Effective E-Learning Integration with Traditional Learning in a Blended Learning Environment

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Abstract

E-Learning is an emerging tool that uses advanced technology to provide training and development in higher education and within industry. Its rapid growth has been facilitated by the Internet and the massive opportunities in global education. The aim of this study is to consider how effective and efficient e-learning is when integrated with traditional learning in a blended learning environment. The study will provide a comparison between purist E-Learning and Blended learning environment. The paper will also provide directions for the blended learning environment which can be used by all the three main stakeholder student, tutors and institution to make strategic decision about the learning and teaching initiatives. The paper concludes that blended learning approaches offer the most flexible and scalable route to E-Learning.

Keywords: E-Learning, Technology, Education, Student, Institutions, Training.

1. Introduction

There is fierce marketing competition between the universities due to the open access to wide range educational opportunities caused by globalisation. Due to competition students are becoming more critical of the quality of education they are receiving. Students enrolled on E-Learning courses want to make sure that they are receiving the best training from highly qualified instructors, most of whom they will never meet face-to-face. Hence, in the absence of physical and visual cues, students in a virtual learning environment have to heavily rely on other psychological and sociological stimuli (e.g diplomas, instructors, industry, background, instructors, research, publication, school accreditation, certification, etc.) to validate their perception of quality and efficacy (Malala, 2004). This leads to the question of how effective and efficient E-Learning is and whether students would be sufficiently equipped to go out in the employment world after completing their education just through an E-Learning mode. Students have very high expectations from the education and are very much concerned about the quality of training and education they receive. They want to learn, gain knowledge, improve skills and want it to be value for their money. Does E-Learning provide all these and if not then do we have another solution which may provide all these and fulfil students' expectations?

It is very vital to determine the factors that affect students' perception of quality of education while using E-Learning. The two stake- holders, academic institutions and tutors must address these issues to satisfy students before deploying any virtual learning environment. No matter how good the E-Learning environment is and what best technology is used to create it, if students are not satisfied then it is of little use. .

The main focus of this research will be to determine how effective and efficient E-Learning is when deployed on its own and when integrated within a blended learning environment and identify the differences of learning achievement between two groups of people who are exposed to E-Learning and blended learning environment. This work will attempt to test the following hypotheses

"Students' performance will improve in the courses taken in blended learning mode."

"E-Learning will be more effective when integrated with a traditional learning in a blended learning environment."

1.1 The Current Role and State of E-Learning

The World Wide Web has fascinated the academic institutions around the world and provided a potential for a new medium to deliver courses to people, who live faraway from the institution, in the form of the text, audio and video without the need of adding new buildings or hiring new instructors (Malalla 2004). The majority of the academic institutions accepted E-Learning as an alternative to the traditional classroom teaching without any stiff resistance. The acceptance rate was very fast, rapid and widespread (Malalla 2004).

The teachers and professors who had a growing interest in the technology and Computers showed great interest in online teaching and learning. They showed determination to invest time and resources to discover the complexities of E-Learning to make it a universally accepted theory. In every university almost every teacher is making effective use of technology and transforming some or all of the existing course material into the E-Learning environment. There is a growing number of online courses around the world. Not just the universities but many private companies are making use of E-Learning to provide training courses. Malalla (2004) argues that with the increase in course offerings, there is an increase in research interest and other scholarly pursuits from both the corporate perspective and the academic standpoint. Almost every field of interest is making use of E-Learning in one way or another. According to Sonwalkar (2002), "*Most universities and corporate trainings facilities now offer some or all of their courses online*". Universities around the world offer all sorts of courses in E-Learning these days from IT, Business, Medicine and Sports.

The literature related to this topic demonstrates that all the academic institutions as well as industry is implementing E-Learning in every field at a very fast pace. Today there is hardly any university in UK that does not offer some kind of online learning and teaching in the form of E-Learning. There are some universities which are offering postgraduate degrees to students from all over the world via E-Learning. Some of the universities have a complete department dedicated to E-Learning research and development.

2 Background of E-Learning

Human computer interfaces are of course an integral issue in designing E-Learning packages. Much research has explored the design of advanced interactive systems to provide for a high quality user experience. For E-Learning it is important to develop advanced interactive spaces that enable the users to evolve their own conceptualisations of the learning material and follow individualised pathways through interactive constructivist-constructionist learning with maximum learning autonomy unhampered by hard-wired learning styles and pathways. The advances in electronic communications, the Web and the Internet and associated technologies have motivated the widespread adoption of E-Learning to improve access for learners to higher education and employee training in the workplace (Hameed, et al, 2007).

Computers are now commonly used for storing and manipulating data to assess the student's performance. The same software and hardware can be used as a vehicle for teaching most of the computer-aided based courses. The educational material in an E-Learning system has to be very carefully structured so that the student can follow a logical path through the lesson. E-Learning systems have evolved into complex systems; so that it can often be difficult for a teacher/ developer to know the best regime to follow when starting to develop an E-Learning system (Hameed, et al, 2007).

The beginning of electronic communications, the Web and the Internet and associated technologies have produced a change in which E-Learning is seen as a means towards improving access for learners to higher education and improving employee training in the workplace.

There are two interpretations of E-Learning implicit within the work in this paper. One definition is that of E-Learning designated as predominantly or almost entirely enabled by online access to virtual learning experiences but without multi-modal, multi-media and/or social network support. This designation is used for the purpose of comparing and contrasting such a purist E-Learning approach with the more advanced and modern characterisation of E-Learning which is distinguished in this thesis as blended learning with social network support such as may be facilitated by Web 2.0 technology-enabled spaces e.g. IM, U-Tube, web logs, wikis etc.

E-Learning is revolutionary and it is a time for a new and fresh approach. The main advantage of E-Learning is that it focuses on the individual learner. The new approach of thinking of the learner as a customer has changed the whole process of learning. In the past training and learning was organised for the convenience and need of only two stake holders mainly instructors, institutions and ignoring the third and in some respect the most important one, a learner or student (Cross, 2003).

2.1 Advantages and Benefits of E-Learning

The main benefits of E-Learning are its flexibility and accessibility, both in terms of time and place and in terms of its accessibility to a much wider population. A student is now able to learn wherever there is a computer and at whatever time of the day is convenient to them. E-Learners are able to access the E-Learning materials from home, work or wherever they choose, and at the time of day that they choose. They can also control the pace at which they progress through the materials. Students can create learning spaces in their own homes. Klein and Ware (2003) found that this was preferential to any "official" space allocated to the E-learner by the employing organisation.

Students are able to obtain globally recognised qualifications from established UK universities and still continue to live and work in their home country. E-Learning allows students to choose a course, which is recognised as the best in their field, no matter which university it originates from. E-Learning breaks geographical boundaries and erases worries that mature students may once have encountered such as moving home, or finding new schools for children and they can continue to work, if they choose to study part time (Walmsley 2003).

From a corporate point of view E-Learning is accessible and cost effective. Rockwell Collins in 2002 had to train its 2,500 employees on a critical course and traditional learning would have allowed an education rate of only 200 employees per year. E-Learning however allowed the company to train 800 of its employees in the first two months of training (Jones 2002). It also allows employees to learn in real time, employees can access the information at any time, rather than scheduling a training course. There is also the advantage that the employee can refer back to any part of the material that they do not feel fully familiar with. Figures suggest that E-Learning can provide 30% more training content in 40% less time and at 33% of the cost of more traditional techniques (Beckett 2004).

A further advantage for corporations is that they are able to work with something that they can manipulate and control to a much greater extent than conventional residential courses. As a result they can create training courses, which serve their particular business needs.

As the potential student base is global, the cultural diversity of students brought together by E-Learning promotes interactions, which would otherwise be unlikely.

E-learners have shown E-Learning to be effective and to improve learning outcome and speed. This is explained by the fact that the average E-student will be mature in employment that this will lead to more employees learning on-line while at work, the importance of this is that there is a growing realisation by students, employers and universities that, by combining work and study, learning takes place at a deeper level of understanding and students are able to apply their knowledge more effectively (Donoghue, et al 2002).

In a traditional lecture setting, 33 minutes after a lecture is completed, attendees only retain 58% of the material presented. By the second day, only 33% is retained, and three weeks after the course is completed, only 15% is remembered (Jones 2002). While in E-Learning lecture setting material can be accessed several times and at any time if something is forgotten which allows students to remember most of the information delivered that they are required to learn in particular course.

2.2 Disadvantages of E-Learning

The most notable disadvantage of E-Learning is its lack of social interaction. Many students need social interaction in order to perform academically well and thus find distance learning difficult. A student studying a subject in isolation will require a great deal of motivation, time management and a focused approach. A traditional bricks and mortar environment provides the chance for a relationship to develop between students and tutorials facilitating the exchange of ideas (Hasebrook, et al 2003).

Bourner and Flowers (1997) suggest a solution to this is to create more of a "human touch" and Daniels (1996) suggests that the solution is that the academic community move the emphasis away from the campus as a common focal point. Instead he suggests, universities should develop a sense of "institutional belonging" amongst staff and students. It is difficult so see how this approach would work, with students never actually meeting their tutor or fellow students.

It should also be noted here that the online student must have proficient computer and Internet skills, sufficient for them to register, communicate, download, view and be tested (Dellanna, et al 2000). This must be taken into account when deciding what type of course content to offer and what skills the student needs to register for the class. This places an obstacle to those who do not have these skills, often these people are fearful of new technology, and predominately are mature students. From this view point it is difficult to see how E-Learning will support integration into the learning system (Hameed, e al 2007).

There are types of training that simply cannot be taught via E-Learning, these are known as "soft skills". These include interpersonal skills, verbal, communication, leadership and initiative. There are fears that online education courses, while offering many advantages over traditional brick-and-mortar courses, do fall short in teaching those soft skills (Walmsley 2003). These soft skills are often essential life skills that contribute towards employability; this problem raises the classic dilemma of the student who is academically excellent, but unable to assimilate his knowledge to others because of his poor communication skills.

It is argued that successful education involves building relationships from the interaction between the student and his or her instructor and among the students. Carole Fungaroli, Professor of Literature at Georgetown University, makes this point:

"Teaching isn't just about disseminating. A lot of what I do involves assessing how much you understand or my students understand, questioning them. We do a lot of discussions" (Kling 2003).

E-Learning does not afford the student with the same opportunities of explanation and clarification that occur in face-to-face interaction and as Blass and Davis (2003) point out, feedback in an E-Learning environment may be delayed or text-mediated or simply too context-dependent to be able to be recreated through a telephone call or e-mail two days later. They further point out that electronically mediated communication typically loses the nuances of speech and dialogue present in face-to-face conversation. It is very often easier to explain something to someone who is sitting in front of you then it is to explain the same thing to them in writing, especially when it can be considered that a great deal of human communication is non-verbal.

Another disadvantage of E-Learning is that it can be difficult to engage some students in meaningful and productive work in an E-Learning environment (Jones, et al 2000) and some authors even advocate that virtual learning environments make no contribution to learning. Others consider that the medium is impersonal (McConnell, et al 2002).

E-Learning tends only to be suitable for learners with strong independent learning and motivation skills, these kinds of people constitute a sub-set of the learner population. This requirement, to a degree, undermines the accessibility advantages of E-Learning. Further E-Learning is very good

for tactical-type learning, but is perhaps not the best medium for teaching curricula, which are deep and broad (Beckett 2004).

3 Blended Learning

Due to the disadvantages of E-Learning a new approach "blended learning" has been developed. The basic concept of this is classroom based tuition will be combined with private study using interactive multimedia resources. There is evidence to show that this approach to teaching works. A blended curriculum, according to a two-year cross industry study by Thomson Learning, is far more effective at driving employee productivity than classroom training alone (Walmsley 2003).

Blended learning has gone through an evolution process of many years and different institution has given a different description of it. According to Mayadas and Picciano (2007) the main purpose of blended learning for higher education establishments is to achieve a great sense of localness. Mayadas and Picciano (2007) define blended learning as a combination of face-to-face and online learning. In simple terms it is the combination of instructor led traditional learning and computer aided learning (E-Learning) environments.

Blended learning comes in many shapes and types. As described by Picciano (2006) blended learning may be used to enhance the traditional lecture with additional readings, electronic instructor notes and images of charts, graphs, or other handouts in one course. In another course, online learning may be combined with face-to-face instruction so that rather than meeting in a classroom three hours a week, a course meets two hours per week with the third hour consisting of an online threaded discussion.

There are two core elements of blended learning (online and face-to-face instruction) and both are very critical in defining blended learning (Picciano 2006).

According to E-Learning India (2007) blended learning model comprise of the following elements which are mixed in varied proportions to meet different organisation's requirements.

- Learning through information
- Learning through interaction
- Learning through collaboration
- Learning through classroom

This means that blended learning involves the appropriate blend of different components which includes courses, contents, feedback, and many other things. This means that the blended learning can solve the ubiquitous problems associated with most E-Learning models such as speed, scale and impact (E-Learning India 2007).

According to Picciano (2006) blended learning in the broadest sense can be defined or conceptualized as a wide variety of technology/media integrated with conventional, face-to-face classroom activities. But to be specific blended learning is a blend of fully online and face-to-face instruction. Figures 1 and 2 illustrate this concept.

Blended Learning Conceptualisation

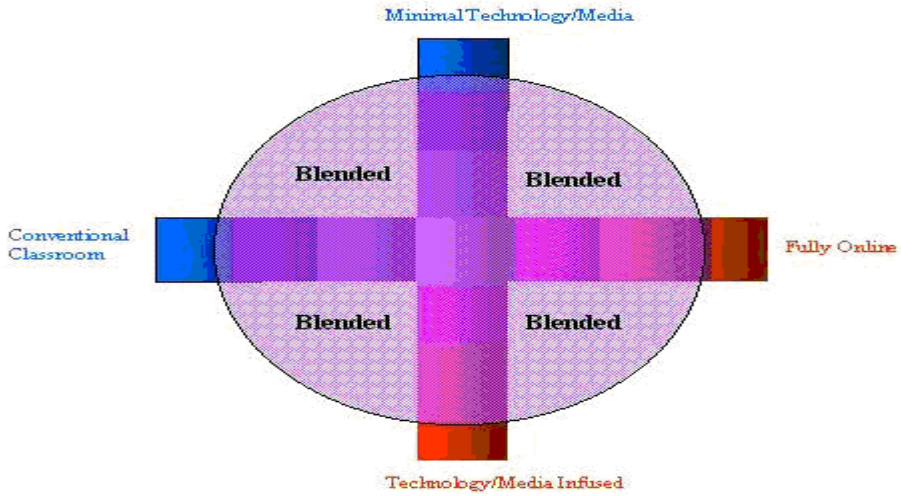


Figure 1 Broad Conceptualization of Blended Learning
Source: Picciano (February, 2005). Also appeared in Picciano (July, 2006)

Blended Learning Conceptualisation

Figure 2 Online-Specific Conceptualization of Blended Learning
Source: Picciano (February, 2005). Also appeared in Picciano (July, 2006)

An example of the benefits of this approach can be seen in a case study of Express Personnel (2004). They found that managers could benefit from online material about the principles of hiring, but needed classroom instruction with role-playing to learn those skills. When personnel go to one of the company's training centres, they learn a lot from other people doing the same job at a different location. These kinds of skills cannot be packaged in an online course. According to Mullich (2004) Studies conducted by Harvard Business School have shown that a "blended learning" approach enables employees and students to learn five times as much material at one-third the cost of a classroom-only approach. Surveys indicate that students and employees overwhelmingly liked the blended approach better (Mullich 2004).

Without the "blended learning" approach, E-Learning courses can be harder to teach and opponents argue that they demand a greater time commitment on behalf of the teacher:-

> *"In terms of organising and planning, everything has to be explicit. Materials must be prepared in advance and made available."* (Kling 2003)

There can be difficulties with intellectual property rights. Arthur Miller, a Harvard Law Professor, was hired by Concord University as a consultant. Concord used videotaped lectures that Miller had filmed at Harvard. Harvard Law School requested that Miller give up his consultancy position. Miller comments,

"They are worried about the Harvard Trademark, and they seem to be saying I am reducing it by allowing some of my materials to be used at Concord Law School"

Online education is still facing problems with branding and accreditation. Although there has been a growth in online degrees and they are more acceptable, there is still a general perception that they are second-rate degrees (Kling, 2003).

According to Klein (2003) there are of course a number of technical limitations to course delivery, most notably the requirement for broadband access to the Internet and a personal computer with a relatively high specification. Another limitation is the development of E-Learning courses as viable commercial products. Courses are often expensive to develop, especially ones that utilise some form of interactive case-based learning, yet are targeted at specialised audiences (Klein, et al 2003).

One of the most important technical limitations on E-Learning is the shortage of competent web authors. Unlike an ordinary author, a web author has to have the skills not only to write a successful web-based training course but he must be familiar with the new learning technologies and develop skills to make his course lively and engaging, clearly it is not easy to find authors who have this combination of skill and talent (Klein, et al 2003).

There are both companies and individuals who strongly oppose E-Learning. Individual resistance can be fairly common in the older generation, often the main target of E-Learning initiatives. It is thought that is partly because E-Learning is so similar to the normal working environment and it does not provide the necessary level of stimulation for learning to take place. Many people are wedded into the idea that you must go away and attend a training course.

"We have found that IT people have bought into the idea of E-Learning providing the fundamentals, but when more complex issues about the application of learning are concerned, we realise that an external tutor is needed to provide the necessary interaction and the benefit of others' experiences."(Beckett 2004)

One cannot hope to technologically reproduce every aspect of the proactive, pedagogical engagement of a good teacher. Indeed, since such teaching relies in some part on a complex human relationship between the teacher and the student, one is ill-placed to attempt to emulate it; but such a privileged relationship is of course to be facilitated as best as possible with the aid of technology-enhanced multi-modal engagement of both sides as it occurs in blended learning approaches to pedagogic management in which an appropriate eclectic mix of teaching interactions, spaces, content, media and tools can be deployed to achieve the learning objectives. Thus in blended learning, technology is seen as being possibly useful in supporting face-to-face teaching, enabling students to interact with learning material in their own time and place, i.e. asynchronous to the constructivist tutor-assisted teaching sessions.

The use of Pedagogical Content Knowledge *(*PCK) to mediate blended learning fits well within the existing e-learning content interoperability framework as PCK deployment is based on open content. SCORM (Sharable Content Object Reference Model). IMS Global Learning Consortium (2003) describes a specific way to deliver e-learning content such that it is re-useable, shareable, durable and accessible (Badii & Mothersol 2007).

There is evidence which indicates that in certain circumstances E-Learning may enable students to work at their own pace and personalise the direction of their learning. Potentially, the Internet is a resource which enables students to communicate and access data in different media forms. Optimistically, web-based technology may provide a learning infrastructure, with features considered vital within the constructivist theory of learning: namely, students belonging to a "community of learners", co-constructing knowledge using societal artefacts and tools (e.g. see Figure 3).

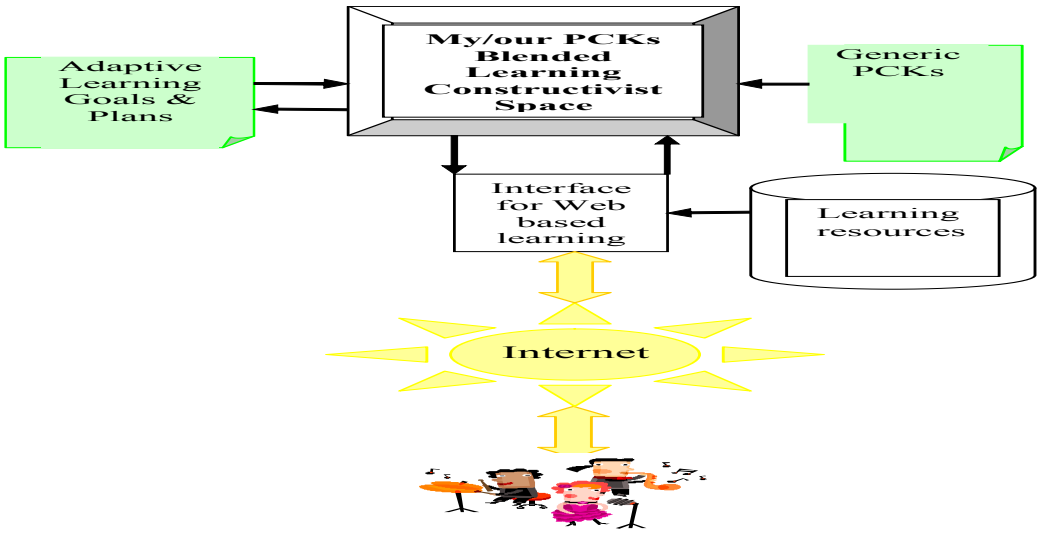


Figure 3 PCK-mediated managed blended learning framework for group or solo learners.

4 Research Methodology

The experiment was done with the group of 200 postgraduate students, who were studying for system analysis module at the University of Wales. The course was divided into to two parts where half of the course was delivered online and other half on in the class with face to face teaching with online support. A multi method approach of combining the close ended and open ended questions was used to carry out the experiment. The questionnaire was delivered in the class and was also available online. Five point Likert-type scale was used for closed ended questions to measure the degree of learning where 1 was strongly disagree to 5 strongly agree. The open ended part of the questionnaire asked questions about the reasons for high or low learning achievements.

4.1 Assessment Framework for Teaching and Learning under different approaches

It is important to be able to assess any improvement or decline in Teaching and Learning efficacy in terms of some measurable outcomes. Thus it is proposed to assess the influences of the various teaching and learning approaches in terms of the following dimensions of comparative and contrastive analysis:

i) Process Improvement in terms of teaching and learning efficacy as measured by appropriate tests and evaluations
ii) Quality of Experience of the stakeholders, particularly teachers and learners
iii) Level of stakeholder participation in the virtual and physical spaces as a further evidence of i) and ii) above.

5 Results

The purpose of this experiment was to identify the differences of learning achievement between two groups of people who are exposed to E-Learning and blended learning environment. This experiment attempted to test the following hypotheses

"Students' performance will improve in the courses taken in blended learning mode."

"E-Learning will be more effective when integrated with a traditional learning in a blended learning environment."

5.1 Graphical Representation of results

Figure 4 Factors for Improvement in learning

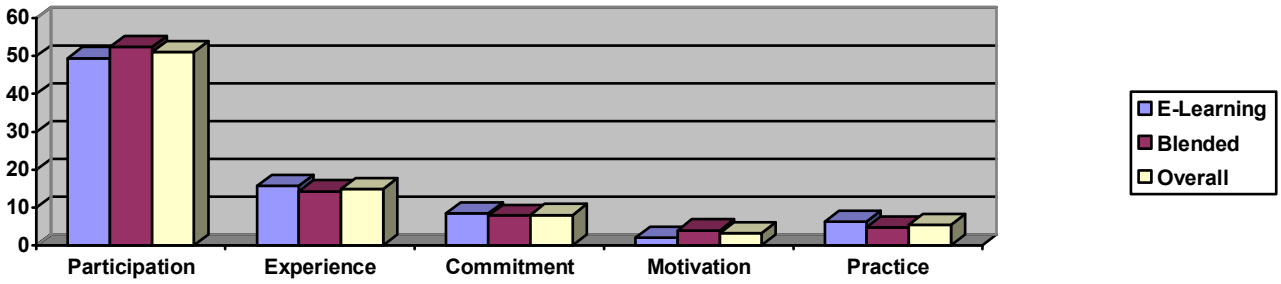


Figure 5 Factors for non improvement in learning

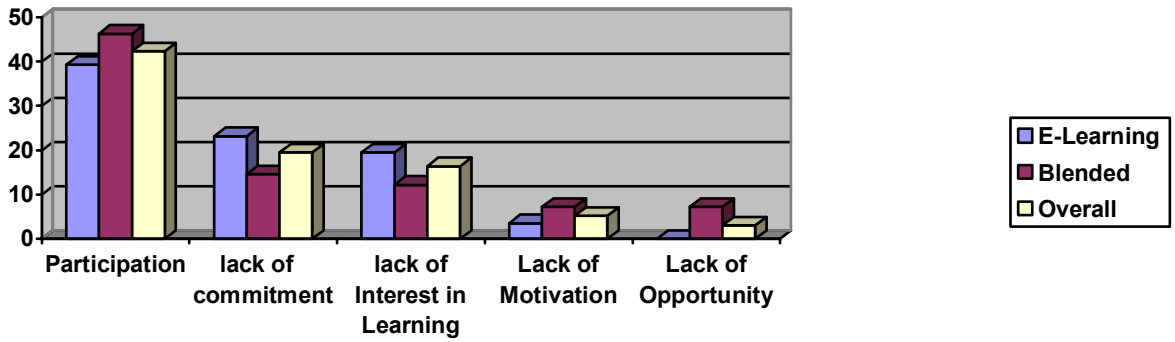


Figure 6 Factors contributing to for high learning achievements

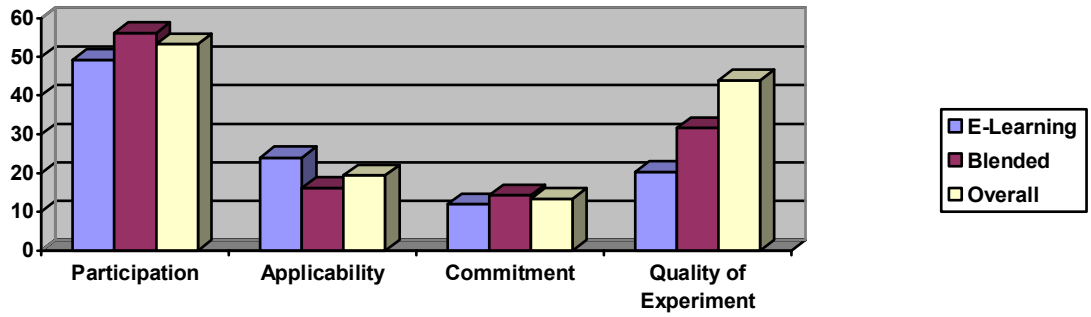
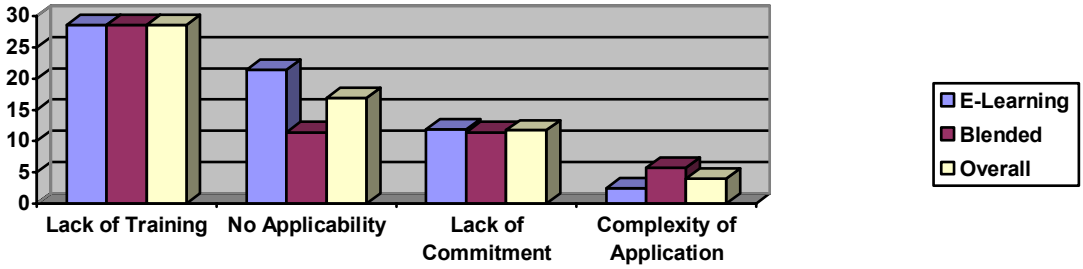


Figure 7 Factors responsible for low learning achievements



The most important factor for learning is considered to be the teaching method design and its effectiveness. Teaching method ineffectiveness can lead to poor performance from the students. Students in blended learning mode expressed an experience of more learning in classroom discussion, assignments and personal interaction with tutors than the students in E-Learning who solely relied on online contents.

It was found from the gathered data and analysis of the data that there were no significant differences between both the groups in E-Learning and Blended learning mode in terms of the learning achievement. From this it can assume that delivery mode may not affect students learning to a significant degree.

The research conducted by Lim et al (2007) revealed that the students in E-Learning mode reported more workload than the students in blended learning mode. This was also the confirmed in this experiment as the students had lot of things to do in a very short period of time with no feedback at the beginning and middle stages of their work which led to a lack of motivation. E-Learning students relies solely on the online material so there was less support for them than the blended learning students who also had the opportunity to meet their tutors face to face (Lim et al 2007). The finding suggests that collaboration is an important factor in both the learning modes to enhance the students' engagement with peers and instructors. This experiment also suggests various recommendations for the two stake holders, academic institution and instructors to provide best learning environment to the third stake holder students. The recommendations also confirm the strategies of Lim et al (2007). The recommendations are

- Instant and Fast Response
- Fast technical support
- Providing students with the progress report on their achievement (Lim et al, 2007)
- Making environment more dynamic and robust

Blended learning mode seems to be better in providing instruction and support to the learners than the E-Learning mode (Lim et al, 2007). E-Learning students face more hardships, challenges and problems than the students in blended learning mode (Lim et al, 2007). One of the reasons for that is due to complete unavailability of the instructor in E-Learning mode to provide fast response or feedback and answer any critical questions. E-Learning students also claimed that there lack of understanding with the technology and contents were a factor led to the low learning than the blended learning students. The results also suggest that blended learning mode is clearer and learner centered than E-Learning mode. Lim (2004) also emphasised on the clarity of instructional resources in E-Learning.

Different teaching and learning methods such as group discussion, group assignments, class assignments, class discussions are considered the most effective learning activities for learners and all these are best practice in a blended learning environment than just in E-Learning. It is clear that blended learning is more important and is here to stay. Blended learning, whether it occurs within a course or a certificate or a degree, offers both the University and students increased flexibility (Lim et al, (2007); Lim (2004); and Hameed et al , (2007)).

6 Assessment of Effects of Different Approaches to Teaching & Learning

As discussed in the Methodology section a framework for assessment of the effects of different approaches to Teaching and Learning was envisaged as involving an improvement, or alternatively a decline, in the teaching and learning process efficacy as corroborated respectively by a either a heightened or a lowered Quality of Experience (QoE) with associated Physical Participation Evidence or Virtual Participation Evidence of the stakeholders as appropriate.

With respect to the above dimensions of analysis of influences of different teaching and learning approaches on the resulting teaching and learning experiences our findings have permitted the following overall assessment:

I) With purist physical or traditional learning approaches such as un-augmented traditional instructor-led teaching and learning the learning efficacy is relatively low consistent with a relatively low Quality of Learner Experience and consequent mixed patterns of physical participation by the stakeholders and of course no virtual participation by them.

II) With purist E-Learning, i.e. with an approach to teaching and learning that relies solely on online access to teaching material, the findings suggest a mixed pattern of process efficacy improvement over that obtainable through traditional approaches as in II above. This is also associated with mixed patterns of Learner satisfaction (QoE) and relatively low take-up of virtual space participation by the stakeholders and of course no physical participation

III) However with Blended Learning which can be viewed as either traditional class-room learning (I) or e-Learning (II) but augmented with multi-modal and multi-media support allowing a fluid responsive interleaving of various teaching and learning approaches and spaces (physical and virtual), the learning process efficacy can be higher thus resulting in a higher Quality of Experiences of both teacher and learner which in turn are associated with higher physical and virtual participation evidence.

If technology-enhanced learning or E-Learning is to be deployed on a mass-accessible scale then the required software platforms for multimedia production, distribution and personalised delivery of learning materials must represent a gracefully integrated accommodation of the various pedagogically relevant models, plus multi-modal and multi-media capabilities that underpin the vision of a socially mediated blended learning experience as depicted in figure 8.

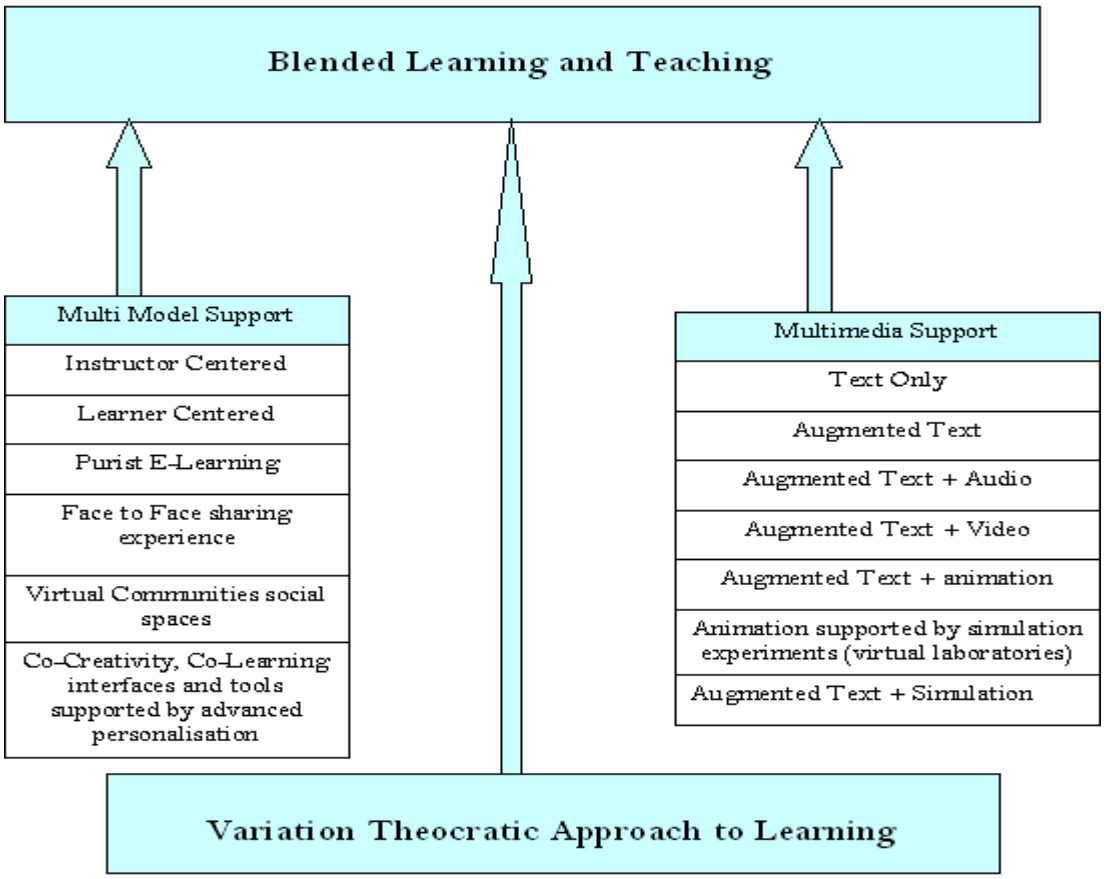


Figure 8 The Supportive Environment for Blended Learning & Teaching

Therefore the required models to be supported are as follows:

1) The educational business models
2) The learners' individual learning preferences and high Quality of Learning and Teaching Experience (QoLTE)
3) The pedagogic models
4) The discipline-specific delivery practice logics
5) Balanced variation-theoretic models and therefore a managed mix of learning modalities and media (e.g. traditional instructor-led as well as online learning) or blended learning
6) Socially mediated, high accessibility, invitationally interactive models of E-Learning and therefore of collaborative learning
7) Evolutionary discursive approaches and therefore creative negotiation-centric models that enable continuous mutual as well as autonomous creativity of teaching and learning strategies by both teachers and students through interactions within social networks of co-learning and knowledge co-creation
8) Models of added-value learning and learner retention in terms of incentive maintenance that provide motivational momentum to keep re-enforcing best learning habits that make for most personal satisfaction through self-actualisation, enhanced self-esteem, efficiency gains and a sense of continuous personal achievement and enhanced autonomy and QoLTE in designing, adopting, adapting and experimenting with own teaching and learning strategies
9) The establishment of discipline-specific augmentive learning assessment environments will provide an additional layer of needed support to motivate blended teaching and learning efficacy, autonomy, personalise-ability and ubiquitous availability and thus take-up
10) The establishment of flexibly deliverable award programmes which allow flexible routes of access to learning materials, learning experiences, paths and modalities of learning all

supported by universally recognised accreditation schemes, will further motivate blended teaching and learning efficacy, autonomy, personalise-ability and ubiquitous availability and thus take-up

An underlying confirmatory observation borne out by the empirical observations has been that for ICT-enhanced learning to be useful, it should sustainably and invitationally support the teachers and learners with enhanced QoLTE in continuing to achieve their teaching and learning goals i.e. acquiring and improving their knowledge faster and faster, gaining experiential insight about the subject matter and correcting teaching and learning errors efficiently and effectively.

Essentially by reference to the evaluation framework set out in the methodology section to be deployed for comparative and contrastive analysis of the efficacy of various (e)-learning modalities, through invoking a relevant set of criteria such as *process improvement*, *quality of experience* and *physical and/or virtual participation evidence,* we can see that Blended Learning as augmented with Social Networking, Co-learning and Knowledge Co-Creation Support shows the highest potential for adding value to the learning experience and learning efficiency gains as confirmed by this and other empirical research.

Table 5.1 Comparative and Contrastive evaluation of the various e-learning modalities

	Observed Learning Process Improvement	**Observed Quality of Learning and Teaching Experience (QoLTE)**	**Observed Physical Participation Evidence**	**Observed Virtual Participation Evidence**
Traditional Instructor-led teaching and learning	Relatively Low	Relatively Low	Mixed	Insignificant
Purist E-Learning	Mixed Evidence	Mixed Evidence	Insignificant	Relatively High
Blended Learning	High	High	Higher	Higher
Blended Learning with Social Networking Co-learning & Knowledge co-creation Support	Highest	Highest	Potentially Higher	Highest

Finally it is important to ensure that the learning is supported by some novel, fun-oriented and certainly invitational, if not provocative, tools and spaces that can intrigue and retain the attention of the learner and sustain a motivated interest to learn both alone and socially as and when appropriate. This is to support learner's self-perpetuating follow-through with learning and thus the establishment of self-fulfilling habits for life-long learning that, at their best, will almost always involve a personalised-balance, to suit individual learning styles, along the various dimensions such as solo versus group, instructor-led versus autonomous learning.

From an infrastructural standpoint there has to be an assumption of readily available and share-able multimedia learning resources and tools for selecting, accessing, enhancing and customising

such resources as bundled learning objects or composites. These must be ubiquitously available to all teachers and learners through dedicated interfaces and spaces for selecting, sharing and choreography authoring of learning objects and their presentation flow management.

The fact that the take-up with collaborative tools such as seminars and discussion boards is not as high as it could be expected as observed in this and other research studies; confirms that there is still some work to be done to characterise e-learning as social blended learning as distinct from the traditional image of it as essentially there to serve solo distance learning - found to be dominant in the mindset of many students few of whom used the chat-and-share facilities for e-learning whilst downloading notes was the dominant form of support that they routinely expected to receive from e-learning environments.

7. Conclusion

This study has documented importance of technology and face to face tutoring in a virtual learning environment augmented within a blended learning environment frame work. But students and tutors will base there final analysis on the effectiveness of both E-Learning and blended learning when given the opportunity on a large scale. This means that the academic institutions must be very clear and realistic about what they are delivering to the students and do not raise student's expectation too high. Recruiting large number of students based on good marketing strategy can be one good starting point for universities but the real success lies in the satisfaction and achievement of students. At the same time universities should provide necessary training to the tutors with all the latest technology and E-learning packages which are essential for teaching and tutors must also show enthusiasm to learn about new technology and use them in the teaching process. Academic institutions should also invest into research in the area of E-Learning and blended learning. It is learning for all the three stake holders and no one should take it for granted. Figure 9 explains the process of learning for all the three stake holders in the process of adopting blended learning environment.

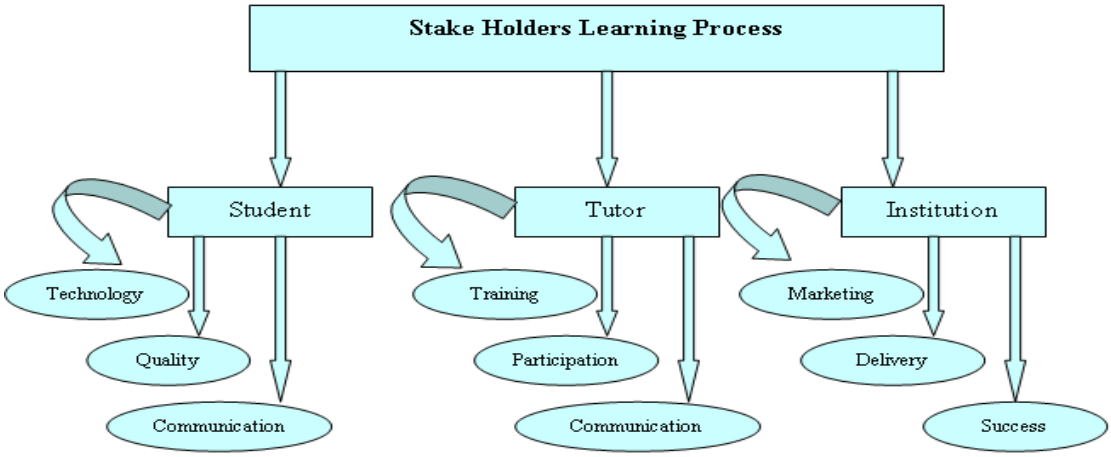


Figure 9 Learning Process for all the three stake holders

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