Interactive Educational Multimedia, number 9 (November 2004), pp. 63-76
http://www.ub.es/multimedia/iem

A comparison of the advantages and disadvantages of IT based education and the implications upon students.

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Abstract

There are a number of changes which have taken place within Higher Education (HE) and Further Education (FE) over the past decade, political, social and economic. Certainly within the UK, increasing numbers of people are being encouraged to apply to study at universities and colleges via a variety of formats, Scottish National Committee (1998). Research also suggests that more students are choosing to study online, Meyer (2003). There are many views that suggest this method of learning is suited to a variety of students. For instance, the increased flexibility it provides in terms of study time and location. There are also opposing views that suggest that online learning is only an option to those in society fortunate to be able to afford it financially, and that even those who are able to partake in IT based education are faced with the threat of isolation caused by reduced levels of interaction in the online environment. The aim of this study is to compare both the advantages and disadvantages that online learning can offer to students. The study will consider how online education is increasing the accessibility of higher education to many previously denied, as well as allowing for any evidence that may provide a link between performance levels of online students compared with their classroom counterparts. Providing an insight to how online graduates may potentially benefit the workforce and society. Opposing views, for example lack of face to face interaction, threats of isolation, and the potential creation of a social divide will also be covered, whilst considering how educational institutions may be able to reduce or even prevent these issues and aid the development of online education

1. *Introduction*

Recent years have seen a dramatic growth in the number of students participating in educational programs on a part-time basis. Factors that have contributed to such growth include, the increasing cost of education, coinciding with the reduced financial aid now available to full-time students. This is coupled with the fact that many students attending universities and colleges today have work and family commitments. In order to maintain market position and respond to student demands many institutions are developing a means of part-time study solely through the use of technology, Raymond (2000). This method of study is often referred to as online learning, e-learning, virtual learning, or in some cases distance learning. Carter (2001) comments that e-learning is moving upwards on the agenda for almost every university and college. Opinions remain divided as to the benefits and long-term potential regarding this particular mode of study. Many (McNaughton, 2001; Raymond, 2000; Evans and Fan, 2002), add that online learning is providing the opportunity of access to HE and FE for many previously denied groups such as the disabled and those restricted by geographical distance and in some cases the social issue and stigma associated with HE participation. Although there are those (Wang and Newlin, 2001; Kruse, 2001a), who feel that online learning restricts the level of interaction between both student / instructor and student / student, posing the threat of isolation.

There are also concerns regarding the reliance upon technology in order to study, Kruse (2001b) recognises the potential drawback imposed upon students that are unable for whatever reasons to gain access to the required technology. However, Dhanarajan (2001) claims that technology can benefit education in many ways. It is also important to consider the key changes that have occurred throughout institutions during the past decade, and the more 'business like' approach they are now taking, Newman (2000). As well as the impact that students in their more customer-focused roles, White (2000), have upon institutions.

2. *Students*

Online education has grown at phenomenal rates during the last 30 years; one of the main reasons for this is the opportunity of post compulsory education being offered to those who have been denied for generations, Dhanarajan (2001). Allied to this is an opportunity to extend, enhance and develop learning and associated additional resources utilising appropriate technology. However, behind each argument supporting IT based education are the underlying questions of whether online learning is equivalent in nature and engagement to conventional teaching and learning, in terms of student performance levels, or does it alienate students, deprive them of essential social interaction, and leave them feeling isolated?

2. 1 Greater Opportunities Offered

"Distance learning affords educational opportunities to individuals unable to attend conventional classroom settings" McNaughton (2001**,** p.1). McNaughton continues by saying that such individuals include the disabled, those living in rural communities where commuting daily to university or college would prove difficult or even impossible, and finally those with various time restrictions that prevent them from attending scheduled classes. Raymond (2000) enhances this point further by saying that

a number of today's students wishing to enter into Higher Education (HE), have work and family responsibilities. The way in which online learning differs from conventional classroom learning, and the different opportunities offered by the online environment are highlighted by Evans and Fan (2002), who suggest that there are three main advantages to online learning:

1) learner-determined location for learning – whereby students are able to choose their own place of study;
2) learner-determined time of learning – students are able to organise their own individual learning schedule, rather than having to study on a specific day at a specific time, and finally;
3) learner-determined pace of study – students are able to set their own individual pace of study without being held up by slower students or vice-versa.

Shaba (2000) proposes that online learning can also improve opportunities for students in relation to performance levels. He claims that many shy, inhibited students are often intimidated by the conventional classroom environment and rarely ask questions or voice their opinions. However, the communication methods of the online environment, for example student chat-rooms and forums can provide these individuals with increased confidence and are often less intimidating. It would seem that online learning offers a greater variety of people whom are in many different situations, the opportunity to proceed in HE, perhaps also offering a chance of performance improvement to a selection of individuals. Brace-Govan and Clulow (2001) conducted a study comparing face-to-face with online learning, from a learners perspective. Students were interviewed by telephone to measure their views about online learning. The students responses proved to be overwhelmingly positive and often enthusiastic about the amount of flexibility offered by online learning, something they considered to be important in view of the other commitments they had, for example, work. Relationships can also be fostered
within the context of an online environment and is a powerful medium particularly for part time work based students who find the erratic attendance patterns and study difficult, O'Donoghue and Singh (2001).

2.2 Risk of Isolation

The arguments against online learning are centred largely around the concerns for the loss of traditional classroom face-to-face interaction, and the potential feelings of isolation this can create. Research carried out by Wang and Newlin (2001), suggests that the majority of online courses still adopt an *Asynchronous* approach to learning, and *Asynchronous* learning limits the amount and depth of interaction amongst both students and instructors. Whereas a *Synchronous* approach to online learning would provide students and instructors with a more interactive environment. These findings are supported by a study carried out by the University of Plymouth (2001), which indicates that online courses often limit interaction activities such as teamwork, which tend to be offered more frequently in the conventional classroom. The study also maintains that it is interaction, which most facilitates the learning process, although also appreciating that replicating this online is a major technological difficulty. This study also implies that it is not just the student / instructor interaction that is reduced by the online environment but from a social perspective students often lack the interaction with their peers which can lead to feelings of isolation. Kruse (2001a) supports the later point

by portraying the view that the reduced social and cultural interaction is a major drawback in online education. Kruse continues by stating that students miss out on certain communication mechanisms that are often taken for granted in the conventional classroom, such as body language and peer-to-peer learning. All of which make online education a very impersonal environment in which to work.

Stelzer & Vogelzangs (2000) develop similar views further by linking feelings of isolation with a direct impact upon student's motivation levels. They maintain that when students are sitting alone in front of a computer they are more prone to distraction, and unless the online course material is interesting, providing sufficient amounts of interaction, the learner will become distracted and may even drop out. Sharing the concerns regarding interaction levels Schwartzman (2001), claims that students who constantly interact via technology can find difficulty in confronting interpersonal interactions, and that the skills needed to negotiate with all kinds of people, and handle personality conflicts in Schwartzman's view are more valuable than the ability to click through a series of menu bars. Important skills that if not developed could perhaps impact upon student's careers later in life.

Evidence gathered appears to suggest that IT based education and online learning are offering the opportunity of education to a far wider scope of people than in previous years, for example those restricted by geographical distance, those with work and family commitments, and the disabled. However, student isolation and alienation have been linked with course design, indicating that perhaps with further research and development such issues may be reduced or avoided, by varying the amounts of synchronous and asynchronous communication and maintaining reasonable levels of student / instructor and student / student interaction within the program. There is still insufficient evidence to ascertain whether students perform better in an online environment in comparison with the conventional classroom, however, findings do seem to imply that shy students may gain more confidence and perform better in an online environment rather than being intimidated in the conventional classroom.

3. Technological implications

Having previously considered the increased opportunities that online learning can offer to students, such opportunities are based on the assumption students have, or can easily gain access to the technology requirements, and that all students are competent with the software provided.

3.1 Accessibility and Additional Skill Requirements

With all methods of online learning there is a necessity for students to have frequent access to a computer, a modem, and a telephone line or cable connection, Uhlig (2002). Kruse (2001a) sees this as a potential drawback as such technological requirements are not available to everyone, although the price of the technology is constantly being reduced it still proves to be too expensive for some, particularly when incorporating the online communication costs. A subject raised at the International Conference on Learning and Teaching Online by Dhanarajan (2001) who acknowledged the personal cost of technology can reach unaffordable levels amongst low-income users. Consequently, as well as being an asset to education, technology, or lack of it, can prove to be a barrier for many. Dhanarajan continued by saying in order for online education

to sustain its success, access to the required technology should not be limited to only a few who are able to afford the associated costs and already have the required skills and knowledge. Technology should be made available to the many who lack those assets but need education and training in order to experience further and higher education.

Uhlig (2002) continues by adding that it is not just the physical aspects of technology that are required but certain skills are also essential for example, keyboarding skills as well as the ability to communicate proficiently through reading and writing, as the majority of communication that takes place in an online environment is written. Studies carried out by Brace-Govan and Clulow (2001) present similar findings furthering this view by suggesting that students sometimes experienced difficulties in learning the software for online courses, sometimes creating a feeling of cognitive overload. Brace-Govan and Clulow continue by maintaining that in order to be successful students need to be competent with the learning software before deadlines and coursework take over. Taynton (2000) also notes that many online students face the added burden of having to familiarise themselves with the requisite computer technology prior to learning the course curriculum.

The reliability of technology also raises some concern. Studies carried out by MacGregor (2001), concluded that many online students displayed concerns with regard to the technical problems that they had experienced, and as a result had affected their work. For example, not being able to complete assignments because of web or technical malfunction. A point that was also raised by a sample of students in a study conducted by Alexander (2001), where students rated adequate access and availability to technical support essential to achieving success in online learning.

3.2 Multi-media and Audio Visual Support

Following some of the negative concerns that technology raises, Dhanarajan (2001), does recognise the benefits that technology has brought to education, for example the support offered to students by the information available on the Worldwide Web (WWW). Volery and Lord (2000) observed from their findings that the richness of technology used in online course delivery often influenced the effectiveness and level of impact it had upon students. Online courses that combined both synchronous and asynchronous communication methods, supported by a variety of text, graphics, audio and visual messages often increased the levels of interactivity and overall performance levels of students. Similar findings were presented by Evans and Fan (2002) who claim that virtual learning which makes greater use of text, sound and video, help to enrich the learning process. They also explain that the use of multi-media allows demonstrations of physical and abstract phenomena to take place through computer modelling, which can be very difficult to replicate through the use of text and video alone, as in the more conventional classroom.

Kruse (2001a) again recognises the importance of multi-media in online courses, Kruse sees the use of audio and video critical to creating realistic simulations and accommodating different learning styles. However, he displays concerns over the lack of multi media used in many of today's online programs and sees this as a major drawback in online education. Raymond (2000) suggests the reason for this is the time and labour requirements of designing an online course with sufficient multi-media content.

Conclusions drawn from previous findings suggest that online learning is offering education to many groups of people previously denied, however, this conclusion was based upon the assumption that such individuals had sufficient wealth to afford and support the technological requirements. It appears that online education may still be limiting access to the socially and financially disadvantaged. Even those fortunate enough to have access to technology still appear to experience problems utilising the equipment and learning the software. Although, as highlighted by both Volery and Lord (2000), and Evans and Fan (2002), from a positive view technology can enhance the learning process and help explain complex phenomena to students through the use of various multi-media.

4. Universities / Colleges

Increasing numbers of students entering into HE, together with the scarce resources available throughout the 1990's, brought about the re-introduction of tuition fees to all full-time undergraduate courses. This was then followed by the government's decision to turn traditional student maintenance grants into loans, which in turn put an end to student's entitlement of state funding. These fundamental changes have increased financial hardship considerably amongst full-time students, and consequentially institutions are now beginning to see increasing numbers of part-time students, Watts and Pickering (2000). According to Armstrong (2000) such financial strains are also apparent in the huge demand and rapidly growing market for online learning, particularly amongst adult learners. Although Armstrong maintains that this is a market still largely ignored by colleges and universities throughout the UK. These events raise the question of whether or not institutions are able to respond to the latest demands of students, both financially and in terms of quality course content and sufficient support from faculty.

4.1 Key Changes

Even with the increasing demands for online courses the majority of universities and colleges in the UK are still slow at launching such programmes of study, due to the extent of the initial outlay, Arsham (2002). As an alternative many traditional non-profit institutions are now forming partnerships with for-profit organisations, in order to meet with changes in consumer demands and increase market share, Russo (2001). According to Armstrong (2000) this is because IT based education development and growth is largely driven by the for-profit sector, which hold greater financial resources allowing them to develop faster and consequentially meet with consumer demands a lot sooner than traditional institutions. Schwartzman (2001) sees the competition from for-profit organisations as a potential benefit for students, maintaining that competition can and very often does improve quality. However, Schwartzman also states that the wealthier institutions (i.e. Oxford, Cambridge) are able to infuse technologies much earlier and much deeper into their curriculums than smaller less established institutions.

The approach of traditional institutions has been forced to change considerably; trends now show a new way of 'business-like' thinking, with far greater emphasis being placed upon revenue maximisation. Whereas in the past universities and colleges have focused more on the needs of society rather than self-gain, Newman (2000). White (2000) expands upon this point by adding that as a result of this, the concept of the learner

being seen as a customer is increasingly prevalent, this is then linked with the demand for part-time and online courses, as well as the introduction of tuition fees, which is also leading to a more customer-style attitude being portrayed by the full-time undergraduate students. As previously mentioned in order to compete and satisfy the latest student demands, many traditional institutions have formed partnerships with for-profit organisations, however, others are taking a slightly different approach. Many institutions already partaking in online delivery methods are choosing to completely outsource the development of their online courses in order to provide students with round the clock 24/7 support, Reisman, Dear and Edge (2001).

4.2 Significance of Instructors and Course Content

A critical factor underpinning either the success or failure of any online course is the preparation and enthusiasm devoted by the online instructor or facilitator, Raymond (2000). Whereas some, Russo (2001), claim that it is weak course content that is the most significant obstacle in the way of e-learning development. Alexander's (2001) explanation links both of these claims by stating that it is various problems surrounding faculty that have hindered the development of many online courses, studies highlighted the following issues and the greatest obstacles:

1) Lack of time available – 78% of lecturers claimed that developing an online course involved more time and effort than initially anticipated.
2) Lecturing staff were provided with insufficient access to advice and technical expertise.
3) Lecturing staff did not value the different skills required to place a course online as opposed to conducting it in the classroom.

Alexander added that if HE institutions are to meet the challenge of e-learning, they would need to improve their current focus on teaching strategies considerably.

Institutions need to modify their teaching and learning strategies in order for online courses to become more relevant for students. For instance Raymond (2000) suggests that the role of the traditional classroom lecturer has to change in the online world to that of an 'information navigator'. Armstrong (2000) agrees by adding that online courses must be approached differently than traditional lecture courses, suggesting that traditional faculty roles need to be 'unbundled'. Armstrong continues by stating that a successful campus lecturer who can hold the attention of hundreds may not be as great when faced with technology.

Research conducted by MacGregor (2001) highlighted that students themselves emphasised the importance of a good instructor, if any online course is to be successful. Student's comments were often centred on the quality of instruction, knowledge levels, preparedness, availability, and support. The later point is something reinforced by the work of Volery and Lord (2000), who also emphasised that students partaking in online courses would often face technical problems, and there they considered it critical for the instructor to have a reasonable knowledge of technology and able to perform basic troubleshooting tasks.

Findings suggest that many institutions are taking note of students increasing demands for online courses, however, progress remains slow. Some institutions are choosing to

form partnerships with for-profit organisations, whilst others are choosing to outsource technical requirements in order to accelerate the process. However, in order to satisfy student / consumer demands fully by providing quality online courses, it appears that institutions need to consider carefully the role of faculty, and how such roles will need to change if they are to become successful in the delivery of online courses. This is summarised by Gilroy et al. (2001) who see student satisfaction as the pinnacle for continued success of online learning.

5. Society

There are many views suggesting that online learning has offered educational opportunities to many members of society who were previously denied for various reasons. Enabling study from home, work, any place where access can be gained to a PC, Morgan Cooper and Toolet (2002). By increasing the number of people whom are able enter into HE, theoretically the number of graduates should also increase, benefiting other areas of society for example employers and business organisations. In spite of this, concerns have also been shown with regard to the costs of technology possibly depriving the poor and less well off of the opportunity of HE particularly online. Raising the question of whether online education is creating a greater social divide, O'Donoghue (2001).

5.1 More Qualified Workforce

In today's society companies compete fiercely for highly skilled employees, in a survey carried out 70% of large companies viewed the lack of trained employees as a major barrier to growth, Clarke and Hermens (2001). As previously established online education is providing the opportunity of both higher and further education to larger numbers of people, which theoretically should provide society with higher numbers of graduates than experienced before. Online learning, however, also offers a form of life-long learning to those potential students already committed to full-time employment, helping to develop the existing workforce. Clarke & Hermens continue by adding that online learning offers employers the chance to improve the qualifications of current employees without having to incorporate travel expenses and time spent absent from the workplace. This is a view supported by the work of the University of Plymouth (2001), which recognises that modern society is now placing greater emphasis on the concept of life-long learning, and by being able to gain access to online education from within the workplace.

Vinten (2000) sees this as beneficial to full-time employed students and potential students, as employers are increasingly demanding post-graduate qualifications from their employees, but rarely allow time off to study. Further research conducted by Vinten suggests that those graduates who have studied by means of online education have more to offer employers, in terms of additional transferable skills that equip them more suitably for the workplace. Vinten continues that computers are good for developing an individual's problem solving skills as well as developing their knowledge of technology alongside their subject knowledge. In addition to this graduates who follow an online method of learning tend to be more self-motivated and self-disciplined, as a result of having to manage their time more efficiently in order to complete study timetables as well as balancing their work and family commitments, Brace-Govan and Clulow (2001).

There are a number of views which oppose these arguments. For example Arsham (2002) claims that many employers are still sceptical with regard to employing online graduates, as the concept is still very new, and they themselves will have probably studied traditional campus-based degrees. Newman (2000) also fails to see how an online environment can provide students with the required social skills needed to enter their chosen profession. An example used by Newman is that of a law student who engages in a virtual law school, Newman refuses to see how they can gain the experience of various legal traditions, unless they interact with members of that profession on a regular basis. Newman diversifies slightly by suggesting that there are still a great many students who are not socially educated within the work force, but adds that this is not only linked with the methods of education, but rather that a significant number of students can still not gain access to the required levels of education.

5.2 Risk of Creating A Social Divide

By increasing the flexibility of access to HE, and with online learning as an alternative delivery method, the opportunity of HE is being made available to more and more people from various backgrounds. In addition to this there are the arguments with regard to accessibility of technology, or lack of it concerning the financially less well off members of society. Much of the following work appears to form a link between the lack of accessibility and the creation of a new social divide. Greater education opportunities can potentially increase an individuals social mobility, however, in today's society the innovations of technology in relation to education are further stratifying society due to the financial costs of the technological requirement, and the fact that the poor or less well-off can simply not afford them, Schwartzman (2001). Dhanarajan (2001) agrees with the view of Schwartzman, continuing that online courses are increasing the gap between the rich and the poor. A gap that he considers will continue to grow if institutions persist with the relentless pursuit for both market position and profit, as the poor will simply be ignored. Concluding that technology may be an asset to education for some but to others is it more of a barrier.

Shaba (2000) reiterates these points stating that opportunities of HE are missed by many individuals purely because of financial hardship, and therefore the increasing reliance upon IT based education has the potential to further increase the divisions within society. Referring back to the work of Newman (2000) which also suggests that IT based education poses the threat of a 'digital-divide' upon society, and if online education carries on to develop those fortunate enough to gain access, it will therefore become even harder for the less advantaged individuals to gain access to the best opportunities, again enforcing a considerable social divide.

From the evidence it would appear fair to suggest that whilst online education is giving out increased educational opportunities to some, it is also socially controversial, potentially excluded some stratum of society. Those with regular access to technology have the chance to further their education and in turn benefit employers and business organisations, yet those less fortunate who cannot afford access to the required technology are continuing to be disadvantaged.

6. Conclusion

There are many advantages that online learning can offer to students and staff. It has provided those previously denied i.e. the disabled, those living in rural locations, those with work and family commitments the opportunity of Higher Education. The online learning environment has proved to be advantageous to many shy students who were previously intimidated by the traditional classroom, and often too anxious to voice their opinions, online chat-rooms have provided them with the confidence to do this. The research also suggests that being able to study at one's own pace is beneficial to students as they are no longer at risk of being held back by slower students or vice versa. There is evidence that proposes that students can benefit from the frequent use of technology and multi-media, which can help enrich the overall learning process. This may form a link with the appeal of online graduates to employers and the additional skills that they have to offer the workplace.

In contrast to these findings it is still clear that opinions remain divided and that many still feel that online learning excludes some within society, the poor / less well-off, the socially disadvantaged, who are unable to afford the equipment that is essential to this mode of study. An issue that many feel if not resolved will increase the division within society. Concerns are also raised with regard to the skills required to drive the technology, for students who are unfamiliar with technology and the learning software, this may limit their overall performance levels. Although as previously stated there is still very little evidence available to draw any solid conclusions regarding student performance levels within the virtual classroom compared to those in the conventional classroom. The risk of isolation appears to be still an issue throughout many research articles. However, it appears a possible link may be apparent between better quality course design and instruction, for example increased use of multi-media, a balance of both asynchronous and synchronous learning styles, together with sufficient interaction from faculty, may help to curb student feelings of isolation. This provision of a multiple media approach to stimulate a variety of cognitive factors is important, not least for those who are challenged by their limits in literacy.

If online education is to continue to develop and benefit students and staff, it is wrong to discriminate against the less well off, both intellectually and financially. Perhaps for the future both the for-profit organisations or the traditional non-profit institutions may have to consider offering equipment rental as an added option. Until which time only those students available to fund the costs will be able to experience the full advantages that IT based education has to offer.

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