first group. The pre-test session provides some basic information on bullying at the beginning that serves to raise awareness for the bullying problem and thus to provide a common ground for all students involved from where to start the evaluation study.

5. Conclusion

This paper introduces the pedagogical software FearNot! aimed at enhancing knowledge about and sensitivity to the problem of bullying among primary school children. By empathic processes experienced for the virtual victim of bullying episodes depicted by the software application and by means of affective interaction with the victimised character, the individual student empathises with this character and thus explores physical and relational bullying behaviour from the perspective of the victim, while staying in a safe and secure environment at the same time. The main challenge here is to reconcile the immersiveness and
realism of virtual environments as learning spaces with the necessary limitations to ensure the desired learning outcome for the students. The realisation of emergent narrative driven by autonomous characters poses a risk to differentially reinforcing reactions in the learner that are in line with the educational goal; the aim of creating a believable and realistic learning environment therefore needs to be balanced with the risk of reinforcing "unwanted" behaviour, e.g. that the software is used to learn how to bully more effectively.

A carefully planned evaluation study of FearNot! in the classroom, investigating the effects of repeated interactions with the software addresses this issue, among others. While this evaluation study is organised according to sound evaluation standards, it faces a problem that lies in the pre-selection of schools that provide the minimum technical standard to participate in the evaluation study: primary schools – especially in Germany – currently do not have a state funded budget that guarantees supplies of technical equipment to be integrated into everyday teaching or to be used in special projects, resulting in only those schools taking part in the evaluation that put extra effort in their technical equipment. The generalisation of the evaluation results to all primary schools in general might therefore be restricted.

Preliminary evaluation efforts however suggest that the virtual role-play approach is suitable for the target group of primary school students, offering a technologically challenging and immersive new approach for tackling sensitive social issues in the classroom.

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Behind the Scenes with OpenLearn: the Challenges of Researching the Provision of Open Educational Resources

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Abstract: Web-enabled technology is now being applied on a large scale. In this paper we look at open access provision of teaching and learning leading to many users with varying patterns and motivations for use. This has provided us with a research challenge to find methods that help us understand and explain such initiatives. We describe ways to model the research and identify where pressures and contradictions can be found, drawing on a reflective view of our own practice in performing the research. Open educational resources are defined as technology-enabled educational resources that are openly available for consultation, use and adaptation by users for non-commercial purposes (UNESCO, 2002). OpenLearn is one of the largest of such initiatives and is committed to the provision of open educational resources for all. It is being developed by The Open University and is primarily sponsored by the William and Flora Hewlett Foundation. It provides users with over 4 200 hours of higher educational material drawn from Open University courses. Other learning tools such as discussion forums, video conferencing, and knowledge mapping software are also available to the user. In this paper we aim to introduce OpenLearn and outline some of the main research issues surrounding such an initiative. We seek to explore theoretical and practical approaches that can provide suitable tools for analysis. Activity theory is seen as a suitable approach for macro analysis and its use is illustrated in terms of the complexity of large scale research. Activity theory, besides informing research perspectives, can be turned in upon the research process itself allowing us to consider the challenges and context of the research. By using activity theory in this way and illustrating from a range of practical approaches we demonstrate and illustrate a useful research approach.

Keywords: e-Learning, open content, tools, action research, activity theory

1. Introduction

Open educational resources are defined as technology-enabled educational resources that are openly available for consultation, use and adaptation by users for non-commercial purposes (UNESCO, 2002). The internet has recently seen an increase in such initiatives the range including areas such as MIT OpenCourseWare, CORE (China Open Resource for Education), Wikipedia, OpenLearn and OpenCourseWare Universia. Key features of many of such initiatives include the provision of course content, the ability to adapt, use and develop content, the availability of social learning tools, and the introduction of other learning tools. The range of initiatives is illustrated by the membership of the OpenCourseWare Consortium (http://www.ocwconsortium.org) which has members from a diverse number of countries.

The impact of these resources and changes in the ability of individual users to access such educational materials is likely to impact significantly on how people learn. The confinement of knowledge to educational institutes is likely to be challenged. Alternatively, new power structures may arise as a result of ‘big players’ dominating the open resource markets. The question arises as to how these open resources will impact on the learning of individuals or groups of learners. Will these resources empower learners and how will learners’ experience change? Coupled with the advent of open resources there is also the development of new software and hardware tools such as software that supports social learning and mobile computing that may change the possible affordances of such technologies. For instance by combining wireless connectivity with mobility the ability to access information when wanted becomes more achievable. OpenLearn (Figure 1) is a major open content initiative funded by the Hewlett foundation and The Open University. The project was officially launched on 25 October 2006 and currently provides over 4 100 hours of university level material for personal study. The material used in the LearningSpace is currently derived from Open University course material. This has been quality assured and is currently in use or has been used within Open University validated courses. The conversion of this material into an appropriate provision for OpenLearn was conducted using an ‘integrity’ model where the content is kept as close as possible to the original source material with adjustments made relating to presentation on the web, rights issues, and reshaping for a wider audience. These units of study are located within an area of the OpenLearn site known as the LearningSpace. The LearningSpace also allows users to keep journals relating to their activity and to participate in forums relating to each of the units.
Another area of OpenLearn is known as the LabSpace. This space is envisaged as being more experimental and developmental in nature. It is possible for users to download existing content, edit, modify or add to it and upload it as a new version. Educational materials from the Open University's archives are also made available within this space. These materials may be re-worked or re-versioned by users. Users are also able to upload their own course materials into the LabSpace. If the material is suitable it may then be transferred across from the LabSpace into the LearningSpace. The LabSpace contains a number of tools that might be used to help learning, or help a course developer. Compendium is a mapping tool that can be used to help in planning and structuring courses but can also be used for other applications such as mind mapping, concept mapping and the development of integrative diagrams for research. FlashMeeting (Figure 2) is a video conferencing tool that allows a number of participants to interact. It uses a low but useful video frame rate allowing a better audio reception over normal web connections. The OpenLearn servers can cope with up to 100 different users simultaneously, or 50 meetings with two individuals. FlashMeeting is a one click videoconferencing tool and does not need to be installed as long as the free Adobe Flash Player runs on the web browser. The tool uses the 'simplex' or 'push-to-talk' audio tool allowing only one to be broadcasting sound at any one time which is ideal for interviews and multi-party broadcasting. The conferences are recorded remotely and may be viewed privately at a later date or made available to the world at large. The LabSpace also includes a chat tool, MSG, which is a text driven messenger.

The roles of the LearningSpace and LabSpace and their inter-relationship are in a state of continual evolution. Recently, for instance Compendium has been additionally made available in the LearningSpace. Once a course has been uploaded to the LearningSpace the link to each course is relatively stable although at a later date a course may be replaced, updated or moved to the LabSpace. FlashMeetings can be booked at any time via the relevant link within the LabSpace. All FlashMeetings are permanently recorded and are either restricted to a group designated by the users, or can be made open to the public. Users can provide links directly to their recorded FlashMeeting without having to go the main OpenLearn site. A number of forums exist attached to the subject areas. These are readable for all and writeable for OpenLearn registrants. Some of the tools such as MSG (chat) are currently restricted to registrants only.

A typical user might enter the site and decide to enrol on a unit. Each unit would take between and estimated 3 to 15 hours of systematic study. At the time of writing there were 352 units in the LearningSpace of OpenLearn. Examples of units include; French: Ouverture, Knowledge Mapping, Understanding Operations Management, The Meaning of Home, and Earthquakes. Many users will dip into the units, reading some bits and skimming others. Others might focus on tool usage, social learning or using and drawing from materials for teaching purposes.

The servicing of OpenLearn and its maintenance is funded by the project grant from Hewlett Packard and the Open University. One of the main themes of the research is how to sustain the project beyond the end of this funding.

2. OpenLearn – The research challenge

OpenLearn is a large project with a dedicated research team consisting of three individuals involved with research and evaluation. A significant proportion of the project budget has been set aside for research. Besides this dedicated research team others within the project have research interests including academics responsible for the transformation and development of content, and those involved with the research and development of software tools. The project as a whole is viewed in terms of an action research model where the results and impacts of research are fed back into project development. Within this paradigm there is also the challenge and the tension between academic research requiring high degrees of rigour and having underlying theoretical aims and that of applied research with the requirement of fast-feedback and relating more to the success of the site via such issues as marketing, usability studies, site design etc.
In addition to team members and their research interests other sources of research input have been used. This has included the formal employment of university expertise for usability studies and the help of PhD students. Non-formal sources of research input have included voluntary interactions with the OpenLearn team and academic input from the wider community. This community includes those with expertise in eLearning, many within the university, who may share formally or informally in the development of the project. Further afield there is the impact and influence of the education research community, especially in relation to eLearning, and the OpenCourseWare Consortium that provides a structured working environment and opportunity for the coming together of various open content providers.

Researching such a large project involves examining several different areas, each of which presents its own set of challenges. The four main strands of research include; teaching with OpenLearn, the users experience, project development, and sustainability. To this we can add a meta-layer; the challenge of researching open content. This paper is chiefly concerned with this objective and aims to illustrate our own problems and dilemmas in conducting such research and by offering our insights into models of research provide a guide for others in research techniques.

An idealised approach to the research has been to:

1. identify and develop theoretical frameworks for analysis at macro and micro levels
2. find tools and ways of mapping and talking about our research
3. develop and find appropriate methodologies to enable us to collect and process research findings

This list may seem very logical and structured as presented here but the evolution of the framework, as we learn within an action research paradigm is more haphazard and iterative in nature. A research technique is seen not as something developed in advance but rather as something in the process of development with continual trials, implementations and reworking. OpenLearn itself is a continually evolving construct and this presents an additional challenge to research. The three approaches listed above will be described in more detail with specific reference to research within the project and also to researching users’ experience.

2.1 Developing theoretical frameworks of analysis at the macro and micro levels

2.1.1 Action research

One possible criticism of academic research is that the impacts of such research often have little effect on practice. A possible reason for this may be the divide that exists between the world of academia and the world of work. The process of academic research can be very slow with the major outputs often consisting of writings in journals for an academic audience. Research is often conducted from ‘afar’ that is, it is separate from the object of research. An advantage of this is that research is more likely to be independent if not connected to the object of the research. This independence and objectivity is unlikely to be untainted in that research and researchers are embedded within research paradigms, personal social-cultural influences, and the influence of the grant holders who partially or wholly shape the research questions. The principles of action research call for a research process that involves change within that which is researched (Greenwood et al 2006, Somekh 2006). In a sense it is more of an experimental ‘trial and error’ process in that it is iterative, ongoing and affects change in practice. It can therefore be seen as a process of reflection and practice, often referred to as praxis. In order to affect action research it is necessary to

1. involve more of the organisation than simply the dedicated researchers,
2. to integrate the results of the research into decision making at managerial levels.

Dangers exist however when moving towards a culture of ‘self-development’ where Action Research is seen as an efficiency tool as opposed to its more idealised aims of democratisation, development and empowerment of workers (Greenwood et al, 2006). There are also dangers when research is taken out of the hands of research savvy practitioners and placed in those of research novices. Hence there may be many models of action research adopted according to one’s perspective. Another key issue of action research is the ‘social-technical’ view which sees the successful development of any organisation being an integration of the right social and developmental environment with the use of appropriate tools. For example, the use of tools for doing research and for enhancing interpersonal communication within the research community and others in the organisation is part of praxis resulting from the research itself. Action research can provide us with a framework of research at the level of OpenLearn as an organisation but also as a framework of reflection and practice within the Research Unit. In this case we see this as a way of developing ourselves as individuals and as a team allowing an exploration of ways of working and knowing. Somekh (2006: 7) says:

‘The self of the researcher can best be understood as intermeshed with others through webs of interpersonal and professional relationships that co-construct the researcher’s identity’

In this sense action research is about both personal and professional development.

2.1.2 Activity theory as a way of modelling macro behaviour

OpenLearn represents one of the largest educational interventions on the Internet and as such the opportunity exists to understand how this operates and develops at a macro level. Possible contenders for analysis include activity theory and actor network theory which allow potential ways of understanding macro-behaviour. Actor Network Theory (ANT) focuses on identifying the various actors in a social organisations and examining the relationship between these actors (Latour, 2005). Activity theory focuses on action as it is mediated by tools within a socio-cultural context (Cole and Engeström, 2003). It was used as an analytical framework in this instance because of its educational applications including learning in organisations and that ANT was felt to be less clearly structured as an analytical tool.

The foundation for Activity Theory comes from the Vygotskian view that all action is mediated by tools whether these be external or internal, concrete or psychological (Vygotsky, 1980). This has been developed into concepts such as ‘person plus’ and cognition as a distributed activity located within a social group and
the tools that they use (Perkins, 1993). Leont‘ev, a prodigy of Vygotsky, explored the way in which this could be applied through emphasising the activity as the main unit of analysis (Kapte linin and Nardi, 2006). Engeström extended the framework and the subject-tools-object model to take into account aspects of the context within which such action was taken (Cole and Engeström, 1993). He represented the inter-relationships between these contextual elements within a triangular structure each node representing some aspect of interaction. The additional contextual nodes that he added were ‘rules’, ‘community’ and ‘division of labour’ (Cole and Engeström, 1993, Kapte linin and Nardi 2006). This framework was adopted as a practical tool of analysis since it could be applied to view OpenLearn from any number of different perspectives. These different perspectives could then be contrasted, reflected upon, or pushed against each other to force the identification of characteristics within each perspective and various ‘contradictions’ that existed between such perspectives.

Figure 3 demonstrates the use activity theory as a way of viewing the Research aspects of the OpenLearn. Researching such a complex and large educational initiative provides many opportunities and areas for potential study and often these are driven by project aims. These aims can be envisaged as being part of the rules in which the research is located and represent rules embedded in project design. Other rules are external to the project and include guidelines for general social research. These deal with issues such as research ethics which can sometimes create tensions in terms of the need for fast feedback and the drives for ‘interesting stories’ that may come from other parts of the project such as marketing, or management. ‘Rules’ may also relate to perceptions of individuals within the team (i.e. not formally held or shared rules) and relate to theoretical perceptions and opinions on the nature of good educational practice. Much research demands a certain standard of rigour (lower risk of error) which might create contradictions with the need for quick feedback (higher risk of error) to help move the implementation process forward. This contradiction highlights a general problem of the slowness of academic research to reach and inform its intended audience. By identifying and recognising this contradiction ways can be investigated for disseminating research internally in order to quickly feedback into the implementation and adaptation processes.

When examining Figure 3 contradictions maybe analysed within the structure itself e.g. between the research interests, motivations, and perceived views of the team players, between individuals and rules, about the essence and nature of research itself, about the choice of methods to monitor the learning effectiveness of OpenLearn. Contradictions can also be viewed as occurring across different perspectives. For example a contradiction may exist between the need for neutrality and a critical approach of the researchers within the research perspective and the need for promotion and publicity within a marketing perspective that is directed towards gaining the attention of users.

2.1.3 Activity theory and action research

It is clear that Action Research and Activity Theory can be used effectively together. As Somekh (2006: 22) says when talking about Action Research,

‘...activity theory is particularly helpful because it gives priority to collaborative decision making on the basis of sharing knowledge about identified ‘contradictions’.

The socio-technical aspects of action theory can be related to aspects of tool mediation and the development of community. Activity Theory can be used to identify contradictions and these can be used to implement change. Such change might create new contradictions but through the iterative process of action research improvements can be made. A multi-perspective approach can be used to inform those working within OpenLearn to affect change. The challenge of how this dissemination occurs is something that needs to be addressed.
2.2 Tools for mapping and talking about research

Taking into account the socio-technical aspects of Action Research and the central role of tools within Activity Theory the development of various tools for thinking, analysing and describing is a key part of our research process. With such an array of available media there are difficulties in identifying the most suitable way or ways for research discussion and dissemination. The development of a research community that allows the findings of OpenLearn to be discussed and disseminated can be seen as a good area for the application of action research. It can mean experimenting with different tools and the construction of different types of space. In discussing and disseminating research findings a number of technological options present themselves as possible platforms e.g. blogs, wikis, editable web sites and facilities which can be found in the LabSpace. Within the LabSpace there is the opportunity to create discussion forums around research issues. These forums can be opened up to anyone. Also we can provide our own research space within the LabSpace. Individual and collective blogs can also reveal insights into research and development of OpenLearn and open content as a whole. Linking and exploring blogs can be of value as a research activity. An example of a blogged resource open to all is that of the ‘OpenLearn2007’ (2007) conference held at the Open University, Milton Keynes. Each of the presentations was informally blogged by attendees and the blogs made available to the world at large.

Compendium is an example of a software tool available within OpenLearn that can allow the development of concept maps, integrative research diagrams and help to structurally organise and develop courses. As a tool within OpenLearn it is still undergoing development. Any type of mapping allows the user to present in a way that combines text and graphics in a visual dynamic that can represent various structures, concepts and their relationships. They thus exist as a tool allowing users to reach beyond the limits of the mind in terms of its cognitive load. Although compendium has some limits compared with pen and paper it has affordances in that it is editable, re-mouldable, non-linear, allows multidimensionality, nesting and layering, allows links to other technical resources such as web pages, documents, images etc. It can also be shared dynamically between teams and individuals. Such a tool can allow us to model research complexity and represent discussion around theoretical issues.

2.3 Developing appropriate methodologies

Researching OpenLearn is a complex phenomenon and various tensions exist internal to the research perspective in such issues as:

- tensions between pedagogical paradigms
- intrusiveness of research methods
- nature of sampling and reaching hard to reach groups
- speed of research feedback
- choosing suitable analytical techniques
- dissemination methods
nature of research tools used
-dealing with a non-homogeneous user base

As an example we can look at one of these issues in more depth. One of these is the fact the user base appears to be very heterogeneous and heavily skewed in terms of time spent on the site toward the low user. This pyramidal structure in terms of the time spent visiting a site is probably a common occurrence in many web sites although comparative studies are difficult because open content sites may differ greatly in form and function. Every website is in a sense competing against a large number of other sites in terms of grabbing a person’s attention and part of the decision that people make in spending time on a site is their initial perception of the site’s value. This can very much depend on how the home page of the site is presented and whether the site gives a clear indication of what kind of content or activity that it might contain.

A major challenge is to find out about the user experience. Questions relating to this challenge include:

1. how does the use of OpenLearn fit into the wider context of the user’s formal and informal learning context?
2. are users learning from OpenLearn? If so how are they learning?
3. are users engaging and using the tools? If so what are they using the tools for?

Although there have been over a million discrete visitors to date the median estimated dwell time is relatively short with a heavily skewed distribution. For example about 50% of registered users have spent less than 30 minutes on the site in total although some 10% have spend more than four hours on the site in total. Does this mean that we should assume that the users with low dwell times are simply browsing and not learning much? Or might they be picking up small chunks or bits of information? The challenge of finding out about the ‘fleeting’ user is different from that of finding out about the more substantial user. Distinctions will also exist in terms of types of users. Users are able to freely re-use the material and republish under the commons license although it is a small minority who may need or want to do so. A teacher may draw from OpenLearn content to use in their teaching. Teachers and academics may wish to edit and change content which they are able to do in the LabSpace. Others may be interested in joining in the OpenContent research participatory groups or forums to discuss the research and development of open content and open educational resources. Learners may primarily study or use content but others may engage with social learning or using OpenLearn tools. Part of the challenge is to identify the types of user.

One possible means of tracing the user’s experience is by using website logs. Generally one can infer whether a user was browsing, skimming, downloading or printing content, or systematically studying or reading parts of a unit. This however does not tell us about what the user is learning and with OpenLearn it is not possible to use pre- and post-study tests since learners will often not be studying a unit as a whole. In this instance thinking of the units as courses is inappropriate since this implies a journey from a starting point to an end point, and an externally structured pathway through the material often with some form of assessment. Identifying learning therefore depends on the unique experiences of users and needs to be process orientated. In order to get at the experience of users and the process of learning qualitative studies can provide a rich picture and thick description of users’ experience. There are also several technological tools that can help the researcher in this process although there is always the problem of the degree of intrusiveness in any research exercise.

One method of examining whether learning is taking place is by in situ observation and making inferences from user activity. Getting users to think aloud and to record their thoughts can help in this although there are disadvantages to this technique. Another is by using interviews where a user’s learning experience can be examined. Simple questions such as ‘What have you learned?’ or ‘What have you found out that you didn’t know before?’ can act as the basis for more probing questions perhaps relating to a range of skills within Bloom’s taxonomy (Bloom, M. et al 1956). A problem of such interviews is that they can become an additional form of teaching in that by causing the participant to recall or reconstruct their experience one is actually changing and reshaping it. Thus the research is adding to the learning experience.

Remote monitoring can allow a clearer insight into the actual live experience of the learner. This can be achieved in a number of ways. One such method has been co-developed with a volunteer who has been examining how to change and modify unit content within the LabSpace. This involves downloading pre-existing content, modifying and/or adding to it, uploading it back into the LabSpace as a new version. The research process began with communication using email and a FlashMeeting interview (a free video conferencing made available within the LabSpace) where a fairly open ended task was set up. This involved
downloading one of the units from the LabSpace and making adjustments to the unit and adding to it i.e. ‘re- versioning’ the unit.

Jane, the volunteer, was given a series of options for recording her activity including the use of a video camera, digital camera with video capability or using CamStudio™ an open source facility that records screen activity and audio. After trying all three methods she decided to use CamStudio™. This allows screen activity to be recorded but also allows the user to make a simultaneous voice over commentary. Jane made three recordings showing the process of downloading and uploading the materials and the difficulties that she encountered. This provided a useful insight into the problems of uploading and downloading content. These technical difficulties were reinforced from some data based on email questionnaires that had been given to a wider sample of users, some of whom had attempted to try to modify or upload material. Although Jane represented a potential content producer, as opposed to learner, it demonstrated the successful application of a remote monitoring technique, although admittedly she had a certain level of technical expertise in that she could handle the installation and running of CamStudio™. After the exercise she was further interviewed about her experience using FlashMeeting. The greatest benefits of this research were in terms of feedback to the team to help in the development of OpenLearn (as a form of action research) rather than in exploring theoretical and academic issues. However, in terms of the personal development of team members it helps toward developing ways and thinking about issues of monitoring remote experience.

Other possible remote monitoring tools exist and in praxis we will experiment with various techniques to find those that work best.

3. Discussion

OpenLearn represents one of the largest developments within the open content community and presents a challenge for research. This challenge exists within four strands: teaching with OpenLearn, the users experience, project development, and sustainability. In this paper we have indicated and discussed the use of action research and activity theory as tools to enable us to think and understand the dynamics of a large educational initiative. Action research can potentially allow reflection, action and change within such a project. Activity Theory represents a tool for recognising areas for action and change and communicating issues to the project team. It also allows us as researchers to inwardly analyse our own behaviour and help in our personal and professional development.

As researchers there is the need to disseminate internally and externally the research findings to inform change. The development of communication tools and the novel use of technology to do this is considered an evolutionary process, one of trial and error, experiment and change. Providing useful research networks and integrating with others is important in the social construction of knowledge and understanding about open educational resources. How to use tools such as videoconferencing (FlashMeeting), blogs, and dedicated website space effectively is a challenge and an important part of our own iterative process of development within an action research framework. Reflecting on our own research practice can be considered a meta-research process.

Some of the research challenges of finding out about users’ experience have been illustrated. Possible technological tools that can help in this process have been discussed. A consideration of the use of tools as appropriated by individuals is a characteristic of the socio-technical view of action research. We have considered researching OpenLearn in terms of a number of different perspectives and themes. A three level approach has been presented. At one level OpenLearn can be viewed using activity theory to shape various perspectives and then examine intra-nodal and extra-nodal contradictions between the perspectives. At the level of the community of researchers there has been a consideration of the sharing and dissemination of knowledge and the tools that can aid this process. At the third level there has been a consideration of the challenge of developing research tools using the iterative processes of action research where, as in Engeström’s (2005) ideas of expansion, people, tools and community are in a constant state of change.

References


Exploring the e-Learning State of Art

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Abstract: e-Learning implementation is an area in progress that continues to evolve with time and further research. Researchers in the field argue that e-Learning is still in its infancy, resulting into numerous implementation strategies across a wide e-Learning spectrum. This paper explores the e-Learning state of art. It provides a general overview of the learning process, evaluates some current implementation trends pointing out a range of frameworks and strategies used in the past decade. This is followed by an identification of emerging issues from which two problems are identified; 1) the limited uptake of technology as an instruction delivery method; and 2) the ineffective use of technology to support learning. In respect to this, future research should therefore seek to further investigate these aspects and to explore suitable approaches for effective implementation of e-Learning to support learning. Not the least in higher education contexts.

Keywords: e-Learning; learning, e-Learning implementation; higher education, learning process, learning theories, learning methods.

1. Introduction

e-Learning is a concept derived from the use of information and communication technologies (ICTs) to revise and transform traditional teaching and learning models and practices has evolved in the past decade. This evolution has resulted from the emergence of the information society and has greatly impacted on the global economic and socio-cultural development. However, researchers in the field still argue that the development of e-Learning has not been tested by time and is still in its infancy (Hui et al. 2005; Gao et al. 2006). This has resulted into continued research in the e-Learning field generating numerous implementation strategies a scope that requires identifying and understanding.

While e-Learning presents numerous opportunities to support learning, e.g., Garrison and Anderson (2003) notes that creating an e-Learning experience involves “a serious commitment to understanding the different features of this medium and the ways it can be used most advantageously to impart learning”.

It is particularly interesting to note that even in supposedly mature contexts, such as university education, there are wide discrepancies. While some universities have achieved considerable benefit in the adoption of e-Learning (Meredith and Newton 2003), others are still struggling to realize the attainment of the minimal educational value (Marshall and Mitchell 2002). This is the case despite that skilled and interested personnel as well as increasing number of students in many cases force universities to embrace this education venture.

Therefore, as a base for research in the e-Learning field with an aim of identifying suitable strategies for effective e-Learning implementation, this paper explores the e-Learning state of art in higher education. It provides a general overview of the learning process, theories, and methods. Thereafter, it analyzes e-Learning implementation trends, eliciting a range of frameworks and strategies. It investigates some e-Learning implementation aspects within higher education and finally it provides a discussion where some emerging trends with high impact on e-Learning implementations are identified. We conclude the paper by suggesting some particularly interesting topics for future research in this field.

2. Conceptualizing the learning process

It comes as no surprise that education is becoming increasingly vital in the knowledge society, resulting in new ideas within the area of learning and teaching (cf., e.g., Bleimann 2004). Furthermore, general developments in higher education, resulting from societal demands as well as an increased need for...
students to become autonomous, have increased the need for academics to understand the learning process (Webster and Sudweeks 2006).

Needless to say, many approaches to e-Learning have been suggested over the years, but most people tend to agree that learning is a process through which learners achieve their learning goals by carrying out a number of learning activities and participating in interactions to reflect their understanding (cf., e.g., Sun et al. 2004). Thus, learning seems to result from a change in students’ perception of reality related to the problem area under study as discussed in, e.g., (Rekkedal and Dye 2007). Learning is then concerned with the way people acquire new knowledge and skills and the way in which existing knowledge and skills are modified to solve problems (Shuell 1986). It does not involve some kind of obscure transfer of knowledge from one source to another, but rather consists of the active role played by the learner to process the information for use (Barnard 2006).

In this direction, Shuell and Lee (1976) define three criteria of learning which are: a) a change in an individual’s behavior or ability to do something; b) a stipulation that this change must result from some sort of practice or experience; and c) a stipulation that the change is an enduring one. The latter two exclude behavioral changes such as maturation and temporary change due to drugs, etc.

Furthermore, it has become increasingly apparent that the amount of knowledge students possess has a substantial impact on their learning processes (Chi et al. 1982) and learning styles. Students learn in differing ways and the manner in which information is presented to them affects their ability to learn. Consequently, the learning style must be differentiated. In this regard, Sun et al. (2003) identify three learning styles to support students in their learning process:

- **Visual learners** learn best through seeing things such as images, demonstrations, facial expressions, and body language of the instructor to fully understand the content of the lesson;
- **Auditory learners** learn best by hearing things through verbal lectures, discussions, talking things through and listening to what others have to say;
- **Tactile/Kinaesthetic learners** learn best through experiencing, reflecting, interacting, and doing things. These learners prefer to actively explore the physical world around them and would benefit from manipulating real objects and/or acting on them in a simulated environment.

However, students need to utilize the different learning styles interchangeably during the learning process in order for them to have an effective learning experience.

### 2.1 Learning theories

Learning theories are concerned with the actual process of learning, not with the value of what is being learned. The central ideology of learning theories is that learning occurs inside a person (Siemens 2004). There are basically three main perspectives in learning theories that provide an understanding of an inherent learning process through which learners can construct knowledge within a particular environment.

**Constructivism** (Honebein et al. 1993; Fosnot 1996) guides learners and instructors in conducting, managing and encouraging personalized learning activities through collaborative learning. This type of learning facilitates critical thinking and problem solving. The learner actively constructs or builds new ideas using previous knowledge and experience attained. During the learning process, the teacher takes on a facilitator role focusing on making corrections, fostering new understandings, and creating social disclosure. The learners take on the responsibility of learning by actively participating in the learning activities placed at the centre of the learning process. This learning theory has guided many educationists in providing education encouraging hands on for learners (Gregson 1997). To this effect, Koohang and Harman (2005) affirm that in a constructivist environment, learning situations represent the normal complexities of the real world. As a result, multiple perspectives and representations that promote cooperative and collaborative learning are encouraged.

**Cognitive** theories describe learning as involving the attainment of the cognitive structures through which human beings process and store information (Good and Brophy 1990). They demonstrate how a student perceives, processes, interprets, stores, and retrieves information and are mainly concerned with the changes in a student’s understanding that results from learning. The student is involved in the learning process, so the teachers have to present organized information in a way the student can relate to. Shuell (1986) emphasizes that a cognitive approach stresses learning as an active, constructive, and goal oriented process that is dependent upon the mental activities of the learner.
Behaviourism defines learning as an observable change in behaviour. Consequently, behaviourists assume that behaviours are observable and can be correlated with other observable events. The learning focuses on stimuli, i.e., what has an impact, and response, i.e., how the behaviour of organisms changes. Belkin and Gray (1977) emphasize the significance of conditioning in behaviourism theories. They indicate that learning occurs as a result of positive reinforcement leading to old patterns being abandoned as a result of negative reinforcement. The learning activities carried out during teaching are arranged contingencies of reinforcement under which learners construct knowledge.

Thus, learning theories explain the learning process through which learners are able to acquire knowledge, but there is no single learning theory that can fully explain all types of learning. Consequently, several theories coexist and complement each other during a learning process. It should be kept in mind, though, that the attainment of the learning concepts varies from one learner to another and the learning methods dictate the level of knowledge to be attained. We will therefore take a closer look on this issue in the forthcoming sections.

2.2 Learning methods

Learning methods are referred to as ways through which instructors deliver instructions and learners access these instructions. Several learning methods have been described in literature, including traditional learning, e-Learning, blended learning, mobile learning, and personalized learning.

Traditional learning refers to face-to-face sessions, through which the teacher delivers course material to students in the same place and at the same time. The learning method is teacher centred, where the teacher focuses on providing the learning information to the students. Assessments depend on study notes given to students by the teacher, limiting the learner’s knowledge acquisition boundary. However, Chickering and Gamson (1987) suggest that students must do more than just listen to what is said in class, such as read, write, discuss, or be engaged in solving problems constructively.

e-Learning, on the other hand, refers to the use of ICTs to transform and support the learning process ubiquitously. For instance, Meyen et al. (2002) define e-Learning as the acquisition and use of knowledge which is distributed and facilitated primarily by electronic means. Such electronic means may include internet, intranet, extranet, CD-ROM, video tape, DVD, TV, and personal organizers. e-Learning can be carried out in several ways which include computer based, asynchronous, and synchronous learning (AEN 2002). This facilitates an environment where the students take ownership of their learning. However, given the varied forms of learning styles, unavailability of e-Learning technologies and skills, a blended approach is often adopted.

Blended learning makes use of a combination of various learning methods that include face-to-face classroom activities, live e-Learning, and self-paced learning (Valiathan 2002). This learning method encompasses a variety of tools for simulating and maximizing the learner’s learning potential. Some have suggested that the provision of a learning process with a variety of methods, through which learners can acquire knowledge, improves their learning potentials (Dean et al. 2001; Lubega and Williams 2003). This has resulted in the adoption of this learning method in various higher education institutions of learning.

Mobile learning is defined as learning or delivery of content that is facilitated by the use of portable technologies such as mobile phone, PDAs, or iPods (Wagner 2007). The global penetration and the use of mobile technologies have created new avenues and enhancements in teaching and learning activities in higher education (Armatas et al. 2005). Currently, mobile learning presents vast benefits that facilitate and enhance e-Learning. However, (Kinshuk et al. 2003) note that mobile learning methods are still in their infancy and have not been fully adopted as a learning method.

Personalized learning is a learning approach that facilitates and supports individualized learning. Each learner has a learning path that caters for learners learning needs and interests in a productive and meaningful way. One of the attributes of personalized learning is the ability to dictate the students’ learning. For instance, learning objects can be used to facilitate personalized learning if integrated with systems that can present different learning objects to different students simultaneously (Graven and MacKinnon 2005).

Advancements in technology have led to a paradigm shift from traditional to personalized learning methods with varied implementation strategies and we will explore the e-Learning state-of-the-art over the past decade.
3. e-Learning implementation trends

Significant work in e-Learning development have been presented in the literature ranging from comparison studies, pedagogical aspects, perception studies, and evaluation to monitoring studies. This has, not surprisingly, resulted in the development of various e-Learning implementation strategies and models.

3.1 Defining e-Learning

Although the term “e-Learning” has been commonly used in the past decade, various definitions have been formulated to refer to the same educational experience. Examples of definitions include:

- Instructions delivered via all electronic media including the internet, intranet, extranet, satellite broadcasts, audio/video, interactive TV, and CD-ROM (Engelbrecht 2003);
- Learning facilitated by internet and www technologies, delivered via end-user computing that creates connectivity between people and information and creates opportunities for social learning approaches (Meredith and Newton 2003);
- Distance education using the internet and/or other information technologies (Watanabe 2005).

We will take a general approach herein and define e-Learning as a learning method that uses ICTs to transform and support teaching and learning process ubiquitously. This takes into consideration a multitude of e-Learning technologies that we will discuss in the section that follows.

3.2 e-Learning technologies

There are several e-Learning technologies in use that dictate how actual learning will take place depending on the environment in which they are implemented. These technologies include TV, CD ROMs, LMS, CMS, LCMS and virtual worlds as well as collaborative technologies (Barron 2002).

CD-ROM media have been used to deliver learning material to students on distance programs (Gooley et al. 1994). This media was adopted mainly in the early 1990’s and supports learning content in text or multimedia formats. Use of CD-ROM media encourages independent learning where learners learn by executing special training programs on the computer irrespective of internet connectivity. This tool is commonly used for Computer Based Training, such as those usually offered as tutorial with new software and tutorials for learning foreign languages.

Learning Management Systems (LMS) are a whole range of information systems and processes that contribute directly or indirectly to learning and to the management of that learning (Mayes and De Freitas 2004). They are primarily developed to provide online learning services for students, teachers, and administrators. Examples of LMS include (KEWL 2005) and (Blackboard 1997).

Content Management Systems (CMS) such as (Moodle 1999) are developed to facilitate the collaborative creation of content, organisation, control and to manage the publication of documents in a centralized environment. Learning Content Management Systems (LCMS) are mostly web-based systems that combine the management and administrative functionalities of LMS and CMS to author, approve, publish, and manage learning content. An example of such technologies is the Macromedia Course Builder (2008).

Multimedia Communities and Virtual Worlds have transformed e-Learning environments from disseminating only text based to one that incorporates multimedia content. Omwenga and Rodrigues (2006) affirm that “it is the online delivery of information, communication education and training providing a new set of technologies that can add to all the traditional learning modes-CD-ROM, and traditional computer based training”. The CSILE/Knowledge Forum (Scardamalia 2004) is an example of such a tool which incorporates a multimedia community space that enables learners to make contributions and share reference material.

Virtual worlds, on the other hand, mimic the real world and have become popular and promising in facilitating student learning. They provide an enrichment of the educational experience that is compelling, informative, and fun (Kailia 2001). In addition, they create new learning opportunities through which exercises and situations can be simulated and tested (Hansson 2006). Graven and MacKinnon (2005) point out the following examples:

- DVTS-Based remote laboratory across the pacific Over the Gigabit network
- Web-based Activities around a Digital Model Railroad Platform
The Automatic Control Telelab: A User friendly Interface for Distance Learning
A low-cost PC based Virtual Oscilloscope

According to Cross et al. (2007), multimedia communities and virtual worlds provide a learning environment that stimulates learners’ high order thinking and knowledge development and creates social groups.

Learning objects as defined by Wiley (2000) are digital resources that can be reused to support learning. The definition includes anything that may be offered across a network such as digital images, text, etc. IEEE-LTSC (2005), on the other hand, defines a learning object as an entity, digital or non-digital, that can be used, reused, or referenced during technology supported learning. Learning objects are created to provide usable content in various disciplines and context, as a result cutting down on production time and cost, enhancing productivity, and improving the quality of learning (Koohang 2004). The learning object’s potential of being reused, adapted, and scaled has led to their wide usage within e-Learning (Hodgins 2000). In this respect, they provide a comprehensive suite of e-Learning capabilities that enables interoperability, accessibility, and reusability of web-based learning content. Graven and MacKinnon (2005) affirm that the current e-Learning trend should place emphasis on creating pedagogical technologies to support the authoring of learning objects.

Game authoring technologies aim at enhancing and facilitating the students’ learning process through built-in simulations and interactions (Gee 2004). Online games range from text based games to games that incorporate graphics and virtual worlds populated by many players simultaneously (Graven and MacKinnon 2005). They create social communities that facilitate knowledge sharing and creation; a concept commonly referred to as ‘edutainment’. Examples include (JISC 2007):

- **Supercharged**: developed as an MIT-University of Wisconsin partnership project as part of the Education Arcade, and has been piloted in schools in the US – Used to teach high level conceptual physics.
- **Savannah**: is a mobile game that introduces young learners to natural history concepts. The game, designed at the Futurelab with the BBC National History Unis designed to enable young children to role play the life of lions in the open savannah.
- **The Racing Academy game**: is a racing car physics simulation and has been developed by Lateral Visions with Futurelab to support learning communities in the field of engineering and science.

These technologies have facilitated communication and interactivity between students-students and students-teacher as affirmed by the models and strategies in the next section.

### 3.3 e-Learning communication and interactivity

Hansson (2006) points out that the adoption of technologies in education has created new opportunities for interaction in teaching and learning activities. For example, Garrison and Anderson (2003) through their community of inquiry model assert that the true uniqueness of e-Learning lies in its multidimensional forms of multiplicative communication and interaction. Through these interactions, learners are able to assume control and directly influence their learning outcomes. This interactive form of learning is further illustrated in:

- **Salmon’s Five Step Model** (Salmon 2000) that reflects a positive progression in the quality and intensity of interaction between students-students and students-teacher. This model advises on the instructor’s role during learning depending on the students’ needs and circumstances in a learner-centred atmosphere.
- **The Content-Communication-Collaboration Model** (Dempster 2004) providing for a selection of technologies and methods that support increasing integration of dialogue across the learning activities. This model allows mapping of learning activities (presentation, practice, communication, interaction and collaboration) during learning.
- **Conversational framework** (Laurillard 1993) constitutes an iterative dialogue between teacher and student that facilitates high-level cognitive skills.

Omwenga and Rodrigues (2006) also advocate technology mediated learning systems to aid learning in a flexible environment. They provide a framework for evaluating and validating e-Learning processes in an integrated environment, taking into consideration the contextual and pedagogical issues. These initiatives present an understanding of the importance of building communities and interactivity within e-Learning environments that facilitate student learning.
e-Learning significantly enhances the learning process by enabling increased access to knowledge and interactive learning techniques (Digital Opportunity Initiative 2001) at all educational levels. The section that follows provides an account on the e-Learning developments within the higher education context.

4. e-Learning changing the higher education process

The structural changes in higher education institutions over the past decade have mainly been attributed to the introduction of technology initiatives (Singh et al. 2005). e-Learning has created flexible approaches to learning for students who in the past lacked opportunities due to factors such as employment, families, lack of money, distance, and time. To this effect, technology in general has not only improved knowledge storing methods and learning techniques but has also acted as a catalyst to combat the barriers of inflexible organisational structures (Shabha 2000). As a result, many higher education institutions have adopted e-Learning in their curricula.

e-Learning has transformed the traditional teaching and learning models and strategies (Graven and MacKinnon 2005; Suresh 2005). Inevitably, the competitiveness created by e-Learning within the higher education context implies that institutions that have not joined this education venture risk losing out. The current transformations of the higher education processes have been mainly attributed to:

- The drive to join the knowledge society and knowledge based economy;
- The opportunities presented by the advances in ICTs to meet the increasing student needs at a reduced cost;
- The growing demand for knowledgeable and skilled personnel in the labour market;
- Escalating numbers of on-campus students, off-campus students, and life-long learners and the “on-the-move” personnel who seek to continue with education in the workplace;
- The growing demand for alternative learning methods and availability of electronic learning resources;
- Collaborative research opportunities.

However, while e-Learning provides a flexible learning environment, it requires more than just transforming learning material into web-based environments and learning online. Successful implementations of e-Learning environments require an understanding of the technology and pedagogy integration for learning to take place effectively (Govindasamy 2002; Engelbrecht 2003).

Additionally, the paradigm shift from teacher centeredness to student centeredness has greatly influenced the higher education learning process (Sherry and Wilson 1997). In this case, the teacher takes on a facilitator role while the students take ownership of their learning and personal development.

On the other hand, the adoption of e-Learning has reportedly created new educational issues for lecturers, such as the changing work patterns and in some cases the resistant integration of technology (Singh et al. 2005). This has been mainly attributed to the perceived increasing workload and the lack of skills to develop and manage an online course. Serwatka (2002) points out that teaching techniques used by lecturers in traditional courses may also have to be reviewed and modified, as they do not always prove to be effective or necessarily transferable into e-Learning environments.

5. Discussion

5.1 Evolution of e-Learning

Within the e-Learning context, advancement in network technologies, e-Learning technologies, and content development has facilitated multiple content presentations, personalization and ubiquitous learning.

The evolution of network technologies has been evidenced from the development of client-server networks to wireless broadband access technologies. The architecture of client-server networks enable learners to access the learning materials from a centralized server. This architecture has been further developed to include web-based features that have led to the emergence of Internet/Intranet/Extranet technologies that support learning through virtual/web-based environments. The progression of technology has further led to
the development of wireless broadband access technologies that support learning through the use of portable devices. Figure 1 illustrates the evolution of the network technologies.

![Figure 1: Evolution of the network technologies](image1)

In the past decade, e-Learning tools have evolved tremendously from CD-ROM media to personalized technologies that cater for individual students' needs as shown in Figure 2. This evolution has been partially enabled by network technologies as underlying infrastructure. The basic CD-ROM media provides portable content that can be accessed by learners without being facilitated by network technologies. LMS/CMS/LCMS, multimedia and virtual communities, game authoring tools, and personalized tools on the other hand are facilitated by network technologies in providing various capabilities that support student learning as pointed out in the section that discussed e-Learning technologies.

![Figure 2: Evolution of e-Learning technologies](image2)

The development of e-Learning content has been highly facilitated by advances in e-Learning technologies. Content development has been transformed from text based to include multi-media supported content that caters for personalized learning, as illustrated in Figure 3.
Implementation of e-Learning has been attributed to the evolution of technologies as described in figures 1-3. However, the implementation of e-Learning needs to be applied within a context, such as environment, resources, digital divide, in order to successfully realize the full potential of e-Learning.

5.2 Emerging issues within the higher education context

Despite the advancement of e-Learning tools, several emerging issues that have impact on successful e-Learning implementations in higher education have been cited. These include:

Identifying pedagogies underlying online courses
Successful implementation of e-Learning necessitates a two-tier training approach. The ‘learning’ which refers to pedagogical aspects, through which individuals learn, acquire and retain skills and information to facilitate knowledge development. The ‘e’ refers to technologies which communicates information to be learnt. This implies that the use of technology in itself does not cause or improve the quality of learning. To this effect, Garrison and Anderson (2003) assert that “to realize that potential of e-Learning as an open but cohesive system to support learning, it is essential that we rethink our pedagogy”.

Improving ICT skills
The level of ICT skills for both teachers and students affects the effective use of technology to support online instruction. For instance, Muilenburg and Berge (2005) point out that confidence and comfort in using ICT reduces barriers to social interaction, administration, learner motivation, and time. Therefore, the lack of relevant skills interferes with the learning process and often causes problems for both teachers and students.

Technology use
Miller et al. (2003) assert that “[the] arguments against online learning often focus on what is viewed as negative impacts from not having face-to-face contacts and anxiety caused by the nature and quantity of information transmitted through technology”. In this regard, reluctance of teachers in adopting e-Learning relates to their being too traditional in their teaching style, unwillingness to adopt change, or perceived increased teacher work load (Watson 2001).

Management support
Furthermore, e-Learning initiatives require full commitment and support from management for their operationalisation and sustainability. Successful transitions to more flexible modes of delivery require significant buy-in from senior management and a long-term commitment to support, foster, and monitor strategic change (Scottish Funding Council 2007). Marshall and Mitchell (2002) further point out the need to improve organisational processes associated with e-Learning. O’Hearn (2000) contends that university structures are rigid and unproven, regarding the incorporation of technological advancements.

6. Conclusion and future works

There is a strong need for identifying suitable strategies for effective e-Learning implementation and we have here provided a general overview of various theories for learning processes and methods. We have analysed some quite recent e-Learning implementation trends and discussed e-Learning implementation aspects.
More specifically, we have discussed e-Learning state of art, eliciting different implementation strategies indicating the continual evolution of e-Learning. We have also taken a look at e-Learning within a higher education context and emerging issues that have impact on its implementation. We, as many others, have noted that e-Learning implementations are serious commitments in a variety of ways, involving encompassing change processes which consider strategic, didactic, organisational, economic, and cultural dimensions for all stakeholders (Schönwald 2003).

From the emerging issues of e-Learning implementation within the higher education context, two problems emanate: 1) the limited uptake of technology as an instruction delivery method; and 2) the ineffective use of technology to support learning. In respect to this, future research should therefore seek to further investigate these aspects and to explore suitable approaches for effective implementation of e-Learning to support learning. Not the least in higher education contexts.

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Cultural Impact on Online Education Quality Perception

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Abstract: Numerous stakeholders in the field of education have been working on the development and extent of the use of ICT in different learning communities (higher education, vocational training) and in different multicultural contexts thanks also to EU funding opportunities.

In this framework, they have participated in the building of various cross-national teaching and learning models.

The strategies which supported the development of such educational projects introducing online teaching and learning activities in the framework of European projects generally rely on the basic premise of the homogeneity of the educational systems likely to be used, and according to similar methods, the resources and training devices with ICT. This can lead to the negation of potential discrepancies, particularly cultural ones, in educational systems.

The aim of this paper is to analyse the concept of “quality in online education within European Online Academic Education’s context”, how this concept takes shape and how it becomes – or not – part of teaching and learning practices. We decided to focus our attention on the concept of “quality” to understand the eventual impact of the cultural factor on the developing scenario of virtual education because this concept seems to be particularly revealing if we take into consideration its “open nature”.

The increasing number of virtual campuses reveals how common the development of teaching modules are nowadays together with complete degrees based on inter-university and transnational collaborations with the aim of transferring learning objects from one educational context to another. Virtual mobility is thus becoming a reality for a greater number of students.

However, the multicultural dimension of these new environments has not been investigated yet and in particular the notion of “online teaching quality” is still under-exploited.

This paper intends to provide a review of current works on Online Education Quality Measurement in general focusing on the investigation of Cultural Impact on Quality issues. At the same time this paper intends to shift the attention from students’ to teachers’ perception of quality and consequently on the possible different evaluation frameworks used within the same context: European Online Education.

The paper is part of a PhD research aimed at exploring the impact of cultural dimensions on the design of online courses offered by universities from different European areas. The research notably aims to reveal differences between online courses’ models, in order to uncover which one of them can be connected to the cultural dimension they belong to.

Keywords: cultural impact, cultural differences, quality, online education, virtual campus, virtual mobility.

1. Introduction

The aim of this paper is to develop a framework for the analysis of the concept of “quality in online education within European Online Academic Education’s context”, focussing our attention on its cultural dimensions.

A premise to the research activity is the analysis of the use of the term “culture” within the current literature. Good examples of definitions of the term “culture” can be found in Branch (1997): “Culture is regarded as the epistemology, philosophy, observed traditions, and patterns of action by individuals and human groups”, or Matsumoto (1996): “Culture as a set of attitudes, values, beliefs, and behaviours shared by a group of people, but different for each individual, communicated from one generation to the next”.

Referring to our research purpose, we recognized this use of the term culture to be too vague but consider as significant the interpretation of the concept of culture given by Flowerder and Miller (1995) who propose a cross-cultural interface composed of four elements or “cultures”:

- Ethnic culture: “socio-psychological feature which affect the behaviour of the students and which may contrast with the social-psychological make-up of Western lecturers”.
- Local culture: “aspects of local settings with which the members of a particular society are familiar”.
- Academic culture: “academic values, roles, assumptions, attitudes and patterns of behaviour common to the learners’ culture”.

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Disciplinary culture: “theories, concepts and norms, and so on of a particular academic discipline”.

We consider this approach to the notion of culture very useful as it represents a good example of how one can deal with this concept in a problematic way, avoiding the common trend to use the term “culture” as a synonym of “nation” and consequently to treat national cultural traits as systematically predictable behavioural patterns.

2. Context

The dazzling development of ICT during the last fifteen years has proved to be a societal revolution as much as a technological one because of its consequences on behaviours and forms of exchange. In the field of education, this increase in the power of ICT materialized, spurred on by the European Union, in the development of virtual mobility.

In this sense, the growing number of virtual campuses reveals how frequent nowadays, is the development of teaching modules, and complete degrees based on inter-university and transnational collaborations, with the aim of transferring learning objects from one educational context to another. Virtual mobility is thus becoming a reality for a greater number of students, teachers and institutions.

Focusing our attention particularly on the European context we can observe that - in the last decade - the European Commission has funded different projects aimed at building virtual campuses in Europe, encouraging the development of new organisational models for European universities and for European exchange and sharing schemes - virtual mobility.

The strategies which supported the development of such educational projects at a distance in the framework of European projects generally relied on the basic premise of the homogeneity of educational systems likely to be used, according to similar methods, the resources and training devices offered by ICT. This leads to the negation of potential discrepancies, particularly cultural ones, in educational systems. The other premise we can identify is the use of norms and standards in terms of conception and usage of material and pedagogical support in order to re-use, through different technical architectures, the same content bases.

The European Union defined clearly its vision of virtual mobility as follows: within a workshop that was part of the dissemination activities of the eLearning programme funded by the European Commission titled 'The 'e' for our universities - virtual campuses', three definitions which emphasize different aspects of a virtual campus were suggested:

- Collaboration perspective: the term "virtual campus" denotes ICT-based collaboration of different partners supporting both learning offers and research in a distributed setting;
- Enterprise (economic) perspective: the term "virtual campus" denotes an ICT-based distributed learning and research enterprise;
- Networked organisation perspective: the term "virtual campus" denotes an environment, which increases and/or integrates learning and research services offered by different partners.

This is the vision of the European Union, but not only the European stakeholders are engaged in promoting the diffusion of virtual mobility: several countries are developing their own internationalization policy for higher education (HEFCE 2005), in particular those belonging to the English speaking area: United Kingdom, United States, Australia and Canada. Examples of how a country like Australia deals with this issue has been analyzed in different publications: Globalization/Internationalisation of Online Content and Teaching, Australian Flexible Learning Quick Guide Series or the Quick Guide on Cross-cultural Issues in Content Development and Teaching Online.

This trend seems to reveal an “easy road” to a global educational scenario.

As Mason (2003) powerfully described, “Every day there are announcements of new companies being formed to market online and distance-taught courses, or new partnerships among existing institutions to broker courses and programmes both nationally and internationally. Just like airline companies, universities around the world are ‘partnering up’. There are a variety of reasons for forming partnerships or consortia of universities:

- sharing resources, costs and infrastructure to deliver e-learning;
competing with international providers;

- reducing duplication among existing universities”.

But is this really the direction that has already been taken? Are we all – teachers, tutors and students - going to deal with a borderless higher education (referring to the definition of 'borderless education' provided by the English Observatory on Borderless Higher Education: "The term 'borderless education' encompasses a broad range of activities and developments which cross - or have the potential to cross - the traditional borders of higher education, be they geographical, sectoral or conceptual")?

There are a lot of eminent voices to support this idea of a borderless education context. This kind of boundaries includes (Middlehurst 2002):

- levels and types of education, such as further and higher education, vocational and academic education, adult and continuing education; in some cases this represents a genuine effort to create seamless lifelong learning opportunities;
- private and public, for-profit and not-for-profit education: combining ‘public good’ and ‘private gain’ organizational structures and forms of provision;
- state and country boundaries, for example, between business and the public sectors and higher education, creating new corporate universities, transnational consortia as well as joint ventures and strategic alliances;
- boundaries of time and space in the creation of virtual learning environments, online learning programmes and e-universities.

Does this borderless scenario apply as easily? Are the educational actors (teachers, tutors, students, institutions, etc.) ready to face this change?

Some researchers do not totally agree with this assumption.

The first important contribution is Collis, Parisi and Ligorio’s (1996), who reports a list of barriers to effective online learning and global communication:

- cultural and environment problem;
- teaching style differences;
- problems of language and semantics;
- technical problems relative to platforms, operating systems and lack of standard interfaces.

As Moore suggests, behind educational traditions lie philosophical ideas. "These can vary significantly from one culture to another, and it is in these variations that lies the root of problems in cross-cultural understanding – and misunderstanding (Moore 2005)".

More recently and in the same vein, Banks (2006) offered us a meaningful analysis of a case that addresses the themes of cultural differences in e-learning, intercultural collaboration for joint development and understanding of e-learning, inter-cultural decision-making in e-learning and the impact of these factors on the professional development of members of the team. Banks strongly affirms how integrating pedagogical ideas to implement in the design of e-learning means more than identifying underpinning theories that inform particular learning and teaching practices. According to Goodyear (2001) it involves bringing together pedagogic ideas with methods, tools and processes for facilitating learning and is linked closely to the design of learning tasks and activities and the functionalities of the technologies being used. It also encompasses the existing context of learning and integration with existing learning and teaching practices that will inevitably be adapted and changed through its impact.

We collocate our research in the same trend of investigation: our aim is – in fact - to build a framework of analysis able to support the understanding of this phenomenon, and to verify whether and how teachers and tutors are aware of the possible cultural gaps and are prepared to face them (identify the critical success factors, barriers, and issues associated with globalisation/internationalisation of education).

3. Current literature

This chapter is dedicated to an analysis of the current literature on the themes investigated into this paper.
So the first review will be dedicated to the literature on quality issues and the second to the impact cultural differences on online education.

3.1 Online education quality measurement

As well described by Sanyal and MartinWhile (2007), traditional institutions are still playing a dominant role in providing higher education to meet the aforementioned needs, they are also changing their roles as follows:
- They are becoming partners in regional and international consortia.
- They have engaged in different forms of transnational education.
- They have joined virtual university initiatives.
- They are building partnerships with industries.

These different trends are responsible of a growing interest on the quality: internationalization policies and practices are lacking a quality assurance dimension and quality assurance approaches seems to be too much confined to national contexts.

Moreover: the concept of quality is not strictly defined and it has also evolved over time.

An analysis of the current literature allow us to identify a lot of different definitions of the concept of quality: excellence, exceptionality, perfection or consistency, providing value for money, conforming to specifications, getting things right the first time, meeting customers’ needs, having zero defects, providing added value, exhibiting fitness of purpose, transformation.

Going deeper into the definition of quality of online education the trend is confirmed: a systematic, formative methodology to measure and ensure quality is lacking. The most common tools for gauging quality are surveys and course evaluations in which instructors, learners, or sometimes administrators provide their perceptions, opinions, or experiences. Data collected from surveys or course evaluations only touch on some aspects of a course’s quality—mostly issues related to teaching and learning, such as how an instructor performs in class or how the learning experience affects learners. Often, aspects not obvious to faculty or learners are ignored, such as instructional design, course development, and the use of technology (Chao, Saj, Tessier 2006).

To be totally understood this phenomenon has to be connected to the fact that there are two types of quality assurance: internal and external. We have also to consider a variety of practices of quality assurance, among which three mechanisms can be distinguished. Also in this case the analysis provided by Sanyal and MartinWhile is useful.

The mechanism are: quality audit, quality assessment and accreditation.

The first and the last one are external mechanisms, while quality assessment could be both internal and/or an external mechanism.
- Quality audits examine whether an institution or one of its sub-units has a system of quality assurance procedures and determines its adequacy.
- Quality assessment involves evaluating (reviewing, measuring and judging) the quality of higher education processes, practices, programmes and services using appropriate techniques, mechanisms and activities.
- Accreditation is a process that usually results in the award of a recognition status (yes/no, a score on a multipoint scale, a combination of letter grade and score, an operating licence, or conditional deferred recognition) for a limited period.

Accreditation is the most widely used method of external quality assurance. And the trend seems to go toward accreditation, being perceived as the mechanism able to ensure a specific level of quality according to the institution’s mission, the objectives of the programme(s) and the expectations of different stakeholders, including students and employers.

Regardless of the quality model adopted, there are many methodological problems involved in measuring quality. Many characteristics of quality are not measurable and must be assessed through proxy variables.
Scores on ordinal scales are imprecise, and so are opinionated judgments.

Lee Harvey expressed serious reservations about accreditation when he stated: “Europe is rushing precipitously into accreditation and that the approach being taken is based on naive views of what accreditation is and what it can achieve. More fundamentally, there is an underlying but unspecified and unexamined set of taken-for-granteds that legitimate accreditation. Accreditation is neither neutral nor benign; it is not apolitical. Quite the contrary, the accreditation route is highly political and is fundamentally about a shift of power but a shift concealed behind a new public management ideology cloaked in consumerist demand and European conformity”. (Harvey 2004). So, from our point of view a growing consciousness about quality issues is needed, in particular among teachers and academics because even if this topic has acquired a relevant importance, it is expected to focus efforts in this way in the forthcoming period. In this sense quality must not stay anymore a concept at the level of mere bureaucracy. It should be able to signify something real and concrete that assures effective and measured results which will facilitate the training institutions to go further in their tasks, but to do this the main actors involves should acquire specific competences and awareness of all the variables involved, in particular the cultural ones.

Contextualizing our attention on the European region, we have to highlight the information provided by Ulf-Daniel Ehlers with his study ‘Use and distribution of quality approaches in European e-learning’ that was carried out as part of the EU-supported research project ‘European Quality Observatory’ (EQO) and provides detailed information about opportunities and difficulties in the area of quality development.

What is important to emphasize that the findings of the study demonstrate the need to develop a generally recognised standard which leads to certification of e-learning provision (or of providers). An outline of the main requirements for the formulation of such a standard can be summarised in the key words ‘participation’, ‘transparency’, ‘degree of familiarity and acceptance’, ‘openness’, ‘adaptability and scalability’, ‘harmonisation and integration’, ‘integrated methodology’, ‘quality awareness’ and ‘measurability’. At the same time this study shows clearly that although there are already a wide range of strategies and proposals for quality development, many of those involved in e-learning as decision-makers at an institutional or policy level, as teachers applying e-learning at the operational everyday level, or as media designers developing e-learning, as well as many users, demonstrate too little quality competence to meet the ‘quality’ challenge.

The existence of different quality models (ISO, EFQM, TQM, etc) serves as a reference for institutions to be engaged in this matter. This involvement may differ from one institution to another by a wide range of considerations. To begin with, it depends on the adopted theoretical options; the most frequents are the cited International Standards Organisation (ISO), the European Foundation for the Quality Management (EFQM) or the Total Quality Management (TQM).

Apart from these, there are other relevant actors of the process of standards’ definition: UNESCO/OECD, the INQAAHE, and the European Association for Quality Assurance in Higher Education but as has been seen, no standards have yet achieved general recognition in the field of quality management and quality assurance.

Taking into account this premise, an important contribution is given by Ehlers with his classification of standards, that – as we have underlined - are as numerous as the quality approaches themselves.

The standards can be classified according to the following features:
1. context: in what context is the standard developed and used (e.g. industries, sectors)?
2. purpose: what is the aim of the standard (e.g. more successful learning, better value for money, company targets, integrated objectives)?
3. quality dimension: what items are investigated (e.g. process orientation, product orientation or competence orientation)?
4. perspective: what actors are involved (e.g. learners, authors, administrators, external assessors, internal quality monitors)?
5. methodology: what methodology is followed by the standard (e.g. certification, guidelines, regulations, outlines, frameworks)?
6. measurement: how is compliance or success measured and checked (e.g. audit, document review, statistics)?
3.2 Cultural differences in online education

What emerged from an analysis of the literature (Milani 2007) on this issue is that the most evident feature is the almost exclusive focus on the cultural differences emerging from Western-non Western learning contexts, non-Western being, in most cases, Asian (Robinson 1999; Shattuck 2005) and to a lesser extent Arabian (Al-Harthi 2005) students.

Moreover the concept of “Western” is so wide and vague that it actually resembles the educational American model: the term “Western” is an inappropriate descriptor.

Another interesting element of reflection is that the most detailed studies belong, except for the USA area, to three territorial areas: UK, Australia and Canada, three countries that have been focusing their attention for a long time on the risk of a growing educational American imperialism (“American packaging of culture”), which finds in the Internet its propulsive push. The extent and seriousness of these studies are an indicator of the importance with which globalization is viewed by the higher education sector.

On the other hand, the major part of the current reflections on this issue seem to concentrate only on the students’ behaviour (Moore 2005; Pincas 2001) and only little attention is paid to the observation of cultural differences in teachers’ behaviour and practices.

The main concept of the current research seems to be the “educational globalization”. Mason (2003) in particular, identifies some elements of the educational scenario associated with this concept: international communications based on telecommunications, information and media technologies, which facilitate transnational circulation of text, images and artefacts,

- international movement of students to study in other countries as well as a demand for online courses without a residency requirement in another country,
- increasing multicultural learning environment whether online or on campus,
- increasing global circulation of ideas and particularly Western pedagogical Systems and values,
- a rise of international and virtual organizations offering Web-based education and training.

One of the more relevant contributions in this field of research can be identified in the paper written by Claire Bélisle “eLearning and Intercultural dimensions of learning theories and teaching models”, where the author describes how “designing elearning environments has required that educational actors clarify, rationalise and formalise their practices. In order to introduce mode coherence and relevancy, implicit cultural assumptions have had to be revisited, bringing about a deeper awareness of the kind of learning that schools and universities are specialised in and of the underlying choices of values and beliefs. In multicultural and multilingual societies, the implicit pedagogical assumptions of eLearning environments need to be made explicit” (Bélisle 2007).

The real improvement of this trend of research is recognizing that in uncovering the learning theories that organize the pedagogical practices, it is the whole pedagogical culture of teachers that is brought into light. More research is required in this direction: there’s a growing weight of stressing the need for educational actors to become aware of the cultural embeddedness of their activity, in traditional teaching as well as in online teaching.

But also in this field, we have to be aware of the risks highlighted by Lee Harvey referring to the quality issues: also when we talk about the need to develop an awareness of the cultural embeddedness of pedagogical practices we have to face – at the same time – the process of attempting to absorb other pedagogical practices into an increasingly narrowly defined and hegemonic north European culture, within the European context, and an even more hegemonic American teaching culture. What is happening nowadays seems to indicate a tension between visions, one of a movement towards a hegemonic culture, the other seeing the emergence of a more multi-cultural context.

Last but not least, we want to point attention to the e-Quality project, that was carried out with the support of the European Community within the Action MINERVA of the Programme SOCRATES (110231-CP-1-2003-FR-MINERVA-M) and gathered five European Countries, representing six academic institutions. The e-Quality project was one of the first actions aimed at facing what is cultural and organisational diversity among European Higher Education, it could be considered one of the first researches which combine the attention of both cultural and quality issues in Higher Education.
The e-Quality project started with the comparative analysis of the partners’ context that allows awareness and detects a set of existing blocking factors in the implementation of quality.

National studies have been conducted in the five countries, using this common questionnaire.

Five reports and a synthesis have been written and are available on the project website. The synthesis includes also an interesting comparison on blocking or helping factors for quality implementation in Higher Education institutions, in general and for ODL in particular [Dumont, Sangrà 2005].

In the frame of the e-Quality project through a collaborative work, a set of criteria and indicators are being developed. The idea is offering guidance enhancing the improvement of ODL higher institutions in quality terms. Furthermore this information may be considered as key success elements when implementing quality methodologies.

We can consider this project as a very good example of investigation of the context but what is still under-exploited is the deep analysis of the impact of cultural differences on the generation and management of quality issues in European Higher Education; in this field other research is required.

4. The research issue

To understand the potential impact of the cultural factor on the developing scenario of virtual education we decided to focus our attention on the concept of “quality”, that seems to be particularly revealing because of its “open nature”. As we have emphasized in the previous chapter, there is indeed no normative definition for quality, which is why to understand which notion of quality has a direct impact on teaching practices we should start by understanding how teachers – first of all - evaluate the quality of an online course.

4.1 What does quality mean?

As described before, the greatest challenge when trying to define quality in any product or service is the relativity of the “quality” experience, as it mainly depends on an individual’s level of expectations.

To go deeper into the analysis of the concept of quality, the Quality Decision Cycle of the European Quality Observatory is a good starting point.

Ehlers (2006) adapted this cycle by identifying four steps users have to engage in to develop quality: knowledge about quality development for general orientation and selection, experience with the usage of instruments for quality development, ability of innovation and modification to adapt instruments and concepts to their own situation or develop new and analysis abilities for assessing needs and evaluating existing tools and concepts.

But does the term quality – as used within this specific context - always refer to the same meaning?

We propose (Milani 2007) to reflect on four different “dimensions of quality”:

- First level - Expected quality: It is the ideological dimension (What I – as a teacher – think is the best for me and the other actors)
- Second level - Operational quality: It is the level that defines how the teacher invests in what he/she thinks is “the best”
- Third level - Achieve quality :It is what “in fact” has been done about quality
- Fourth level - Perceived quality :It is what the users (may be also the other teachers) think about the quality level of the course.

5. Methodology

Figure 1: Quality perception
As expressed in Figure 1, the way quality is perceived is the result of the differences between the quality expected and the quality observed. Consequently the two issues to investigate are: how does a teacher develop his/her own idea of quality; how does a teacher measure quality?

We have to face the two following methodological problems: build research tools to understand how the idea of quality develops, and tools to understand how teachers measure the quality on an online course.

For both these research issues, a qualitative approach seems to be the most appropriate.

5.1 Develop an understanding of how the notion of quality in an online course emerge

As previous analysed in Chapter 3, the term “quality” is often understood – even in the literature - as shorthand for Totally Quality Management (TQM), thus adopting the business model associated with this term.

Another relevant way to think about quality is the reference to the ISO model: in 2005 the ISO/IEC 19796-1:2005, the ISO/IEC standard benchmarks for e-learning appeared and has been presented like the new international standard aiming at harmonizing the various approaches used around the world for assessing the quality of e-learning initiatives.

In the same years, the formulation of quality assurance systems of online education, while most frequently regulated at a regional or national level, has been driven by international developments.


Most of these frameworks present a great number of tools and guidelines on the procedures to assess products and processes, distinguishing among the processes related to the service dimension and the processes related to the teaching and learning dimensions.

How much of this large amount of information, suggestions, benchmarking, guidelines etc. really impacts on the notion of quality that each single teacher applies in his/her teaching practice?

The only way to answer is to investigate this issue directly with teachers, taking into account that interviewing teachers from different countries implies a parallel analysis of their country’s approach to quality.

5.2 Develop an understanding of how teachers measure quality

To analyse this level of quality we should develop a way to collect information directly from teachers, asking them to explain what they consider to be an indicator of quality for an academic online course. Therefore teachers will be invited to list their indicators of quality and to define their weight into the design of a quality measurement.

We have to take clearly into account that in the European context teachers are not used to evaluating explicitly the quality of their courses and – at the same time – evaluating other teachers’ courses. There is a commonly developed experience (from the very beginning of an academic career) to evaluate and be evaluated only from a research point of view and research results will determine the career of a teacher.

This behaviour has had a direct impact also on the constitution of the international research community. We cannot say the same about the existence of an international teaching community.

One of the few cases of peer teaching assessment can be found in teaching rewards in some universities (mainly in the Anglo-Saxon area). However, even in the case of teaching rewards, the peer assessment is only part of the total assessment and never the most relevant one.

Referring to these premises, what specific methodology should we use to investigate how teachers evaluate their own course and their peers’ courses?
What variables do they use to assess the quality of an online course? And what are their relative weights?

We are going to collect data from interviews with teachers using the following structure:

- What rules do you follow to try and design a good online course?
- What are the variables you look at to evaluate the quality of a course?
- What are their relative weights?
- Can you give us an example of a good online course?
- Why do you think that this course is of good quality?
- Can you give us an example of a low quality online course?
- Why do you think that this course is of low quality?

5.3 A case study: the e-LERU Virtual Campus

The e-LERU virtual campus is an initiative of eight European universities, all members of the League of European Research Universities (www.leru.org) whose objective is to share teaching and learning experiences at a European level.

The eight universities involved in this project are: Université Louis Pasteur, Università degli Studi di Milano, Katholieke Universiteit Leuven, Ruprecht-Karls-Universität Heidelberg, Karolinska Institutet, Stockholm, Universiteit Leiden, Université de Genève, Helsingin yliopisto.

The aim of the e-LERU project (www.eleru.leru.org) is to create a virtual campus as a common e-learning offer, enabling each partner university to offer its students virtual mobility (by means of teaching modules from other partner universities to be undertaken through distance learning), as a complement, or in preparation to physical mobility.

This project represents a perfect case study for our research because it will give us real significant data to answer some of our research questions.

We will focus our attention on two segments of this project that are relevant for our research: the certification scheme adopted by the partners and the quality guidelines designed and adopted.

5.3.1 The e-LERU Certification Scheme

The e-LERU partners are all involved in the implementation of the ECTS (European Credit Transfer System) credit system, even though they are not at the same stage of its implementation. However, as far as student mobility is concerned, they all decided to rely on the procedures used within the Erasmus programme, as a recognised best practise of European mobility.

In the framework of our research, the most relevant document is the e-LERU description form that the teacher has to fill in to describe his/her e-module.

To build the e-LERU description form, the partners decided to focus this description on the learner and therefore always reflect in terms of learning outcomes.

These are the information available on the form:

- Course-Module Name
- Course-Module Code
  ECTS credits
- Duration
  Term
  Type
  Language
- Prerequisites
  Post requisites
This form is the main element a university will use to decide whether it is interested in integrating an e-module in its curricula: the first analysis of the quality of an e-module clearly comes down to one or more teachers.

5.3.2 The e-LERU quality process

The concept of a virtual campus built on the existing LERU (League of European Research Universities) network should however be synonym of “excellence”. To this end, the setting up of a formal quality process was necessary to ensure the quality of e-LERU outcomes. This quality label is established through a specific quality process which should apply to the e-learning modules (also named “e-modules”).

The method defined by the partnership to design the quality process for the e-learning modules was not created from scratch but was empirically established on the basis of other similar experiences and the international standard ISO 19796, dedicated to quality management in the field of education and training.

A quality process consists of four stages:
1. Identifying the main steps the partners have to go through to develop e-learning modules;
2. Identifying the milestones which mark out the development of e-learning modules;
3. Identifying the quality criteria which will define the e-learning modules;
4. Identifying the assessment and evaluation tools (survey, questionnaire, etc) which will be used to make sure that quality objectives have been achieved.

These characteristics naturally lead to the following list of quality criteria to be applied to e-modules:
- the e-module is compliant with ECTS (European Credit Transfer System) guidelines
- the e-module is fully described
- the ECTS grading policy is transparent and easy-to-understand
- feedback to student assignments and questions is ensured (constructive and provided in a timely manner)
- instructional materials are self-contained and presented in a format appropriate to the online environment
- technologies required for the e-modules are specified and provided (or easily downloadable)
- copyrights are respected
- usability and accessibility have been taken into account.

Our analysis of this case study will now follow these stages:
First step: we will have interviews with teachers involved in the design and/or adoption of an e-module (being part of the offering or of the receiving institution) to analyse how these teachers evaluate their e-modules and
the ones designed in other universities. To complete this task we are going to manage the interviews following the structure presented into the paragraph 5.2 of this paper.

Second step: we will try to understand how this kind of “general quality guidelines” really become part of the teaching practice and which quality issues are tacit. We will try to make them explicit and to understand if there are cultural differences in the way they evaluate quality and therefore to deal with the teaching and learning activity.

Through this case study we are going to validate the methodology of research that we are going to adopt to investigate other virtual campuses experiences.

6. Future research

This article raises a number of questions, some for future research and some with concrete implications. One question is central to a better understanding of what quality, within the context of online education, means: how teachers – first of all - evaluate the quality of an online course.

A second stage could be the mapping the variables used by the teachers involved into virtual campus activities to describe their perception of quality and the comparison. Then this mapping should be compared with the mapping of the variables involved into the “official” construction of the standards (referring - of course - with the processes related to the teaching and learning dimensions and not to the institutional dimensions of quality measurement).

Only after these further levels of analysis it will be appropriate to start the investigation of the connections between the mapping of quality variables and cultural differences, adopting the interpretation of culture indicated in the first chapter of this article: a cross-cultural interface composed of four elements or “cultures”: ethnic culture, local culture, academic culture, disciplinary culture.

7. Conclusion

In the current scenario, characterized by an increasing number of virtual mobility experiences – from teachers’ as well from students’ point of view - and by a rhetoric of a 'borderless education', it is relevant to turn this phenomenon into a crucial issue to investigate and reveal the existence of potential cultural differences. By simply recognizing these differences, educational actors will be able to face them and consequently to optimize their teaching and learning practices.

Through this paper we have proposed a review of the current literature on quality issues in online European education and also on the impact of cultural differences in online teaching and learning practices. We also tried to shift the attention from students’ to teachers’ point of view to reveal potential cultural differences in the perception of the quality of an online course.

We focused our attention on the notion of quality because we strongly believe that it could be a litmus paper of some “removed” or implicit or tacit assumptions able to influence the results of a teaching and learning experience within a context of virtual mobility.

The next steps of this research will be the validation of our research methodology that should enable us to identify the eventual impact of cultural differences on the development of online courses starting from concrete studies on projects integrating ICT in higher education in the European context.

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Meeting the Training Needs of SMEs: Is e-Learning a Solution?

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Abstract: Training is one of the basic means of human resources development in business organizations, aiming to motivate employees, to develop their potential and to help them perform better. The end of the 20th century has seen the advent of globalisation and the diffusion of new information and communication technologies. Businesses have to change and adapt to the requirements of the new knowledge-based and skill-based economy. Facing pressures from an increasingly competitive business environment, small and medium-sized enterprises (SMEs) are called upon to implement strategies that are enabled and supported by information technologies and e-business applications in order to compete with others’ organizations. One of these applications is e-Learning, whose aim is to enable the continuous assimilation of knowledge and skills by managers and employees, and thus support organisational training and development efforts through the use of the Internet and Web technologies. Little is known however as to the level of awareness of e-Learning in SMEs and as to the actual role played by e-Learning with regard to these firms’ training needs. A multiple case study of sixteen SMEs in the Atlantic region of Canada, including twelve that use e-Learning with varying degrees of intensity, was designed to explore this question. We observed the firms’ training process, identifying to what extent the SMEs know and use e-Learning, and to what extent e-Learning meets their training needs.

Keywords: e-Learning, training, SMEs, training needs analysis, learning, workplace learning

1. Introduction

In a knowledge-based economy, the performance of business organizations depends on ensuring that all categories of employees possess current and up-to-date knowledge and skills (OCDE, 2002). Therefore, the new knowledge and information-based economic system implies a strategic role for the training function, and has significant implications for the identification of training needs and the delivery of training. Now, businesses must analyze their training needs in greater depth and train a larger number of employees with different backgrounds in terms of knowledge and experience, and they have to do so more rapidly than in the past, while attempting to reduce training costs to remain competitive in a complex and changing environment. For their part, employees also must be constantly in a learning mode, in order to increase their knowledge and improve their skills. As a result, training habits have to change, for both organizations and their employees. Thus many large enterprises have turned to e-Learning as a “best practice” aimed at providing adequate training to their employees so they can remain up to date and competent in their jobs (Hall and LeCavalier, 2000).

But what about small and medium-sized enterprises (SMEs) in this regard? In the Atlantic region of Canada for instance, these firms represent about 80% of all business organizations, create about 80% of the jobs, and are considered as the mainstay for the region’s economic development (Brady, 1995; ACOA, 1998). But SMEs are organisations that show specificity in terms of their environment, strategy, structure, technology and culture, and differ markedly from large enterprises with regard to their training and development needs (Vickerstaff, 1992; Winch and McDonald, 1999) and their resources and capabilities (Vinten, 2000). While attempts have been made to implement e-Learning applications designed for SMEs (Mullins et al, 2007), and to identify the impact of e-Learning on the performance of these organizations (Little, 2001), there is as of yet insufficient empirical evidence and understanding to support the use of e-Learning as an efficient and effective solution to the training problems of SMEs (Welsh, Wanberg, Brown and Simmering, 2003). Therefore, two questions arise: What is the present level of awareness and use of e-Learning in SMEs? And to what extent are SMEs using e-Learning to identify and meet their training needs?

The aim of this research is to explore these two questions, through a multiple case study of 16 SMEs located in the Atlantic region of Canada.

2. Research background

While one should be cautious in interpreting trend watching reports (Boon, Rusman, van der Klink and Tattersall, 2005), the adoption of e-Learning technology for purposes of workplace training and human resource development is rapidly growing in large organisations, both private and public, and to a lesser extent in SMEs (Beamish, Armistead, Watkinson and Armfield, 2002; Misko, Choi, Hong and Lee, 2004).
practitioner literature, adopting a “best practices” approach for the most part (Hall and LeCavalier, 2000), has focused on issues of cost and technological issues; whereas research on e-Learning in the workplace is deemed to require a better theoretical grounding (Daelen, Miyata, Op de Beeck, Schmitz, van den Branden and Van Petegem, 2005), a broader conceptualization of e-Learning’s impact on the organisation and its individual members and, in particular, “a broader understanding of workers’ learning and affective needs” (Servage, p. 304). Attempts have thus been made to identify the contextual conditions, pedagogical prerequisites, methodologies and design principles for the successful implementation of e-Learning in SMEs (Tynjälä and Häkkinen, 2005; Lawless, Allan and O’Dwyer, 2000; Moon, Birchall, Williams and Vrasidas, 2005).

2.1 Definition of e-Learning in the workplace

In the absence of a clear and common definition of e-Learning, along with the presence of related terminology such as “computer-based training” and “distance learning”, conceptual ambiguity and problems of comparability can be encountered when this concept is used for research on workplace training (Pailing, 2002; Servage, 2005). The definitions most often provided link learning activities and technologies. In this line of thought, Abram (2003) defines e-Learning as basically using the Internet, an intranet, an extranet, or other Web technologies to provide training to individuals in a synchronous or asynchronous mode, while for Welsh, Wanberg, Brown and Simmering (2003), it is defined as “the use of computer network technology, primarily over or through the Internet, to deliver information and instruction to individuals”. A report by the American Commission on Technology and Adult Learning (ASTD, 2001) states that “e-Learning is instructional content or learning experiences delivered or enabled by electronic technology”. The Conference Board of Canada’s (2001) workplace e-Learning report provides that “e-Learning uses information and communications technologies (ICTs) to deliver content (learning, knowledge and skills) on a one-way (asynchronous) or two-way (synchronous) basis”. Terry (2000) defines e-Learning as “the ability to deliver training and education via Web technology”. It is meant to improve training by providing current content anytime, anywhere, and offering learners a customized, interactive, just-in-time experience. For Gill (2000), e-Learning comprises all training activities that use Web technologies.

E-learning typologies that combine certain characteristics or criteria have also been developed by some authors (Abram 2003; IDC 2004; Servage, 2005). Those characteristics most often used are: time, place, access and support, technology (development and delivery), interaction, personalisation and control (Piccoli, Ahmad and Ives, 2001).

2.2 Purported benefits of e-Learning for SMEs

Training in SMEs is deemed to benefit from e-Learning for various reasons, both economical and technical (Tyler, 2001). This includes reduced travel costs, training needs being met at a more appropriate time for the organization and its employees, and not having to replace employees during work hours. Servage (2005) mentions that e-Learning provides for a higher personnel retention rate, while Rosenberg (2002) notes a faster distribution of training materials and a more consistent delivery of course contents. Pantaziz (2002) mentions that e-Learning reduces training time and can lead to increased employee productivity and business performance. The various benefits of e-Learning are summarised in Table 1, a number of empirical studies having confirmed their existence. For instance, it was found that some firms believe the two main benefits of e-Learning to be its capacity to support access to training from the workplace, thus reducing the time spent outside the work area, and its capacity to structure the training in small modules that can better meet the training needs of employees (Industrial and Commercial Training 2001). For employees, the main benefits of e-Learning were found to be its convenience and the opportunity to learn at their pace. Another study found that a majority of firms perceived e-Learning as being an economical, efficient, flexible, practical and time-effective mode of training (Journal of European Industrial Training 2002).

Frison (2001) adds that e-Learning represents an “added value” as compared to conventional training methods. This is particularly important for SMEs, given that the main conclusion obtained from the empirical research to-date is that, in a globalised knowledge-based economy, there are a number of unresolved problems that still beset these firms with regard to workplace learning, and in particular there is still great difficulty in providing education and training that meet the specific needs of SMEs, their owner-managers and their personnel (Dawe and Nguyen, 2007).
Table 1: Benefits of e-Learning as a function of its characteristics

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flexibility and accessibility (availability)</td>
<td>Possibility for the employee and the firm to choose a course’s time (any time – 24 hours a day / 7 days a week) and place (any location) (Bélanger and Jordan 2000; Britt 2004; Cutshall 2002; Kenyon 2002; Melymuka 2002; Nonprofit World 2002; Perez and Foshay 2002; Phillips 1998; Rosenberg 2002; Sloman 2001).</td>
</tr>
<tr>
<td>Modularity</td>
<td>Possibility for the employee to only complete the part of the course that pertains to his needs and not the entire course (Britt 2004; Emmond 2005; Melymuka 2002), along with the possibility of working on the course sections that are not as well understood (Youngers 2002).</td>
</tr>
<tr>
<td>Speed</td>
<td>Possibility for each employee to learn at his or her own speed (Davis 2001; Nonprofit World 2002; Perez and Foshay 2002; Phillips 1998).</td>
</tr>
<tr>
<td>Privacy</td>
<td>Possibility of completing the course alone at home (privacy) and of not having to suffer the discomforts (shyness, feeling of lack of knowledge, etc.) that some employees experience from time to time (Perez and Foshay 2002).</td>
</tr>
<tr>
<td>Interactive feedback</td>
<td>Possibility of having an instructor and personalised support by this instructor, and of getting feedback by various means (telephone, fax, email, camera, etc.) (Bélanger and Jordan 2000; Melymuka 2002; Perez and Foshay 2002).</td>
</tr>
<tr>
<td>Cost</td>
<td>Reduction in training costs (course fees, transportation, meals, lodging, time away from work). There are numerous courses already developed in e-Learning format that are free or available at reasonable prices. These courses, in addition to being less expensive than conventional courses, allow SMEs to save on travel, lodging and meal costs. These courses reduce the loss of employees’ production time or the need to replace employees (Bélanger and Jordan 2000; Britt 2004; Kenyon 2002; Kolbasuk McGee 2003; Masie 2000; Melymuka 2002; Pantazis 2002; Phillips 1998; Rosenberg 2002; Terry 2000; Youngers 2002).</td>
</tr>
<tr>
<td>Learning style</td>
<td>Possibility of presenting the course material in various formats and meeting the various learning styles of employees (Bélanger and Jordan 2000; Melymuka 2002; Young 2002).</td>
</tr>
<tr>
<td>Customisation</td>
<td>Possibility of customising the training according to each participant’s needs (Sloman 2001; Youngers 2002; Zahner 2002).</td>
</tr>
<tr>
<td>Evaluation</td>
<td>Possibility of evaluating employees’ progress on a continuous basis (Britt 2004; Emmond 2005; Kenyon 2002; Youngers 2002).</td>
</tr>
<tr>
<td>Distribution of training material</td>
<td>Faster distribution of the training material (Rosenberg 2002).</td>
</tr>
<tr>
<td>Consistent delivery</td>
<td>Consistent delivery of the content of the course, from one time to another (EIU 2004; Halkett 2002; Rosenberg 2002).</td>
</tr>
</tbody>
</table>

3. Research method

Given the present state of knowledge on e-Learning in SMEs, a qualitative and exploratory research approach was used. The case study method is well adapted in situations where theoretical propositions are few and field experience is still limited (Yin, 1994). A multiple-site case study allows one to understand the particular context and evolution of each firm with regard to e-Learning. Sixteen SMEs located in the Atlantic region of Canada were studied, that is, four in each of the provinces of New Brunswick, Nova Scotia, Prince Edward Island and Newfoundland, selected to be sufficiently successful (at least 10 years in business) and representative in terms of industry and size, for theoretical generalization purposes. Following North American research (Mittelstaedt, Harben and Ward, 2003; Wolff and Pett, 2000), a small enterprise (SE) is defined as having 20 to 99 employees, whereas a medium-sized one (ME) has 100 to 499.

Data were collected through semi-structured tape-recorded interviews with the owner-manager or CEO and with the firm’s HR manager or manager responsible for training. e-Learning users were also interviewed in four cases. Interview transcripts were then coded and analyzed following Miles and Huberman’s (1994) prescriptions. For reasons of confidentiality, fictitious names of individuals and firms participating in the study were used. As presented in the research results section, these firms range in size from 60 to 485 employees and operate in industries whose technological intensity varies from low to high. All export except for one firm (M). The SMEs were regrouped in four e-Learning profiles of increasing intensity, based on the extent of their awareness and use of e-Learning (none, weak, average, strong).
4. Research results

4.1 Awareness and perceived benefits of e-Learning in SMEs

The majority of the SMEs who participated in the study are quite aware of e-Learning and offer definitions that closely resemble those that are found in the literature. As indicated in Table 2, while the e-Learning concept is fairly well known by the majority of SMEs studied, it remains to be defined for some.

Table 2: Illustrations of e-Learning definitions offered by SMEs

<table>
<thead>
<tr>
<th>Definition</th>
<th>SME</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;It is any kind of system that allows you to learn a skill through the computer and basically, Internet, an interactive software or text notes; text notes would be the worst case scenario and some kind of an interactive software that would give you results and test questions and so on….pick and choose kind of thing, so you can actually see if you are taking the right decisions.&quot;</td>
<td>Bert</td>
</tr>
<tr>
<td>&quot;E-Learning is learning through a computer program, with a computer program on-line. It is almost like distance education whether it is local or not but it is obviously something you can do on a computer system as opposed to going to a building.&quot;</td>
<td>Fiona</td>
</tr>
<tr>
<td>&quot;I am not familiar with the proper term but I suppose it is e for electronic.&quot;</td>
<td>Gilbert</td>
</tr>
</tbody>
</table>

Further analysis enables us to qualify the SMEs' stated knowledge and use of e-Learning, as these firms can be categorized under four distinct profiles. There are SMEs that have a strong, average or weak knowledge and use of e-Learning, and those whose knowledge is minimal and use is nonexistent, as indicated in Table 3. Evidently, SMEs that make greater use of e-Learning have a better capacity to define it.

Table 3 also shows that several SMEs in Atlantic Canada use e-Learning, up to a certain degree, to train their employees. During this study, 75% of SMEs were using e-Learning to train their employees. This tends to confirm what is indicated by Bassi and Van Buren (1999), i.e. that Internet and Web-based training methods are being increasingly used by SMEs. An interesting fact to note, in the case of a "weak" use of e-Learning by SMEs, it is usually the employee who has chosen to develop his/her knowledge through e-Learning. Julien (firm J) provides an example “Some employees have chosen e-Learning, but it is usually on an exception basis, to develop their work knowledge and it was suggested by the employee and not the employer.”

Table 3: Profiles of e-Learning awareness and use in SMEs

<table>
<thead>
<tr>
<th>Profile (SMEs)</th>
<th>I - strong (C, D, K, L)</th>
<th>II - average (B, E, M, O)</th>
<th>III - weak (A, F, I, J)</th>
<th>IV - non-existent (G, H, N, P)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size No. of employees</td>
<td>300 to 485</td>
<td>60 to 280</td>
<td>150 to 350</td>
<td>75 to 400</td>
</tr>
<tr>
<td>E-Learning Utilization</td>
<td>Strong</td>
<td>average</td>
<td>Weak</td>
<td>non-existent</td>
</tr>
<tr>
<td>E-Learning Knowledge</td>
<td>Strong</td>
<td>average</td>
<td>Weak</td>
<td>none-existent</td>
</tr>
</tbody>
</table>

Note. A “strong” use means that the firm regularly uses e-Learning to train its employees. An “average” use means that the firm has developed at least two courses in e-Learning format and that production employees must take these courses. A “weak” use means that only a few employees use e-Learning. A “non-existent” use means that the firm does not use e-Learning to train its employees.

The decision to use e-Learning by the employees in order to further develop their knowledge is linked to their perceived benefits of e-Learning. Fiona (F) provides us with an example: “The employee chose this method because she wanted to continue working; she needs to work; she wanted to complete her bachelor’s degree while working at the same time”. Denise (D) gives us another example: “Since I have a three year-old daughter and that my work schedule is rather full, I can complete the work at 3:00 AM in my slippers. Honestly, I chose e-Learning because of the flexibility”. As for the choice of SMEs to use e-Learning to train their employees, that decision is also a function of the benefits they may obtain from e-Learning. To this effect, table 4 illustrates different statements regarding the perceived benefits of e-Learning by SMEs who use it. These benefits are basically the same as those described in the literature (Table 1). These are not only perceived benefits but realised benefits that motivate SMEs to further use e-Learning for training purposes.
4.2 Use of e-Learning in SMEs

All SMEs who participated in the study did in fact analyze their training needs, contrary to what has been mostly reported in the literature. What varies from one SME to another is the degree of formalization and rigour with which the analysis is carried out, and the sophistication of the tools used. In some cases, the analysis of training needs is carried out with less rigour and fewer tools. Helen (H) provides us with an example “I think that department heads already have a good idea of what employees need with regard to training, or what they would like them to have, as they make an evaluation every six months”. In other cases, however, the degree of rigour is high and the tools used are quite sophisticated. Denise (D) gives us an example “We use what we call a skill gap analysis supervisory road map”. Table 5 presents, in more detail, the tools used by each SME to analyze its employees’ training needs, the degree of formalization and rigour of this analysis, and whether this analysis is made in a holistic manner, that is, with regard to the firm’s strategic objectives.

SMEs that make greater use of e-Learning and ICTs in general, i.e., firms C, D, K and L (profile I), are seen to conduct much more formalized and rigorous analyses of their training needs. They use more sophisticated tools; some even use learning management systems (LMS) or other software for this purpose. They also identify training needs earlier, that is, either when employees are hired or soon after. Claude (C) gives us an example:

“The training needs analysis is done when we hire them; it is done before they start to work. We use a Learning Management System”.

Also, the greater their awareness and use of e-Learning, the more SMEs tend to analyze their training needs in a holistic manner, that is, to identify them in conformity with the firm’s strategic objectives and planning. Karen (K) gives us another example:

“The general manager decided to include training needs in the annual business planning and in the development plan of the company. Top-management realises the importance of continuous learning
We made the analysis according to our planned objectives. We have software in human resources”.

Whereas SMEs which do not use e-Learning, i.e. firms G, H, N, P (profile IV), mostly use performance evaluation as a tool to analyze their employees’ training needs. This tool is used either to determine if employees can carry out in a satisfactory way the tasks that are assigned to them, that is, to determine if training is necessary. As mentioned by Patrick (P):

“We do not really do an analysis of training needs but we identify what employees need when we hire them. We train them when we hire them; we train them directly on the machine. We estimate their performance during a three-month probationary period to make sure that they can operate the equipment. We give more training when it is necessary to make sure that they can do their job correctly and efficiently”.

Nathalie (N) makes similar remarks:

“During performance evaluation, we identify an employee’s training needs such that the work is done correctly, but there is no ‘analysis’ as such”.

Gérôme (G) goes further:

“For production employees, we don’t really do an analysis because their training needs are known. We have employees that have been with the company for 30 to 40 years... If we notice, after a few weeks, that an employee does not meet standards with a new machine, then we make changes and give training to that employee. We can’t allow a machine to run at 50 % efficiency”.

Also, SMEs where e-Learning is non-existent conduct a less formalized and rigorous analysis of training needs, and this analysis is not specifically related to the attainment of the firm’s objectives. Whereas SMEs that make average use of e-Learning, i.e. firms B, E, M, O (profile II), and those that have a weak level of use, i.e. firms A, F, I, J (profile III), use a varied range of tools to make such an analysis. In this regard, Ivan (I) says: "We use a combination of tools to analyze our training needs". Adds Jules (J): "Various means are used. We have also committed ourselves to having the trade-union representatives form a committee that will identify where the gaps are”.

Training needs identified by SMEs are varied and depend upon each company’s area of endeavour. They can be divided into two main groups: interpersonal skills and technical skills. The following training needs were mentioned: team work and respect of others, coaching skills, facilitation of meetings, leadership, effective communication, interpersonal skills, problem solving, stress management, anger management, valued-added activities, regulatory training (pollution, environment, and health), management, computers and technologies, time management, job orientation, health and safety at work, continuous improvement, higher technical skills, performance and quality management. Some SMEs encounter difficulties when they want to fulfill their training needs and some are sometimes unable to do so even when they know how. One of the benefits of e-Learning use in SMEs is precisely the possibility of having access to training products and services that would be otherwise unavailable, as indicated in Table 6.

The development of courses internally, in an e-Learning format, is also another way for SMEs to meet their training needs. Says Bert (B): “We developed some courses on our own, especially those related to regulatory training”. Denise (D) adds: "We developed a partnership with a company specialized in our field to develop our courses. Each one is comprised of 60 % general material and 40 % material specific to our company”.

5. Conclusion

In evaluating the feasibility of e-Learning in their firm, the managers interviewed in this study allude to a number of pre-requisites that could constitute the core of an action plan to further enable e-Learning in their organisation. The first such pre-requisite mentioned is the need to develop an e-Learning culture within the organisation, where managers and employees are truly motivated and committed to use e-Learning because they believe it is essential to their individual development and their organisation’s development. This implies greater awareness and promotion of e-Learning’s value through the dissemination of knowledge among SMEs as to the nature, possibilities and advantages of e-Learning for workplace training, and as to the supply and appropriateness of e-Learning services and products available. A second pre-requisite mentioned by the respondents is the necessity to lower the present barriers to the efficient and effective use of e-Learning by SMEs. This implies that employees possess the computer knowledge and skills required to use e-Learning effectively, and that they be provided with e-Learning software that is user-friendly and appropriate to the task at hand. This also implies better management and technical support of employees with regard to e-Learning, support which was found lacking in a number of SMEs.
Table 5: Formalization, rigour and tools used to make the needs analysis

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Table 6: Illustrations of e-Learning as a solution to meet the training needs of SMEs

"There are not many opportunities in this area when it comes to training or higher education; therefore we have to investigate other alternatives." Arthur (A)

"We don’t have an MBA accessible in this area. The online MBA either from Athabasca, Royal Roads or other universities gives us the opportunity to access training that otherwise would not be available." Denise (D)

"It opens up the door to a lot of training that would not be available otherwise. We are in a remote area, therefore we’re not going to get or be offered the same types of courses than in urban areas because there’s just not the market for it here. It enables us to have access to the same types of, you know, knowledge and education as the larger centres." Marie (M)

"Availability. We tried to book conventional courses in an educational institution and we had to cancel three separate courses for two, I mean six courses in total that were cancelled. We said that’s it, we have to find another way around this thing because three months went by and there was no training. The person was basically useless and was moved to another job." Ivan (I)
Globalization and the internationalization of markets have increased competitive pressures on SMEs. This has led some companies to engage in training projects that are critical to their becoming “world-class” enterprises. While e-Learning is becoming increasingly common in organisations, very little is known of the extent to which this technology is used by SMEs in their training process, and of the extent to which e-Learning can meet these firms’ training needs. This research has attempted to describe and understand the role played by e-Learning in identifying the training needs of SMEs. Facing competition in a global economy that is based on knowledge, and under pressure from their most important business partners, many of these firms must attain increasingly higher levels of excellence and performance. In this changing environment, organisational learning and workforce training constitutes a critical success factor for these enterprises. E-learning may yet achieve its potential in this regard if managed and used wisely by SMEs with the support of both researchers and practitioners.

References


