The Twelfth Cambridge Conference on Open and Distance Learning

What do we know about using new technologies for learning and teaching? A ten year perspective

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The Twelfth Cambridge Conference on Open and Distance Learning
Conference Papers A - D

Towards the successful implementation of Open and Distance Learning in Nigeria

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Abstract

The main objective of open and distance learning (ODL) is to attain mass literacy and to provide opportunities for those who could not gain admission through designated entrance examination agencies as well as those who could not afford to leave their job to attend a full-time educational programme. It is a programme aimed at improving skilled manpower and also improving the skills for those already at work. The purpose of this study, therefore, is to identify both the internal and external implementation problems for ODL in Nigeria under the following factors; schools, managerial, teachers, students, public image, energy-related, economic, Tele-Density and lack of consistency in programmes and policy. Major recommendations are made based on the outcomes of the study. The government should subsidize ODL programmes just like the conventional school system and improve electricity supplies to the nation. Nigeria should emulate ODL implementation procedures of Brazil, Egypt and South Africa. ODL programmes should be seen as the avenue to produce a strong manpower for national development rather than an avenue for Internally Generated Revenue by the stakeholders concerned. Students should develop a good culture of maintenance for the available facilities. ODL can only be sustained with the involvement of all stakeholders.

Introduction

Education is a veritable tool for instituting and managing change. Change in itself is essential for the development of individuals and the nation. In effect a dynamic nation needs a strong educational system. Therefore, providing quality education to millions has been one of the struggles facing developing countries such as Nigeria. However, inadequate access to education may result in many people not participating meaningfully in national development. Hence the need arises for open and distance learning to act as succour for the affected Nigerians, irrespective of tribe or ethnic background. It is also to provide a second chance for those who had once been in the system but had to dropout for one reason or another.

Open and distance learning also favours workers as well as applicants and those who could not secure a position in an educational institution through entrance examinations. Workers gain most benefit because they are exposed to training on the job. Companies and industries need workers who are willing and able to update their skills throughout their lifetimes, hence open and distance learning programmes became a serious avenue for upgrading their knowledge. It is also crucial for preparing workers to compete in the global economy. It is a source for improving people's ability to function as members of their communities.

Therefore, some questions need to be answered:

i. What has been the journey so far with regard to open and distance learning in the Nigerian context?
ii. What is the relevance of the programme to Nigerian education?
iii. What are the implementation problems?
iv. What are the probable solutions to these identified problems?

The Concept of Open and Distance Learning (ODL)

No definition has been found to be exhaustive in attempting to explain the concept of open and distance learning; rather, there are several approaches to defining the term. Creed (2001) defined distance learning as 'an educational process in which a significant proportion of the teaching is conducted by someone far removed in space and /or time from the learners'. Open Learning, in turn, is defined as 'an organized educational activity, based on the use of teaching materials, in which the constraints on study are minimized in terms of access, entry, or time and place, pace, method of study, or any combination of these'. Thus, the concept of open and distance learning suggests an educational approach designed to reach learners in their homes/offices/shops, etc, provide learning resources for them to qualify without attending formal classes in person, or create opportunities for lifelong learning, no matter where or when they want to study.

According to UNESCO (2002), open and distance learning represents approaches that focus on opening access to education and training provision, freeing learners from the constraints of time and place and offering flexible learning opportunities to individuals and groups of learners. Mudasiru (2006) defined distance learning as a term to describe the student–centeredness of distance education and it deals with the use of print and electric technologies to present individual lessons to learners at a distance. Correspondence study entails distance learning through postal sub-groups, that is, learning at home and communicating with the instructor using print materials.

Adebayo (2007a) defined open and distance learning as the type of education that takes place outside the conventional school system; it is imparted without necessarily having personal interaction with students or learners. The practice of ODL in Nigeria takes various forms, which include correspondence study education, distance learning (Sandwich programmes), Part-Time Teacher Training Programme (PTTP), Open University, weekend programmes, adult-literacy education programmes, National Teachers Institute (NTI) and e-learning.

From the above view, one can deduce that distance learning not only shares the goals of the conventional school system, but it also aims to provide access to a historically under-served, place bound, and highly motivated population.

The Evolution of Open and Distance Learning in Nigeria

Distance learning is not a recent concept in Nigeria. Akinpelu (1982) indicated that the Department of Adult Education at the University of Ibadan first mooted the need for distance learning in 1960. The programme was titled 'pilot correspondence programme in the Science subjects' to experiment in the field of science education at pre-university level and thereafter to expand gradually to certain other vital areas necessitating in-service training. This project was renamed 'Correspondence Courses Leading to University Degrees and Diplomas'. This notwithstanding, there had been correspondence colleges in Britain and other places that conducted correspondence courses for interested Nigerians through 'Rapid results' as well as others where courses in business related subjects and administration were obtained.

The National Open University of Nigeria (NOUN) was first launched in 1983 but was suspended in 1985 by the military government. President Olusegun Obasanjo re-launched it in 2001 and NOUN now provides instruction for some 60,000 students as at 2002 (ODL Paris 2002 report), the new United Nations Educational Scientific and Cultural Organisation (UNESCO) chair aims to build up the supply of skilled professionals to manage and design open and distance learning programmes through the use of new Information and Communication Technologies (Daniel, 2005).

NOUN is the first fully-fledged university that operates in an exclusively open and distance-learning (ODL) mode of education. The university focuses mainly on a distance teaching and learning system, and delivers its course materials via print in conjunction with information and communication technology (ICT). The National Open University of Nigeria currently has twenty-three study centres, which are stratified into the six geo-political Zones of the nation.

Relevance of Open and Distance Learning to Nigerian Education

UNESCO (2002) stated 'in efforts to meet the new and changing demands for education and training, open and distance learning may be seen as an approach that is at least complementary and under certain circumstances, an appropriate substitute for the face-to-face methods that still dominates most educational systems'.
The relevance of ODL to Nigerian Education is enumerated below.

Access

It increases people's access to education. People who would have found it impossible to attend the conventional school system benefit from ODL. Many stakeholders in the education sector are interested in open and distance learning because it allows greater access to educational opportunities; this is in keeping with the stated objectives of the National Policy on Education that 'maximum efforts shall be made to enable those who can benefit from higher education to be given access to it. Such access may be through universities or correspondence courses or open universities or part-time, e-learning and work study programmes' (FRN, 2004).

Social Enhancement

Open and distance learning schemes hold a number of potential benefits for various stakeholders in the education and development process. To the learner, ODL means more freedom of access and thereby a wider range of opportunities for learning and qualifications, thereby improving their social status. It is often a cheaper means of attending school for the student since some people may not be able to leave their places of work to go to school full time. Men of the armed forces and other security agencies are registered in large numbers for distance learning to enhance their social status.

Economic Growth

ODL is an avenue for institutions to improve their Internally Generated Revenue (IGR). It is also an avenue for many people to become learned and be better workers in any profession they choose or are currently engaged in. Students are allowed to read up to whatever level they want, hence contributing to the economical growth of the nation through better performance.

For employers, ODL offers the possibility of organizing in-service training for their staff without necessarily releasing them for long periods of productive time. With sufficient number of employees being trained, ODL is often the most cost-effective means. For the government and educational policy makers, the system is a panacea for the perennial problem of provision of equitable and accessible education in an affordable and cost effective way.

ODL has also reduced poverty levels among teachers, since programmes are attended to while at work. The government too incurs little cost on the training but develops the manpower to improve the economic situation of the nation. Nigerian prisoners or inmates enjoy distance-learning programmes in Nigeria so as to be useful to the nation by contributing their quota to the development and economic growth of the nation during and after release. ODL has given tremendous supports to teacher training in the drive to Universal Basic Education programmes in Nigeria. ODL is working towards the development of education and life skills for youth and the management of the available natural resources.

Implementation Problems of ODL in Nigeria

The problems that need to be addressed for the effective implementation of ODL in Nigeria are discussed under internal and external problems.

Internal Problems

The Teacher Factor: Absence of teachers trained in computers to teach the practical aspects of computer skills, coupled with non-availability of computers and allied tools at the centre, militate against actual realization of the goals and objectives of ODL in Nigeria. However, the teacher factor problem calls for an urgent need for all employed and practising teachers to brace themselves for the challenges of communication technology. Also, the successful implementation of any curriculum is dependent on the

informed and rational choice the classroom teacher makes about curriculum programmes and materials required for use in school. Teachers are not adequately remunerated, hence the exorbitant rate for selling their textbooks which does not augur well for the students.

School Factor: The removal of government subsidies for staff and students' welfare has greatly affected Nigerian higher institutions that were at the verge of collapse. Hence, ODL was used as a revenue generating venture and a way of increasing their Internally Generated Revenue (IGR). This observation was supported by UNESCO's (2001) study that the lack of government funding hindered the quality and effective co-ordination of distance education initiatives in Nigeria. The institutions and their location do not always provide hostel accommodation, the conditions of the rooms and environment are always very poor, and water, electricity and cleaners are not available. Moreover, library facilities are not provided for students to update their knowledge.

Managerial Factor: The major task of a manager is to match educational purpose, administrative roles and teaching methodology to achieve the predetermined goals and objectives of the organization. The question is how effective are the managers of ODL in their various institutions? Borisade's (2007) study revealed some ineffectiveness in the area of manager-staff, manager-student, and manager-community relationships. This was due to some extraneous variables such as temporary lecturers, non-availability of accommodation for students during the programme and community outrageous cost in the provision of accommodation for staff and students. The lecturers also face study center managers with the problem of achieving the objectives due to faulty implementation. Most of the lecturers are interested in the monetary benefits, to the detriment of what the students achieved.

The criteria for admission of students were not the same as those of conventional institutions or as stipulated by the Joint Admission Matriculation Board (JAMB) or National Universities Commission (NUC). Primary Six, General Certificate of Education (GCE), National Examination Council (NECO) Grade Two Teachers Certificate, West African Senior Secondary School Certificate (WASSC) holders were admitted for six year programme duration most especially sandwich programmes. Entrance examinations were not conducted for admission into ODL programmes. This casts doubts on the credibility of the students' admission. The time schedule for the programme is inadequate and insufficient for the lecturers and students to adequately complete their course work.

Management admitted an outrageous number of candidates, which increased the staff-student ratio and overstressed the available human and non-human resources. When the regular university lecturers cannot effectively cope with the teaching of all the courses that have to be taught, lecturers have to be locally recruited among the civil servants and secondary school teachers who are assumed to be professionally qualified (Borisade, 2007). This is as a result of the profit-making motive behind the establishment of distance learning programmes by Nigerian institutions and it is gradually taking precedence over academic and professional reasons. Moreover, students' results are usually delayed, lecture and examination timetables are haphazardly prepared and these directly or indirectly affect students psychologically.

The National Universities Commission (NUC) education reform programme (Draft Benchmarks and minimum Academic Standard (MAS) posed problems for the

managers. According to Adebayo (2006b) most lecturers were not aware of the Minimum Academic Standard (MAS) needed by their institutions.

Student Factor: The approval of ODL by the federal government and the NUC gave an opportunity to Nigerians to attain their academic desires, hence the explosion in enrolment of students. The available facilities were not enough for the students, especially during examinations, which gives room for examination malpractices such as cheating, copying, bringing in scripts etc. Also, the increase in enrolment makes teaching and learning difficult for the lecturers and the students.

Most students too lack a maintenance culture. The available facilities are vandalized and misused by them. Study habits of the students are poor; courses are crammed just to pass. Students do not consider it necessary to attend orientation / induction courses at the beginning of their study. Some of the students do not know how to use the library and library facilities. Students are not interested in the acquisition of knowledge and skills; rather they are essentially interested in the acquisition of certificates (Obemeata 2000).

Borisade's (2007) study revealed the concept of 'sorting' which is a recent coinage in Nigeria for a variant of academic corruption; a condition when an academically deficient student 'sorts' herself or himself out with the lecturer or other persons in authority in the institution with a view to securing favours that will wipe out any deficiency. It could be done using money, gift items or sexual gratification.

External Problems

Energy related problems: Power supply all over the country appears erratic. Successful ODL cannot be assured without the use of communication technologies (radio, television, computers). Incessant power failure creates problems for the effective integration of most instructional materials in the delivery of ODL. The poverty level among Nigerians makes alternative sources of electricity, such as generators, unavailable to them.

Low Tele–Density: Access to telecommunication tools such as telephone, the internet and computers among others is still at low ebb. Even with infusion of Global System for Mobile (GSM) communication in 2001 in Nigeria, access is still limited, services are yet to be perfect and the service charge is too high for users.

Lack of Consistency in Programme and Policy Implementation: It is a known fact that access in any educational policy is contingent on the involvement of all stakeholders and sponsorship of the funding agency. The government in power often launches programmes; as soon as the previous government steps out, the current one throws the programme into the dustbin. The political instability of Nigeria since independence has led to poor development plans and implementation of open and distance learning.

Economic Factor: Low level funding of ODL is as a result of inadequate budgetary allocation by the government to that sector. The poor state of the national economy had pauperized most Nigerians. An average middle-income earner cannot afford basic technological tools such as computers, thus a computer set is still a luxury in some institutions, offices and homes. This may make the integration of necessary on-line

resources (internet, e-mail) into open and distance learning in Nigeria difficult. Most of the approaches adopted in the dissemination of instructions in ODL programmes, such as the purchase of books, instructional materials, and provision of facilities such as lecture rooms and laboratory equipment, are capital intensive in a Nigerian setting. UNESCO's (2002) study supported this observation of the cost implications of ODL when it stated that the cost per average student of distance education is more expensive than that of conventional institutions. Nigerian students too considered it as highly exploitative and a way of making money by the institutions and the lecturers.

Poor Postal System: Although improvements have been made in the postal services by NIPOST, the level of services are not yet up to international standards because the services cannot guarantee efficient two-way communication between distant learners and distant education institutions.

Public Image: It seems as if some Nigerians do not value the certificates of those who attended open and distance learning. They believed that ODL students are not subjected to, or rather exposed to, all the practical aspects of some courses. Some believe that their certificates were for sale; that is a rich student could easily find his way out. ODL students are not also exposed to direct university environments such as libraries, laboratories, university cyber cafés, student unions and lecture theatres. Hence some employers and the Teaching Service Commission do not upgrade their staff who have acquired additional qualifications. Some secondary school principals do not recognize graduates from sandwich programmes because they believe they were not well tested (Borisade, 2007).

Conclusion and Recommendations

The aims and objectives of Open and Distance Learning cannot be achieved where the problems of low Tele-Density, electricity, inconsistency in programme and policy implementation, poor economy, absence of trained teachers, poor postal system, bad public image, 'sorting' among students, poor study habits, inadequate facilities, delayed results, high cost and managerial ineffectiveness are prevalent. ODL as a tool for increasing access to education should liaise with conventional institutions including Libraries, NGOs, community leaders, and potential students to move the programme forward. Based on the problems identified, the following recommendations are made.

The Government should subsidize ODL programmes and improve the electricity supply to the nation. Nigeria as a nation could emulate Brazil's A–Plus television series that gives teachers regular access to examples of classroom teaching together with the voices of teachers talking about their experience and concerns. These extension activities aim to assist or help teachers extend teaching practices in ways that include community involvement, participation and development. Other countries worthy of emulation are Egypt's national network distance training which uses inter-active TV technology (ICT medium) and South Africa's re-orientation of teachers for curriculum reform and change, titled 'English in Action', an interactive radio programme by a Non-Governmental Organisation (NGO). Nigerians should adopt this for better education reform up to the tertiary level.

Management should admit students in line with the available resources on the ground. The criteria for the admission of students should be in line with conventional institutions. The idea of ODL programmes being an avenue to generate revenue or

improve IGR should be changed to the production of strong manpower for national development. The use of computers for computing results will reduce the problem of delayed results. Course materials can be delivered through broadcast radio and television, videotape, interactive telephone, satellite, cable or Integrated Service Digital Network (ISDN) Lines. Many would-be distance learners in Nigeria have access to radio, television, and videotape; this makes these media good potential delivery systems for open and distance learning.

With the combination of communication and technology tools, the delivery of distance learning may be effective. This can be ensured through the integrated involvement of all stakeholders and effective planning to ensure successful implementation of distance-learning programmes in Nigeria. No national educational system can rise above its teachers' quality; hence teachers of ODL should be well trained to improve their effectiveness and efficiency in the teaching-learning process. Students should be more focused, adopt a good maintenance culture for the available facilities, develop good study habits and avoid 'sorting'.

Programmes that combine conventional and distance methods are strongly recommended for Nigeria because of its dual role of face-to-face and print learning. This could remove the society idea that the ODL students are undeveloped professionals.

ODL should not be seen as a cost–saving educational measure, which can be implemented without serious planning and good implementation but rather it should be seen as an educational innovation that requires greater attention to planning and guided implementation for the development of manpower.

The enthusiasm shown by government and steps taken so far can only be sustained with the involvement of all stakeholders (Government, business groups, community leaders, teachers, students, conventional institutions, UNESCO, and grassroots citizens).

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Effect of computer aided instruction (CAI) on students' attitude to the teaching and learning of agricultural engineering courses at National Certificate of Education (NCE) level

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Abstract

Computer Aided Instruction (CAI) in the teaching and learning process at the National Certificate of Education (NCE) level is in the process of being fully introduced at the College of Education, Ondo State, Nigeria. Agricultural Science Students' performance in Agricultural Engineering Courses (AEC) at NCE level has not been encouraging. Now the question is: Will the introduction of CAI have a positive effect on the attitude and performance of Agricultural Science Students (ASS) in AEC at NCE level? Eighteen final year students who have received instructions and were examined in AEC were required to respond to a 30 - item questionnaire. The responses were numerically quantified, tabulated and analyzed using the Likert Scale. The analysis showed that the students showed a stronger positive attitude for interest in CAI than for AEC.

Introduction

Background to the Study

The relevance of tools and their usage in Agricultural Science is indispensable for any nation to develop. This is because of the unique role played by food and its production. The process of food production involves branches of science such as Animal Science, Fishery, Economics, Extension, Engineering, and so on, this makes the teaching and learning of Agricultural Science challenging.

The Agricultural Science curriculum at NCE level comprises of various courses like Animal Production, Forestry and Wildlife Management, Bee Keeping, Soil Science, Practicals and so on. The inclusion of engineering courses becomes imperative if Nigeria is to achieve its aim of self- sufficiency in food production. Soyibo (1989) reported that, in general, the attitude of Nigerian students towards the basic sciences tend to decrease in the order of Biology, Chemistry, Physics and Mathematics and that students' attitudes to Physics and mathematics at the secondary school level have a multiplying effect on their performances in physics and mathematics related courses at the NCE level of which agricultural engineering courses fall within the category.

Agricultural engineering is aimed at using engineering knowledge to solve problems in agriculture. The major divisions of agricultural engineering are farm Power and Machinery, Soil and Water conservation, Crop processing and Storage, Farm Structures and Environment, and Farm Electrification. Omotosho (1981) defined agriculture as the production of plants and animals for the use of man. Man's dependence on agriculture is undoubtedly unique, in the sense that it does not only provide food but also creates employment opportunities, feeds the industrial sector as well as provide income and foreign currency through external trade.

The aim of teaching agricultural science is to provide the learner with the opportunity to study his own environment from the point of view of its land, livestock and crops. The teaching-learning process often needs to be assessed. The progress, level of understanding and difficulties in specialized subjects can be assessed. Oyekan (1992) considered assessment as an integral part of the teaching-learning process that would provide a sense of gradual progress, level of achievement and basis for successive improvement of educational programme.

The National Policy on Education (1998) regarded Agricultural Science as a core subject. It is also regarded as a vocational subject and normally categorized under Vocational and Technical Education. Vocational and Technical Education is, however, defined as the aspect of education that leads to the acquisition of practical and applied skills and basic scientific knowledge.

Historically, productivity increases are linked with technological changes and agriculture is not excluded. This makes agricultural engineering very important to a nation build up.

Nowadays engineering has developed into the level of employing Computer Technology in its teaching and application. When the appropriate level of technology was identified and applied, a lot of breakthroughs were recorded.

Rationale for the Study

This study anticipates the following:

(i) Agricultural Science Student (ASS) who scored good grades in mathematics and physics at the Senior Secondary Certificate Examination (SSCE) or General Certificate Examination (GCE) will have better attitudes to Agricultural Engineering Courses (AEC) than those who had low grades in those subjects.
(ii) ASS who scored high grades in mathematics and physics at the NCE will perform better in AEC than those with low grades in the subjects.
(iii) ASS who have knowledge of computers will have better attitudes to AEC than those who do not.
(iv) ASS who show interest in computer knowledge are likely to have scored good grades in AEC than their counterparts who show no interest.

Definition of Terms

ASS - Agricultural Science Student Teachers
AEC - Agricultural Engineering Courses
CAI - Computer Assisted Instruction
ACE - Adeyemi College of Education
NCE - Nigeria Certificate of Education
SSCE - Senior School Certificate Examination
GCE - General Certificate in Education
WASC – West African School Certificate

Computer Technology/Computing - Issues and Trends

With the relatively low cost of personal computers nowadays, individual managers within organizations are independently procuring personal computers for stand-alone applications such as spreadsheet and project management tools. Today's personal computers put processor, file storage and problem solving tools in an inexpensive "user friendly" package.

Funk and Wagnall's (1982) encyclopedia reviewed that computers were previously discovered to be only afforded by large corporations and the government. Today, however, computers are used wherever it is possible to convert a problem into a logical series of steps in day to day living and in any vocation: production machinery, traffic flow control, diagnosing illnesses, teaching, typesetting, space programme, telephone system, agriculture and so on. The difference between computers and most other machines is that computers are general purpose.

Computer Aided Instruction

Computer Aided instruction (CAI) is an integral part of Educational Technology, Ogunmosunle (1998) defined Educational Technology operationally as educational FEMPP, where F stands for facilities, E for equipment, M for materials, P for processes and the second P for people. He relates educational technology to a system with interactive parts without which education will be defective and incomplete. Instructional Technology is a component of Educational Technology. It deals with the systematic and scientific application of instructional materials in the teaching - learning process (Iseyemi, 1999).

The computer is a type of visual instructional material. Visual instructional materials are materials that appeal to the sense of sight and arc very essential in teaching basic principles and concepts to students (Inannoya and Onyeyemezi, 1991). They further submitted that instructional materials arc illustrative and provide assistance for students to receive instructions clearly. Strauss and Kidd (1948) observed that through the use of visual aids, students learn up to 35 percent or more in a given period of time and remember up to 35 percent longer.

For improvement of instruction, systematic planning, wise and skilful use of products of technology should be a basic pre-requisite. In their assertions, Brown et al (1969) stressed that instructional materials (from instructional technology) goes beyond any particular medium or device. In this sense, instructional technology, they said, is more than the sum of its parts. It is a systematic way of designing, carrying out and evaluating the process of learning and teaching in terms of objectives, based upon research in human learning and communication and employing a combination of human and non-human resources to bring out more effective instruction.

The trend of events concerning computer Aided Instruction is somewhat interesting. Dorman and John (1984) wrote that the term "Technology materials" came into prominence in the educational scene during the first two decades of the 20th century. Technology materials include all materials generally used in classroom and laboratory instructions, except those that are verbal symbols (printed) only. However, as from 1947, ideas developed in favour of combining the library with the laboratory

department. It was in the wake of this development that the term "Industrial material or Technological material" evolved. They stated further that in 1955, an Industrial Material Center (IMC) was established and responsible for the acquisition, organization and distribution of all industrial materials used in the learning process.

Methodology

Population and Sample

The population for this study consists of all final year students at NCE Agricultural Science in Nigerian Colleges of Education. Adeyemi College of Education, Ondo is used as a case study.

Instrument

The effect of using Computer Aided instruction on the teaching of agricultural engineering courses was studied by considering students attitudes and previous performances with the aid of a structured questionnaire. The following areas were addressed:

(a) Demographic Characteristics of Students: This was to find out the age of students, their identity and gender. The rationale behind the request for the identity of students was to enable the researcher to cross-check the records of performance of students as claimed. The advantage of this was that it encouraged the students to respond positively by giving valid responses to the questions. This eliminated falsification of facts and negative attitudes often put up by students when responding to questionnaires.

(b) Pre - Entry Qualification.
This was set to find out the qualifications of students when seeking admission into the NCE programme. Their performance in Mathematics, Physics, Chemistry and English at the SSCE or WASC or GCE were requested. Their responses became useful in determining the relationship between pre-entry qualifications and subsequent performances in Agricultural Engineering Courses (AEC).

(c) Performances in NCE Part I
Questions were set to find out the performances of students in NCE Part I in Mathematics and Physics courses. This was to ascertain the possible relationship between their performance in these subjects and their subsequent performances in AEC.

(d) Performance in Agricultural Engineering Courses (AEC)
In this section, questions were asked to find out the actual performance of the NCE agricultural science students in AEC. Courses in agricultural engineering are offered in the 2nd year and 3rd year of the NCE programme. Thus the questions were directed at the final year NCE agricultural science students that had attended classes and been examined in AEC.

(e) Attitude of Students to AEC
Students were required to answer questions on their attitude, problems and interests in AEC. Each question was rated on the Likert scale: Strongly Agree (SA - 4), Agree (A -

3), Disagree (D - 2) and Strongly Disagree (SD -1). This was done to facilitate the assessment and analysis of their responses so as to make reasonable inferences.

(f) Computer Science Appreciation

The respondents were also required to answer questions related to computer knowledge and attitude. This was to make deductions with regards to their performances and attitude and to see the effect this will have on their performances.

Results

With a view of obtaining answers to the research questions, the items of information collected were analyzed and interpreted in the following ways:

Table 1: Demographic Characteristics

	Variables	No.	Percentage (%)
1	Age Range (Years)		
	15 - 1 7	0	0
	18 - 20	1	5.56
	21 - 23	3	16.67
	24 - 26	10	55.56
	Above 26	4	22.22
2.	Sex		
	Male	11	61.11
	Female	7	38.89

The bulk of the respondents fell within the age range 24 26, which is about 56 percent. Only 22.2 % of the respondents were more than 26 years. There were 11 male and 7 female students (Table 1).

Table 2: Pre - Entry Scores

Subject	Qualification	Distinction (%)	Credit (%)	Pass (%)	Fail (%)
Mathematics	SSCE/WASC/GCE	2(11.11)	7(38.89)	9 (50)	-(0)
Physics	SSCE/WASC/GCE	4 (22.22)	4 (22.22)	8 (44.44)	2(11.11)
Chemistry	SSCE/WASC/GCE	1 (5.56)	5 (27.78)	10(55.56)	2(11.11)
English	SSCE/WASC/GCE	-(0)	5 (27.78)	10(55.56)	3 (16.67)

The pre-entry scores of respondents indicated in Table 2 revealed some facts. For instance, the majority of the respondents gained admission into the NCE Agricultural Science programme with passes in Mathematics, Physics, Chemistry and English at the SSCE/ WASCE of GCE level. Furthermore, the grades were particularly poor in chemistry and English language. While only one student had a distinction in Chemistry, 5 had credit, 10 had a pass and 2 failed completely. The situation is almost the same for English Language except that no candidate had distinction and 3 failed. Equally worthy of note was that 4 distinctions were recorded for Physics as against 2 recorded for Mathematics. This might be due to the fact that students had reservations for Mathematics but could do well in Physics since it contains only a bit of Mathematics. No failure was however recorded in Mathematics since it was

compulsory for candidates to have minimum pass in Mathematics at SSCE/WASC of GCE level.

Table 3: Performance in NCE I

Course		A	B	C	D	E
		70	60-69	50 - 59	45 - 49	40 -44
Introductory Mathematics	No	5	6	4	2	1
	%	27.78	33.33	22.22	11.11	5.56
Introductory Physics	No	7	6	5	-	-
	%	38.89	33.33	27.78	-	-

The grades of respondents were checked in the department to confirm their claims in the responses submitted. The result of their performances in Introductory Mathematics and Physics are as shown in Table 3. From the results, about 80% of the students passed Mathematics at credit level while 100% pass was recorded in Physics at credit level. Looking at their pre-entry scores, it would be discovered that 50% had passed Mathematics at credit level and about 44% had passed Physics at credit level. The improvement in students' performances at NCE I could be due to their willingness and enthusiasm to learn in a new environment. The lecturers handling the courses also must have done their job conscientiously. In spite of this, lower scores were still recorded in Mathematics than in Physics.

The performance of students in AEC in higher NCE classes was considered. The result is as presented in Table 4.

Table 4: Students' Performance in AEC in higher NCE Classes

Course		A	B	C	D	E	F
		70	60 - 69	50-59	45-49	40 - 44	39
Farm Power and Machinery	No	7	7	4	-	-	
	%	38.89	38.89	22.22	-	-	
Basic Agric. Water Engineering	No	4	8	3	2	-	1
	%	22.22	44.44	16.67	11.11	-	5.56
Land Surveying and Farmstead Planning	No	5	6	5	2	-	-
	%	27.78	33.33	27.78	11.11	-	-

The result shows that 100 %, 83.33 % and 88.89 % of the respondents scored credit level grades respectively in Farm Power and Machinery, Basic Agricultural Water Engineering and Land Surveying and Farmstead Planning. This high percentage of performance in the two courses compared favourably well with the performance of students in Introductory Mathematics and Introductory Physics.

To study students' attitude to AEC, the Likert Scale was used. The views of respondents to attitudinal questions were rated in the following order:

SA = Strongly Agree (4), A = Agree (3), D = Disagree (2), and
SD = Strongly Disagree (1).

The frequency of responses for all respondents to the identified questions is shown thereafter.

Table 5: Computer Knowledge

	Frequency of Responses				
Item	SA	A	D	SD	Total
(a) Familiarity with the Computer	14	3	-	1	18
(b) In-depth knowledge of how the Computer works.	2	6	8	2	18
(c) Using / handling the Computer	3	9	3	3	18
(d) Knowledge about the Internet	3	2	5	8	18

Table 6: Analysis of Students' Computer Knowledge Using Weighted Scores.

Item	SA 4	A 3	D 2	SD 1	TOTAL	N	MEAN	I
(a) Familiarity with the Computer	56	9	-	1	66	18	3.67	SA
(b)In-depth knowledge of how the Computer works.	8	18	16	2	44	18	2.44	D
(c) Using / handling the Computer	12	27	6	3	48	18	2.67	A
(d) Knowledge about the Internet	12	6	10	8	36	18	2.00	D

Note: I: Interpretation N: Number of Students.

Interpretation Scale
1.00 - 1.44 SD
1.50 - 2.49 D
2.50 - 3.49 A
3.50 - 4.00 SA

Table 7: Attitudes of Students to Engineering Courses and Perceived Learning Problems

Item	SA	A	D	SD	Total
(a) Punctuality to AEC Classes	16	2	-	-	18
(b)Enthusiasm about AEC	11	4	3	-	18
(c) Attitude to AEC Assignments	12	3	2	1	18
(d) Regard for AEC teachers	14	3	1	-	18
(e) Abstract Nature of AEC leading to boredom.	3	3	4	8	18
(f) Boredom due to many Calculations	-	4	6	8	18
(g) Discouragement due to lack of feedback on test and Assignments	1	4	4	9	18
(h) Inadequacy of AEC Textbooks in the Library	9	7	1	1	18

Table 8: Analysis of Attitude of Students to AEC and their Learning Problems

Item	SA	A	D	SD	TOTAL	N	MEAN	1
	4	3	2	1				
(a) Punctuality to AEC Classes	64	6	-	-	70	18	3.89	SA
(b)Enthusiasm about AEC	44	12	6	-	62	18	3.44	A
(c) Attitude to AEC Assignments	48	9	4	1	62	18	3.44	A
(d) Regard for AEC teachers	56	9	2	-	67	18	3.72	SA
(e) Abstract Nature of AEC leading to boredom.	12	9	8	8	37	18	2.05	D
(f) Boredom due to many Calculations	-	12	12	8	32	18	1.78	D
(g) Discouragement due to lack of feedback on test and Assignments	4	12	8	9	33	18	1.83	D
(h)Inadequacy of AEC Textbooks in the Library	36	21	2	1	58	18	3.22	A

Table 9: Prospects of Using CAI / Attitude of Students to CAI.

Frequency of Responses

Item	SA	A	D	SD	Total
(a) Students Attitude to CAI	16	2	-	-	18
(b) Availability of Computers in the School	4	4	5	5	18
(c) Willingness to pursue a higher degree in Agricultural Engineering due to CA1	7	6	4	1	18

Table 10: Analysis of Students' Attitude to CAI and the Prospects of using CAI

Item	SA	A	D	SD	TOTAL	N	MEAN	I
	4	3	2	1				
(a) Students Attitude to CAI	64	6	-	-	70	18	3.89	S
(b) Availability of Computers in the School	16	12	10	5	43	18	2.39	D
(c) Willingness to pursue a higher degree in Agricultural Engineering due to CAI	28	18	8	1	55	18	3.06	A

By these analyses, the respondents showed a strong affinity for the computer. Although majority agreed with having used the computer before, they however showed they had little or no ability for in-depth knowledge and Internet assess dexterity.

The students showed better attitudes to the use of CAI in the teaching of AEC, strongly agreeing to its introduction. This will change their attitudes to AEC and increase their enthusiasm, leading to better performances in AEC.

The attitude of students to AEC was further studied by considering and analyzing some other problems of learning AEC. The responses were quantified using the Likert Scale. The frequency of their responses is shown in Table 7 and the analysis using assigned weights in the Likert Scale is indicated in Table 8. The interpretation of the results obtained is made with the use of the interpretation scale.

The response of students led to some observations indicated as follows:

- Lack of feedback in tests and assignments on AEC do not necessarily discourage the students from working hard, perhaps because of the confidence they had in

their lecturers. It is, however, proper for AEC lecturers to give adequate and timely feedback to students on tests and assignments.

- Students showed that they were not bored with the numerous calculations in AEC. This could be due to their improved knowledge in mathematics at the NCE Part 1.

In general, students showed a positive attitude to courses in agricultural engineering, especially when the computer is introduced in the teaching and learning. Their improvement of the knowledge of mathematics in particular will greatly assist in the understanding of CAI.

The areas in which CAI could be applied is in Visual Instruction, manipulation of data for statistical analysis, surfing or browsing the Internet for latest technology in the field of agricultural Engineering, demonstration of how machines that may not be available really work and accessibility to recent materials in the area of food production technology. This will change the belief that farmers are the paupers in the society and positively influence students' attitude to agricultural engineering in part and agricultural science as a whole.

Conclusions and Recommendations

In conclusion, all the NCE Agricultural Science Student who responded to the questionnaire in this investigation showed positive attitudes to the use of CAI in teaching Agricultural Engineering Courses. These findings were revealed in the study with the use of Likert Scale to measure the attitude of Students to AEC and Computer knowledge. As indicated in Table 8, the students' responses mean scores in the Likert scale for the items on attitude to AEC varied between 3.44 and 3.89, which shows evidence of strong agreement in the scale. The positive attitude of students to CAI in AEC can be seen in Table 9, which indicated a strong agreement (mean of 3.89) for interest in CAI.

A comparison of the mean scores of students' attitude to AEC - 3.44 (Agree) (Table 7) and Students attitude to CAI in AEC - 3.89 (Strongly Agree) (Table 9) shows that Computer Aided Instruction has stronger positive influences on the teaching of agricultural engineering courses if undertaken.

Also, the quality of instruction to the students in AEC and their improved performances in Mathematics at NC'E part 1 were reasons responsible for their positive attitudes to learning more on the engineering line especially through the introduction of Computers. An appreciation could be seen in their performances judging from their pre-entry scores in the sciences.

The Recommendations are:

1. On the basis of the findings that the students under study showed positive attitude to AEC and a better attitude to CA1, it is imperative that CAI will enhance and sustain their positive attitudes. There is bound to be greater positive effect on the attitudes of the students and their performances in AEC if CAI is introduced. A possible way of accomplishing this task of enhancing and sustaining is to provide funds in our tertiary institutions that run NCE Agricultural Science Programme, to be used in providing

relevant Computer Aided Instructional Materials. Computer systems should also be provided. Internet connectivity is highly desired because Internet accessibility is only possible through connectivity. Presently, students are made to go through introductory courses in Computer science at the lower NCE levels to prepare them ahead for an effective CAI programme, this could however be made compulsory for every other level. All these might lead to an amendment or revision of the NCE agricultural science curriculum.

2. The study could still be pursued further by finding out the correlation of Mathematics and Physics pre-entry scores with performances in AEC at NCE level to determine whether it is compulsory or it be upgraded to credit level.

3. This investigation could still be conducted further by repeating same to cover other Colleges of Education to give a more general and valid finding. It could also be embarked on for a span of 3 to 4 years.

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Managing e–learning to achieve education for all in Nigeria

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Abstract

There have been moves by the Nigerian government and stakeholders to develop and improve the educational system in the country. Such efforts include the introduction of modern technological devices for use in schools from primary to tertiary level that could aid teaching and learning. These technological devices are e-learning devices like the computer, internet, telephone and television among others. This paper is concerned with the effective management of these devices without which their purpose and use in schools may not be attained. The problems of e-learning in Nigeria involve under-funding, maintenance, storage and availability. The management strategies highlighted include adequate budgeting for the purchase of e-learning facilities, the supply of modern and current e-learning devices, involvement of external bodies and adequate maintenance. It is recommended that the government should make concerted efforts to encourage the use of e-learning, which is an effective tool to promote mass education. They should also explore the possibility of technological transfer from advanced countries to facilitate electronic learning.

Introduction

There has been tremendous growth in the Nigerian educational systems since Independence. Changes are rapidly occurring due to the improvement in instructional devices, many of which have been fed into the education system to aid learning. New ideas on how to design, develop, deliver and evaluate teaching and learning are currently being introduced so as to make education more functional and its objectives attainable in the nation.

Attainment of education for all by the year 2015, as declared in the World Education forum at Dakar 2000, is the goal of the government and several efforts have been mustered to achieve this. Part of the effort is the introduction of Universal Basic Education which covers Primary and Junior Secondary levels and open and distance learning at tertiary level. Information and Communication technology (ICT) is employed as facilitator for this germane educational goal which involves changes at systems level, school level as well as classroom level.

The effective management of e-learning which is meant for the implementation of the goals of Education is the focal point of this paper. Management of e-learning facilities involves their care and usage for optimization and sustainability after the facilities have been provided by the educational authorities. The situation in the Nigerian educational system reveals the problem of under funding for e-learning devices. Funds to purchase parts are not usually available and even some of the available devices are obsolete so that they need replacement. It appears that fake, and substandard and probably overused materials are been dumped in Nigeria which seems to make e-learning in Nigeria a substandard phenomenon. The new and latest models of facilities in the market are

usually too costly, which makes it impossible to purchase because of the level of poverty of the people. Even after purchase, there is the problem of maintenance because of inadequate training of personnel involved. As a result of these problems, it is imperative to examine how e–Learning devices can be managed effectively in Nigeria to solve some educational problems and eventually make the attainment of the millennium goal for education a reality in the nation.

The Concept of E–Learning

There is still a lack of consensus about what e–learning represents. E–learning cuts across numerous fields of thought and practice: like training and education, learning and knowledge, technology and the investigation of individual market segments. It is used in major sectors like academic institutions, governments, the corporate sector and the community and general consumer sector.

From the outset, e-learning was defined in relation to technology as early as the 1980s. It was used as a shorthand term from learning delivered using any electronic means, especially computers. The United States Commission on Technology and Adult Learning (2001) defined e-learning as instructional content or learning experiences enabled by electronic technology. The department for Education and skills in U. K. (2003) stated that 'if someone is learning in a way that uses information and communication technology (ICT) it is e-learning'. Rosenberg (2001) defined e-learning as the use of a broad array of solutions that enhance knowledge and performance. It involves learners and information technology which exposes learners to contemporary opportunities without the limitation of space and time for the educational system of any nation. It is a social and information technological system that supports learning processes.

These definitions show that e-learning encompasses the learning transaction, and the technology used for the production and transmission of knowledge. The following elements are also revealed:

(a) It involves information and communication technologies.
(b) It involves a network, wired or wireless.
(c) It involves an electronic exchange for the purpose of learning.

It can thus be inferred that e-learning encompasses a wide diversity of practice in a dynamic, rapidly changing field and it has major implications for the teacher, the learner, the institutions as well as the government and the arts of governance.

E-Learning Facilities

The computer: The computer has special attributes, which include speed, accuracy, reliability, mass storage, capability, precision, indefatigability and security. This makes it an indispensable tool in educational institutions for teaching and learning. As a result of this, it can be used in schools for many purposes, such as typing, storing retrieving information, keeping school records, producing students' results and many others.

The internet: Is a world-wide web of interconnected net works hooked together by thousands of computers from organizations and individuals, working together from

regular leased lines and satellites which extend all over the world (Graham 2000) it is a good source of educational information which flows through many interconnected computer networks. Journal articles, conferences, topic from various disciplines in the school curriculum can be got through accessing the Internet.

Mobile phone technology, wireless technologies, television, video tape/Cassette and many more are some of the devices that should facilitate teaching and learning in schools.

Teachers can easily make contact with students on the phone. Assignments can be sent through phones and matters of educational importance can be solved by phone. Educational programmes like debates, quiz competitions, dramas etc are watched on the television to enrich student learning. Some of these facilities are used as audio- visual aids by the teachers.

The Role of E- Learning in the Development of Education

Currently in Nigeria the use of e-learning in the educational sector is still at the rudimentary stage. The educational system is formal classroom-based instruction where the teacher and students are physically present at the same time and at the same place. The teacher uses the traditional method of teaching in addition to some manual instructional materials for teaching. Much of today's technologically based learning is simply an extension of traditional, textbook based learning. As a result of this situation, there is an urgent need to employ modern technological devices in the classroom as well as outside the classroom so as to improve on the present state of education in the nation. Various statistics indicate that majority of Nigerians are yet to be reached (Perraton, 2001). As such modern electronic learning devices like computers, Internet, ICT, etc. currently being used in educational institutions should be carefully handled, effectively managed and adequately provided so that the goals of education can be attained.

The role of e-learning in developing the educational system in Nigeria cannot be over emphasized. The use of e-learning will move education and training away from traditional textbook-based learning to a situation when the user reads content from the screen instead of from a page. It will also truly engage the learner in a give-and-take type of learning that involves simulations of real-world events and sophisticated collaborations with other learners and the instructor. This will no doubt arouse the interest of the learners to learn with ease.

Technologies such as Electronic Performance Support Systems (EPSS) will allow users to receive training at the exact time and place that is needed to complete a task. Learnable Computers will allow augmented reality experiences, in which the user can receive real-time technology based assistance in the actual work environment, as opposed to a simulation in a virtual environment.

E-Learning has the ability to present up to date material. It will be easier for the teacher to change and update material on a web-page based on new information or new needs of the learner. As a result of this, new models for learning are being introduced, most especially models that focus primarily on the needs of the learner instead of on the

abilities of the instructor. Besides e-learning is more learner oriented, resulting in a richer and more dynamic experience.

In addition, information can be immediately received especially on the internet. It is easier and faster. It can provide the right information and skill to the right people at the right time and places. E-learning addresses many issues that traditional learning methods cannot address in the educational system today. For example, the internet complements locally available information, improves and accelerates knowledge flows and can be used to deliver innovative education models to remote areas.

For a nation to enter into the new global economy, education and capacity building using electronic learning devices should be considered as a solution. E-learning is considered as a critical facet of basic development, an alternative medium of capacity building and a means to peoples' empowerment.

Teachers can utilize learning and educational theories to help them to better understand and manoeuvre the tools of technology to effectively analyse and utilize the virtual world (Hamza and Alhalabi, 1999). Human creativity has much to benefit from technologies in education, for example the internet rejuvenates old forms of global communication,
e-mail becomes a supersonic first class postal service without the inconvenience of a long waiting line. Interactive TV video-conferencing handles cultural boundaries geographic environments and global time zones. Today educators can lecture anywhere and at anytime, from distant reaches of this planet to students at other terrestrial locations.

Although new technologies cannot redeem generations of problems in education, they can be helpful tools to guide the hands and minds of creative individuals in achieving educational goals and instructional objectives.

Management Strategies for E-Learning in Schools

The use of e-learning, like any other learning materials, will no doubt facilitate and render more effective the teaching-learning process in educational institutions. One of the goals of the government, as stated in section 9 (04)(F) of the National Policy on Education, is to 'develop and promote effective use of innovative materials in schools' (Federal Republic of Nigeria, 2004) on the grounds however, that this is one of the most neglected areas of educational provision in the school system. This is all the more reason why learning materials, whether electronic or non-electronic, that are available in schools, whatever their quality and quantity may be, need to be carefully and properly managed. Attention must be focused on proper planning and effective management of modern technologies in our educational institutions. The following areas should be considered.

Availability of E-Learning in Schools

It is very important that schools are supplied with e-learning facilities such as computers, internet, television sets, audiovisual aids like radio sets audio cassette/tape recorders, record players and records, video players and tapes, CDs, slide projectors and slides, flip charts and film strips etc. It is unfortunate that in Nigeria any equipment goes

whether obsolete or substandard. Managers should ensure that modern and recent models should be provided. These materials are to be updated from time to time to meet the order of the day. The availability of these resources and their optimum usage is expected. No matter what the physical condition and socio-cultural background of the institution, students and teachers should have regular access to these devices whenever they want to use them. The quality and quantity of these materials should be commensurate with the population of intended users.

Supporting Infrastructure

Studies reveal that the state of the supporting infrastructure for e-learning in Nigeria is deplorable. The two main infrastructures that impinge on e-learning are buildings and electricity. In Nigeria electricity is erratic. This is a militating factor for effective e-learning. Buildings for accommodation and storage are another problem. They are mostly of poor quality and short in quantity. This reemphasizes why the Universal Basic Education under implementation and the general economic reform of the federal Government should focus on adequate provision of infrastructural facilities particularly in educational institutions. Arrangements for alternative sources of power and the purchase of low-energy consuming devices should be made for the institutions.

Another dimension of the building infrastructure problem is spatial deficiency. Resources must be properly kept but it is observed that most schools rarely have special, safe storage spaces to house whatever learning materials that may be in their possession. It has been suggested by Abimbade (1997) that each school should establish a learning resource centre within a specifically designed school building to serve as a central repository for teaching and learning materials. Such School Learning Resource Center (SLRC) should be responsible for acquiring, cataloguing and storing learning materials as well as guaranteeing teachers and learners immediate and easy access to materials.

Maintenance

Maintenance is a general problem in the third world and another area of challenge that demands attention. It is imperative in the management of e–learning resources in schools. Maintenance helps to curtail deterioration and retain their initial qualities. It should involve repair of damaged parts, replacement and servicing of the equipment. The main purpose of maintenance according to Olagboye (2004) is to conserve resources in a condition in which they will continue to render optimum service so as to prevent wastage. Although assistance from donors may be important for the establishment of e-learning devices, it is an unlikely source of support for maintaining the resources once installed. It therefore becomes necessary to recognize that e-learning maintenance becomes a legitimate expenditure in the recurrent budget and as such make provision for it.

Recruitment of Skilled Professionals and Retraining of Teachers

An adequate supply of skilled professionals, workers and citizens trained in computer and telecommunications as well as using other e-learning devices appropriately is clearly required. Currently there are serious supply constraints in the provision of skilled professionals and this is a major, almost permanent challenge at almost all levels of Nigeria's educational system. Many of those who are trained may leave for more

literature positions in the private sector. This problem should be seriously addressed. Teachers and skilled professionals should be trained and retrained so that the needed human resources with up-to-date knowledge are available (Brown 2000). Training should involve all teachers from primary schools to tertiary institutions. The Ministry of Education should not just set out policy for implementation but should also train the personnel that will implement the policies. It is very necessary for all citizens to have some basic familiarity with computers and the internet so as to discourage illiteracy, as pointed out by Rogers (1995): the internet is a gateway to the openness of e–learning and when this happens it will help to increase the efficiency of administration and management of schools. It will also enhance better delivery of the curriculum and a better learning experience. New and current technologies should involve school users and even manufacturers in training, retraining and maintenance of e-learning devices.

Provision of Funds

One of the major problems of education in Nigeria is inadequate financing, therefore, government and other stakeholders should invest adequate resource in the use of communications media in the teaching-learning process, offsetting personnel costs, retraining of teachers, maintenance and servicing of the resources in schools, in cases of breakdown and replacement of worn-out parts and purchase of new facilities, adequate funding is necessary. Alani (2003) stressed that the implementation of technical and technological educational programmes at the tertiary level is constrained by inadequate funding. This should be addressed promptly. There should be special budgeting for the purchase of e-learning devices at all levels of education. The money when approved should be used for what it has been budgeted for.

External Aid

There is need for international aid in this area of education. Managers should source for generous support in cash and kind from local, national and international donor agencies. These bodies could include the government and non governmental organizations (NGOs), corporate bodies, philanthropic groups or individual well- wishers. They can aid in form of service which could be in the form of training and retraining personnel for improved performance. Whatever is donated should be prudently and appropriately managed.

Conclusion and Recommendations

The introduction of e-learning in the teaching-learning process is a step in the educational system. It should cover every segment without discrimination and diversity. Any personnel involved in the transfer of knowledge should be adequately exposed to the use of e-learning devices because of its efficacy and global focus. Concerted efforts should be made by government at various levels to encourage the use of e-learning which is an effective tool to provide mass education. The Nigerian government should explore the possibility of technological transfers from advanced countries to facilitate electronic learning. Imported e-learning devices should be certified to avoid fake and substandard devices proliferating in the market.

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Enhancing teaching and learning of English using new technologies in second language environment

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Abstract

There is a pervasive, thought-provoking and often disquieting question which has intrigued language thinkers and those concerned with the enhancement of teaching and learning English as a second language for many years. How can the problems associated with teaching and learning English as a second language be ameliorated?

This paper therefore directs a searchlight on the plausible influence new technologies can have on teaching and learning of English among second language learners. With the radical change in educational pedagogy, a well designed and orchestrated plan of action with the on-going state-of-the-art technologies will definitely bring about a global reformation and re-assessment of the importance of language education. The traditional method of making students passive listeners is not tenable among the present generation of students who are active, adventurous and highly impatient. Theirs is a digital generation that wants to be involved in what, where and how they learn. It is of no doubt, that, where new technologies are employed in teaching and learning, the process of teaching and learning becomes exciting and thrilling; this encourages students to think and act for themselves, not just be passive absorbers of knowledge. Hence the paper looks at methods of teaching language skills using modern technologies.

Introduction

English language got to some African countries as far back as the 15th century through Europeans who came to trade, explore, Christianize and eventually colonise Black Africans – including Nigeria. Later, it became the official language of many other countries. The multi-lingual/ethnic nature of many of the African countries favours the adoption of English as the official language.

Nevertheless, the local languages thrive along with the English Language. The local language has to be the first language which is readily acquired naturally by the children; hence it has gained prominence before the English language is introduced.
When at school age, the English language is introduced, the pupils have to learn the new language which is foreign and strange to their culture, hence there are so many things to learn. The learners' tough time begins with encounters with rules governing the formation of words and other supra-sentential levels. More often, learners display language interference at lexical, sentence and pronunciation levels. Compounding the problems of the learners is the fact that second language teachers are made to teach second language learners. The limitations of the teachers are obvious and the pedagogical implications are quite unwelcome.

Now, Akinwamide (2006) says one point to note is the fact that the global importance of the English language cannot be over-emphasised; using English has nothing to do with one's nationality, history or interest. English is an international language and every user wants to fall within the good users. However, the process of learning English language after the first language has been acquired has not been favourable hence incomprehensible inputs/outputs are the major flaws of second language learners.

The situation becomes more appalling when a second language teacher whose limitations are observable in pronunciation are the teachers. The learners imitate imperfect models and imperfection is on the increase. Bringing native speakers to teach the second language learners will not solve the problem because language has to do with culture. Hence the need to examine the plausible influence new technologies will have on the teaching and learning of English in a second language environment.

Moreover, the present day generation of students go to lectures without note- or writing pads. Carlson (2005) says 'The students have short attention spans and shun lectures; they want to learn fast but read less; they prefer video, audio and interactive media. They don't carry pencils, paper and textbooks around but are equipped with all kinds of electronic gadgets – the smaller, the better'.

To this end, this paper looks at the assistance that can be rendered in the teaching and learning of the English language with the use of new technologies on some major skills of language viz: Listening, Speaking, Reading, and Writing.

A Way Out of English Language Learning Barriers

I have tried to propose a ten-year programme which at the expiration of the tenth year may turn English as a second language society around. Complaints in academic arena should metamorphosize into research; this in turn makes learning authentic. Where research unknots issues and all stakeholders are involved in understanding real world problems, learning authenticity becomes high.

Technological Needs of Language Teachers

For functional education in the 21st century, language teachers must go along with the technological world. In a world that technology has reduced to a global village, no professional can afford to be conservative. Jibowo (2005) says there ought to be an increased interest in the analysis of learners' needs at the level of the language teacher preparation programme.

The above becomes necessary if English Language teachers and teaching are to be made current and functional. No educational ideology can afford to neglect the teacher factor and stand. Teachers of English must be equipped with the state-of-the- art technologies so as to be abreast of students.

Interactions within the countries of the world readily expose the background of every actor in the theatre of this world. With the inventions of new technologies, modernity has conquered mediocrity in the advanced countries of the world. There is no country that stands in isolation that can develop. English Language teachers are in the position to help in bridging the digital divide since language explains all disciplines and

operational words of technological-know-how. Moreover, discoveries and research are essential factors of development. Statistical data are better analyzed with computer and data processing machines. Where these are lacking, this may pave the way for retardation and backwardness and the backwash effect is poverty.

Advance Organizer for the Development of Reading Skills

Advance organizer can be employed as an effective and essential pre-reading technique for the teaching and learning of reading comprehension. It comes before the reading material thereby preparing the mind for comprehension.

Lawal, Adebola and Adebileje (2005), highlighting the role of Advance Organiser, said it aimed to enhance proactive facilitation and minimize proactive inhibition. This in essence gives vent to the activation of the right schema on any given passage. The organizer helps a lot to bridge the gap between what the learner knows and the new things he/she needs to know based on the given passage. Organizers can be employed to teach the orthographic make-up of any given passage. This makes the terms and pattern clear in application and enhances assimilation. Egbugara (1985) sees advance organizer as an instructional strategy like verbal ability. This is essential for students to benefit immensely from Reading Comprehension Classes. From the other side, it makes the teacher's job easy and smooth-sailing.

Verbal organizer can also go along with pictorial organizer. Pictorial organizer incorporates graphical information with the cognitive structure creating an imaginative effect in the students. All these facilitate teaching and learning of English Language in a second language environment.

Developing Listening Skills through Audio/Radio Technology

Listening skills are a very important language skill that play an active role in the teaching and learning processes. Ige (2005) quoting Wolvin and Coakley (1985) sees listening as the process of receiving, attending to and assigning meaning to aural stimuli. Listening involves acceptance of input into intake for output. Listening complexity arises as a result of fleetingness of speech. Hence, concerted efforts must be made and appropriate technology must be employed to teach and develop listening skills.

The use of radio/audio technology can be of great assistance to the teachers' effort. This has been employed by the BBC English Radio 'Radio English Direct Programme', which is an English Language teaching series for Africa. This method if well utilized will help a lot in comprehension of ideas, pronunciation of words and application of meanings.

Other areas where new technologies can assist proficiency in English among learners of English as a second language include: the use of CD-Rom to teach word usage and pronunciation; TV and Computer Word Games; E-learning; on-line teaching and learning; and Mobile Learning.

In a world that geo-politics and religion have tried to balkanize, English language as an international language will do a lot to reduce schism and suspicion if it is well taught

and understood. The third world can only be developed when correct meanings can be attached to the words and actions of the industrialized world. Hubbard (2005) says, at the bottom of every confusion and alteration of meaning is the misunderstood word or symbol. This in essence becomes false datum which is what is required to establish acrimony and misconception among people.

Teaching and Learning via Online Simulations

This is another way of Conceptualizing Learning. This reduces the work of the teacher. Alena (2006) says 'Research shows that computer-asserted learning engages learners, promotes active learning and develops autonomous learning'. The students are taken through a series of stages in a cinematographic presentation. For instance, students may watch a movie that states the components of process writing in the development of writing skills. Later the students may be given another movie showing how the activities in the first movie are brought together. The next stage shows the concatenation of all the earlier advances and this shows how writing is perfected. Now students can attempt to make a similar chain of activities and eventually come up with exciting revelations on writing skills. This shows how learning can be developed and teaching can be enhanced in a Web-based environment.

Technological Advances in the two decades have reduced to the minimum the all-pervading anxiety in the field of teaching and learning. For instance, computers have become crucial components of information processing research management which every effective and diligent scholar requires for an understanding of their fundamental components and processes as well as appreciation and utilization of their capabilities in data analysis.

Word Processors and the Teaching of Writing

McGreal (1986) says Word Processors can serve as the device par-excellence for promoting the effective learning of the mechanics of good writing. Collier (1982) believes that the word processor promotes surprise, innovations and serendipitous learning. Better ways of expressing ideas emerge with the word processor. Writing in this method favours the employment of the process approach where writers engage in pre-writing, drafting and editing before the final draft. Students writing in a second language face a lot of difficulties as a result of writing in a different language which is foreign to their culture and comprehension. Hence, the process of writing in stages prior to the final writing gives a kind of advantage to the developing writers.

Using Projectors to establish "Objects" of Study

More often students encounter problems as a result of lack of the real object of study. There are some objects of study that cannot be brought to the classroom, for instance, immovable objects such as:
* Ocean * Sun * Caterpillar/Tractor * Growing Embryo * Court in Session

Hubbard 2003 identified the lack of the object of study as a barrier to understanding. This makes students go blank since he/she has no contact with the object of study. Learning becomes easier when students can see, touch or feel what they are studying about; while the lack of the real object of study leads to frustration and

incomprehension. Projectors can be used to give picture of the ocean, a court in session, the sun and other immovable or scarce objects of study.

Projectors can also be used to teach Vocabulary Development in a pictorial form. Terms are explained using pictorial illustrations which research has proved and adjudged a better way of gaining and retaining understanding.

Projectors can also be employed to show speech making mechanisms. Right from the initiation of air in the lungs to the places and manner of articulation of sounds, all these can be made live via electronic projectors; especially where there is no language laboratory.

Conclusion and Recommendations

In summary, no nation can afford to play with the education of her citizens and reap development and success. The world is technologically net-worked, hence the need for all and sundry and stakeholders in the field of teaching and learning to take a cue and be technologically sensitive. The digital divide between the industrialized world and other less-developed countries can only be bridged when technology is employed to unravel the technical and cultural myth in learning English in a second language setting.

Interaction goes on within and outside the geographical boundaries of every nation. One must speak and the utterance must be internationally acceptable, socially intelligible and educationally impressive. Development can not be achieved in isolation. The role of language cannot be down-played in every society. The digitally conscious world has a lot to offer; then all avenues must be sought and opportunities utilized for the emancipation of the less developed.

- To bridge the digital divide between the developed and less developed countries of the world, the world's most spoken language – apparently the language of the industrialized world must be understood.
- English Language teachers in multilingual nations can be better equipped with the use of new technologies to make teaching easier, faster and better taught.
- Research on how to use the state-of-the-art technologies to explain complex areas of language teaching and learning will eradicate frustrations of learning English as a second language in multilingual settings.

1. Therefore, language teachers should be given orientation on how to use new technologies.
2. The provision of these modern gadgets like computers, advanced organizers and radio/audio equipment must be made available.
3. Language laboratories must be made available for all in the field of language education.

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Professional development for the new technology among University lecturers in Nigeria: challenges and prospects

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Abstract

The educational system in Nigeria requires competent, relevant and up-to-date educators to meet the challenges of new technology (NT) in teaching and learning. This study, therefore, examined the status of professional development for NT, professional challenges facing lecturers in the use of NT, the efforts of University administrators in developing lecturers for NT, and lecturers' participation in professional development for NT. This study is a piece of qualitative research using unstructured interview, observations and participatory experience. The study revealed that lecturers are yet to benefit significantly from professional development for NT. The challenges facing lecturers in the use of NT include: little knowledge of computers, the internet and their usage; marginal integration of NT; reliance on traditional methods of teaching; and little time to devote to the use of computers and the internet. It was also revealed that University administrators are yet to make substantial efforts in organising explicit programmes for lecturers to develop so as to meet challenges of NT. It is recommended that the government and University administrators should make deliberate efforts to develop lecturers to meet the challenges of NT. Individual lecturers should show readiness for personal development for the NT.

Introduction

Professional development for NT is of paramount importance in the age of information technology (ICT). The educational system in Nigeria has started making use of NT in its teaching and learning activities, although the use of the NT is at a low ebb. According to Igwe (2005) ICT products such as interactive radio and television, video conferencing, internet based virtual communities, and web publishing are available to less than 2% of the population. Okorie, Agabi and Uche (2005) said that academic staff in Universities have moderate knowledge in the use of computer and ICT, and there was low periodic training for the academic staff on the use of ICT. They were also of the view that there was low level of application of ICT in teaching; however there was moderate application of ICT in research and publication. UNESCO (1998) observed that to effectively harness the power of the new ICT to improve libraries in Nigeria, teachers must have the knowledge and skills to use digital tools and resources to help all students achieve high academic standards. It seems lecturers are still faced with professional challenges that could constitute constraints on effective use of NT.

Professional Development Challenges

In this age of ICT, teachers are still of significant importance. Jones (2003) was of the view that the future of teaching is largely in the hands of the teacher education provider. Teachers are still the portals through which students are given opportunities to incorporate forms of computer enhanced learning, and no matter what the mandate and

expectations of educational systems, in the end effective learning is very dependent on the competence and will of the teacher. Although there is a dramatic growth in the availability of technology in schools, there is still a great deal of evidence that teachers do not use technology as expected (National Centre for Educational Statistics, 2000). Farrel and Wachholz (2003) said that the limited use of technology for teaching was not only due to lack of equipment but also due to teachers' knowledge, skills, beliefs and expertise.

According to Vrasidas et al, a commonly cited obstacle to ICT integration is the lack of teachers' content technology and pedagogical knowledge. McMillan, Culps, Honey, and Mandinach (2003) in their retrospective of twenty years of Education Technology policy, said that "Teacher professional development has been one of the enduring themes across the past twenty years and is often highlighted… as the single most important step towards the infusion of technology into education". According to Jones (2003), educational theories and pedagogic constructs necessary for technology already exist but, unfortunately, many teachers have not been trained to use them. To assist future teachers, it is necessary that educational systems and employers indicate to teacher education providers which models they would expect teachers to follow.

Learning technology seems to face the challenge of teaching staff perceptions towards the new technology. OECD (2005) was of the view that resistance to e-learning by Faculty members may partly be due to their perceptions of the limitations of e–learning. E-learning and the sharing of information might conflict to some extent with the professional culture of academics, based on autonomy and a reward system often based on research. Teachers' perceptions have really affected the use of technology, hence it retards usage. Cuban (1993) provides an explanation as to why new technologies have not changed schools as much as other organizations. He said it was due to cultural beliefs about what teaching is, how learning occurs, what knowledge is proper in schools and the student-teacher relationship which dominate popular views of proper schooling. Dawes (1999) discussed how the notion of teacher resistance to change is prevalent, particularly in work dealing with the introduction of NT. He said 'teachers' resistance is a stereotyping of the profession'. Bates (2001) was of the view that the professors and instructors need to be convinced of the value of e – learning, and trained to understand its educational and technical requirements.

Teachers have been facing certain constraints in taking up ICT. The school as an institution gives little time to teachers to manage and familiarise themselves with ICT (Robertson et al, 1996). Due to pressures of work inside and outside the classroom, timetabling does not allow time for such learning. As well as lack of time, schools provide no supportive network for teachers who are not confident enough to take up ICT (Rosen & Weid, 1999). Teachers need to be provided with adequate facilities and training to be able to use those facilities in order to progress in a technology-rich context (Shazia 2000).

Strategies for Professional Development

Knowledge and skills acquired by teachers would significantly enhance the use of e-learning in the educational system. The goal of any professional programme (PDp) is to inform and change the teacher behaviour as a result of new information. The aim of any sound PDp is to develop a belief about technology professional development that

includes the idea that curriculum drives the use of technology, and not vice versa, and that empowered teachers will find appropriate ways to include technology with their ongoing instruction (Bailer and Powell,1998).

In–service training for teachers to develop in the use of e–learning for education at the school level is pertinent in this age of ICT. Furthermore, in-service training for teachers to develop as online educators would bring significant progress to the use of online Programmes. According to Salmon (2000), online teacher training has been focusing on in–service teachers who often have many years of experience in the traditional classroom. Currently online practitioners are almost exclusively drawn from ranks of experienced face–to-face teachers (Salmon, 2000). There is a variety of professional development courses and programmes, including structured professional development, web–based community building activities, volunteer teaching, as well as conferences and mentoring, which are designed to train in–service teachers to become effective online teachers (Schofield et al 2001).

The need for prospective online teachers to immerse themselves as online learners, and to learn by doing is critical to an online teacher training Programme (Crichton & la Bonte, 2003; Hansen and Salten, 1999). The teacher who has first-hand experience as an online learner will be able to determine its complexity, benefits and compatibility with his or her own goals and philosophies (Surry, 2002). In terms of innovation adoption, teachers who have the opportunity to try an innovation, such as online teaching and learning, are more likely to adopt it than those who do not have such an opportunity (Roggers, 1995).

Pre–service education of teachers in this age of ICT should incorporate online pedagogical practice. Crichton (2002) was of the view that the time has come for a new model that introduces pre–service teachers at a formative point in their teaching career to the emerging body of knowledge of effective online pedagogical practices.

Theoretical Framework

The transformation of classroom technology from hardware and software into tools for teaching and learning depends on knowledgeable and enthusiastic teachers who are motivated and prepared to put technology to work on behalf of their students (CEO Forum on Education and Technology, 1999). E–learning has a powerful part to play, not only in meeting the needs of learners, but also in the development of those involved in teaching and supporting learning. With an ever-increasing use of ICT to support learning in schools and daily exposure to technology in every day life, teaching practitioners are presented with a rising demand for e–enabled learning experiences from learners of all ages. All teachers and teacher trainers should embrace e–learning professional development (epD) and acquire the skills required to enable them to appreciate the use of technology in their professional practice (LSN 2007).

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Mandinach and Cline (1992) described four stages of technology use. Survival stage is when a teacher struggles against technology and doesn't change the status quo in the classroom. In mastery stage a teacher has increased tolerance to hardware and software problems, has increased technical competence and can troubleshoot simple problems. In impact stage a teacher regularly incorporates new working relationships and classroom structures, balances instruction and construction, and is rarely threatened by technology.

He regularly creates technology-enhanced instructional units. At innovative stage a teacher takes a full advantage of a technology-enhanced curriculum and learning activities (Harvey, 2003). Nochols (2003) in his theory of e–learning hypothesized that 'the choice of e–learning tools should reflect rather than determine the pedagogy; of course how technology is used is more important than which technology is used'. He further explained that technology is pedagogically neutral and can therefore be applied to all the pedagogies as listed by Weller (2002), which include constructivism, resource-based learning, collaborative learning, problem-based learning, narrative-based teaching and situated learning, it followed then that poor implementation of technology must reflect poorly implemented pedagogy

The purpose of this study was to examine the challenges facing teachers in the use of new technology, their level of participation in staff development activities, and the efforts of University administrators in enhancing the professional development of their lecturers for the new technology. The study was designed to answer the following questions:

1. What are the professional challenges facing lecturers in the use of new technology in education?
2. What efforts are University administrators making to develop lecturers for new technology?
3. What is the lecturers' level of participation in professional development for new technology?
4. What are the perceptions of lecturers on the use of technology?
5. How have the lecturers been making use of the new technology?

Methodology

This study is a qualitative research, which gathered information from academic staff of universities in Nigeria. The information was gathered using unstructured interviews, using both face-to-face and telephone methods. Participatory experience and observations were used to supplement the data.

Study Outcomes

i. Professional challenges facing lecturers in the use of new technology in education:

Academic staff are facing certain challenges in the use of NT. Some of the lecturers have little knowledge of computers and the internet and their usage. The skills for developing online courses are not yet developed, they still lack adequate knowledge of the use of technology, hence integration of NT into classrooms is still marginal. Many lecturers still rely on traditional methods of imparting knowledge. A large number of lecturers still find it difficult to devote much time to the use of computers and the internet. They perceive internet browsing as time-consuming, hence they are ignorant of up-to-date information required for development and progress in education.

ii. Efforts of University administrators to develop lecturers for the new technology:

University administrators are yet to assume the position of developing lecturers, most especially for NT in teaching and learning. Although some University authorities have

been making provision for computer and internet services, they are yet to make explicit arrangements for lecturers to develop for NT. Many lecturers are making personal efforts to develop, hence lecturers are still made to learn how to make use of NT in haphazard, uncoordinated ways. Little attention has been paid to school based seminars and lectures for professional development for NT; they found it difficult to provide opportunities for lecturers to attend international conferences so as to share ideas with educators and practitioners in other parts of the world.

iii. **The use of the new technology by lecturers:**
Lecturers have been making use of NT mostly outside the classroom in the form of giving assignments to students. Computers and the internet have become the library for many and resource material centres for teaching and learning for many lecturers. Many educators have been making use of the internet to obtain research resources. However, many lecturers have not started using the internet because they have devoted little or no time to its usage. Many are yet to learn how to access the internet, therefore they are yet to benefit significantly from its usage.

iv. Perceptions of lecturers on the use of technology:
Many lecturers have positive perceptions of the new technology. They perceived it as a revolution that has come to save education in terms of accessibility, quality and education for relevance. They also perceived it as valuable and useful for enhancement of their job in terms of preparing their work. However they perceived it as time consuming and expensive.

v. **Lecturers' level of participation in professional development for the new technology:**
Educators are yet to benefit significantly from professional development for the new technologies. Some lecturers agreed that they have been gaining knowledge on the importance and usage of new technology from seminars and conferences, although they agreed that there have been few explicit seminars on professional development for the new technology. A large number of lecturers agreed that they have been learning about usage from the internet and also from colleagues. None of the respondents had been involved as an online learner

Conclusion and Recommendations

The educational system in Nigeria requires competent and up-to-date educators, most especially for new technology. It is high time the government and the school administrators started making deliberate efforts to develop educators to meet the challenges of NT. Preparation for NT should include: pre-service training, in–service training in the form of collaboration, mentoring and structured professional development. University administrators should encourage academic staff to undertake professional development by granting them sponsorship for national and international conferences and workshops. They should also organize school based seminars on NT. Individual educators should devote more time to the use of computers and the internet and show interest in web–based professional development, conferences, seminars and mentoring.

The development of new technology in Nigeria would be enhanced if more attention was paid to the professional development of educators. The knowledge and skills

developed by educators could bring impetus and progress in the use of NT in Nigeria. The available facilities would be put into use and students' interest would be aroused in the used of NT for learning. Agitation for more NT facilities would spring up with the knowledge of its usage among the educators. NT would therefore enhance open and distance learning in Nigeria.

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Mobile learning paradigm in Africa and the problem of the digital divide

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Abstract

Distance and open learning in Africa became prominent in the 1970s when access to face-face learning became costly. E-learning came later to enhance existing pedagogy and was exploited in classrooms to the advantage of both students and staff. The traditional classroom is now being reshaped through the agency of wireless devices allowing for a transition from formal courses to a variety of learning experiences, blending e-learning, knowledge management and performance support. In today's Africa, there is a pragmatic revolution in the teaching-learning paradigm in favour of mobile learning, where traditional classroom and distance open learning shows preference for m-learning as an extension of e-learning. This paper enumerates some of the initiatives made by African Governments and succinctly presents the hurdles before the growth of mobile learning in Africa can overcome the widening Digital Divide. The imperatives from the developed world and its implications on Africa are discussed, in anticipation of achieving the Education for All (EFA), Internationalization of Education and hence, the Millennium Goal for Education in 21st Century Africa.

Introduction

Mobile learning in Africa continues to gain acceptability and rapid development with the introduction of new technologies like mobile phones, Internet and computers into teaching and learning. There is, however, the need for emphasis on mobile learning (m-learning) in the African (or third world) setting. The complex heterogeneity of the African social milieu, coupled with economic and educational retardation, unflatteringly point to the need for flexible m-learning that will be cheap, accessible, affordable and mobile!

The traditional classroom is already being reshaped in the developed world through the agency of wireless devices, revealing an increasing gap between student expectation and teacher preparation dealing with, and embracing new technologies. Mobile learning, according to Devinay & Koschembah (2004), can be particularly suited for 'just in time' education. The vision of mobile learning in transferring from formal courses to a variety of learning experiences, is blending e-learning, knowledge management and performance support.

In most countries of Africa, particularly the Western coast, from Nigeria – across Ghana through Senegal, to Guinea, there is a tri-chotomous division of the population into the *riverine*, *agrarian* and the *Nomadic* dwellers (Abissath, 2005; Jegede, 2002). Access to education has been predominantly disproportionate among them, in favour of the agrarian dwellers until in recent times when mobile technology is available to bridge the communication gaps between these stratifications. The prospect of mobile learning in Africa is, therefore, considered in this paper as a direct function of access to new teaching-learning technologies (which are also to be differentiated from latest technologies). The disparity between the developed and the developing world, particularly Africa, in the development, acquisition and availability of mobile technologies, is still alarming. The problem of the Digital Divide is hence real in relation to the status of mobile learning between the *rich* and *poor* countries of the world. The concomitant effect of the latter is the deviation of the privileged societies from global initiatives of rapid internationalization of education and Education For All (EFA) committed to achieving the Millennium Goal for Education. The situation in South Africa with the rapid development of mobile learning, driven by modern technologies, should be an encouragement to the developed world and make them focus on Africa for total educational emancipation via mobile learning.

Incursion of military regimes in Africa and its consequences

The military incursion into the political landscape in most African countries, shortly after 1960, brought economic and educational woes. The Nigerian economy went c*omatose* as a result of the incessant military take-over of civilian regimes, culminating in a near collapse of the entire educational systems. The experiences of other African countries like Ghana, Uganda, Liberia and, until recently, Ivory Coast were not different. Poverty and corruption became part of the evolving societal malaise, precipitating technological backwardness. Most African countries then (and still) relied on the developed world for imported technology (Bandele, 2002).

Until recently, therefore, traditional education was complemented by distance and open learning in response to the sudden upsurge in the desire for Western education by Africans. In today's Africa, there is a pragmatic revolution in the teaching-learning paradigm in favour of mobile learning initiatives, where traditional classroom and distance learning had achieved less, due to the constraints of new technological support. The uniqueness of mobile learning in Africa hence lies in its tendencies for access to internationalized education by the predominantly disadvantaged riverine and nomadic segments of the countries in Africa (Abissath, 2005, Jegede, 2002, Alexander, 2004), particular those lying on the West African coastal regions. Suffice to state here that m-learning is a vision possible in Africa, but with necessary western support with new technologies.

This paper differentiates between teaching-learning with mobile technologies in non formal and formal settings in Africa. The non-formal mobile learning is here explained as learning that goes on with mobile technologies outside formal classrooms, without strict pedagogical methodologies. Mobile learning in Africa is still non-formal, self–initiated with little or no Governmental support, except possibly in riverine and nomadic settlements (Alexander, 2004). The same cannot be said of mobile learning in the developed world like in the United State of America (USA) and the United Kingdom

(UK) with mobile technology revolution. According to Wagner (2005), the mobile revolution is finally here (USA). He said further that wherever one looks, the evidence of mobile penetration and adoption is irrefutable – cell phones, PDAs (Personal digital assistants), MP3 players, portable games devices, handheld, tablets, and laptops abound. In the US, (and UK) according to him, no demographic is immune from mobile revolution, from toddlers to seniors!

The point being made here is this – mobile learning in Africa is still predominantly non-formal traceable to the use of cell-phones, lap-tops and notebooks and other wireless devices by some privileged few, and that there is still clear evidence of sharp disparity between available new technologies in Africa and those of the more advanced societies.

Initiatives of Governments in Africa on mobile learning

M–learning initiatives in Africa are not only recent but restricted. E-learning first gained popularity and is currently attracting Government attention thereby enabling computer and Internet education to have prominence in the school curriculum from pre-primary to secondary and even University levels (Eagle, 2006).

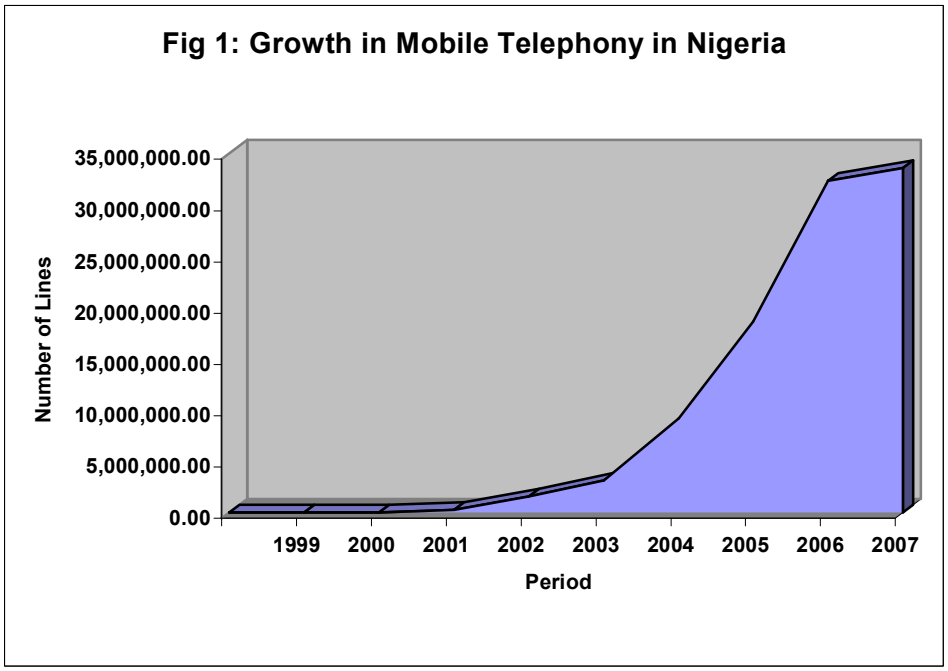
It is however necessary to understand that m-learning is an extension of e-learning. According to Brown (2005), mobile learning is a natural extension of electronic learning (e-learning). Also explaining the restrictiveness of m-learning in Africa, Brown wrote that wireless and mobile technologies make it possible to provide learning opportunities to learners that are either without infrastructure for access (for example rural learners-riverine and nomadic learners) or continually on the move (for example business professionals). Apart from the use of ICTs to support education, which was a significant improvement on the use of radio and television, the use of communications connections to aid learning involves linking computers through a variety of connections including telephone lines, fiber optic cables and satellites (Murphy, Anzalone, Bosch, & Mouton, 2002).

The introduction of mobile phones into most African countries stands out as a most welcome *initiative* in pursuance of the enhancement of mobile learning. In Africa, the progress in this regard has been steady. The Nigerian Communication Commission (NCC, 2007) argued that since May 1999, the Federal Government of Nigeria has pursued an aggressive market liberalization policy, and today, Nigeria, according to them is perhaps the most liberalized telecoms market in Africa. 21 private operations have added about 520,000 new lines (representing about 51% of total fixed lines connected). The total number of connected mobile telephone lines of 10.2 million, as at the end of 2004, which represents about 291% increase over December 2003 (NCC, 2007). The teledensity profile of the country increased dramatically to about 8.5 from 1.89 in 2002 and 3.35 in 2003. The subscriber data from 2001-2007 is as given in table 1, and figure 1.

Table 1: Total connected lines and Teledensity from 2001- Jan, 2007.

OPERATOR	Dec-01	Dec-02	Dec-03	Dec-04	Dec-05	Dec-06	JAN-07
Fixed	600,321	702,000	872,473	1,027,519	1,223,258	1,687,972	1,704722
Mobile	266,461	1,569,050	3,149,472	9,174,209	18,587,000	32,322,202	33,603761
Total	**866,782**	**2,271,050**	**4,021,945**	**10,201,728**	**19,810,258**	**34,010,174**	**35,308483**
Teledensity	**0.73**	**1.89**	**3.35**	**8.50**	**15.72**	**24.29**	**25.2**

*** Teledensity was calculated based on population estimation of 126 million people up till Dec 2005; from Dec 2006, teledensity population estimate of 140m.**



The above are typical and representative of the inroads that mobile technology is making in Africa. These significant initiatives of market liberalization, with regards to mobile technology devices create a solid foundation for mobile learning in Africa. For example, Africa is currently the fastest growing mobile market in the world http://web.mit.edu/eprom/index.html. There is now learning for mobile users in Kenya (Eagle, 2007); and mobile Internet in Ghana (Abissath, 2005), and mobile wireless learning in South Africa.

Intention of Governments on mobile Learning

The five main National goals of Nigeria as stated in the National Policy on Education (2004) reveal to a greater extent the intention of Governments of African countries on the exigencies of mobile learning for goal achievement. They are the building of

- a free and democratic society
- a just and egalitarian society
- a united, strong and self-reliant nation
- a great and dynamic economy, and
- a land full of bright opportunities for all citizens (P7 section 1).

The support for mobile learning is hence sacrosanct from the fact that traditional and distance learning appear to require m-learning support to achieve the intentions of Government as amplified below:

Emancipation
To facilitate social, political or legal freedom is dependent on access to globalized education that can break local barriers and geographical limitations which will allow for interaction with other cultures, sub-cultures and systems of the larger World.

Egalitarianism
To have a nation, in the present millennium, that should be fair to all her citizens with the provision of equal rights and privileges and for the jinx of inequalities within each nation of Africa to be broken via greater emphasis on mobile learning.

Enlightenment
Many African dwellers are living in unpardonable ignorance occasioned by lack of education, religious confinement and cultural biases. Mobile learning is needed to reach these categories of people without the constraints of time, place or access.

Elitism
The instability in most African countries is attributable to elitist dominance of the educationally disadvantaged majority. There is the need to raise the elitist status of every segment of society through the use of mobile learning.

Entrepreneurial
Cell phones and wireless devices are to allow for the learning and selling of entrepreneurial skills across cultural and geographical boundaries. The traditional system of education lacks this ingredient! http://web.mit.edu/eapron/index.html.

Economy
A worthwhile economy is knowledge driven. The African economy cannot, and should not, be further destroyed with primitive economic initiatives where the economy of the developed countries is technology driven and growing. Mobile learning should be designed to be futuristic and ambitious to reverse the poverty trends in African Nations.

The intention, or goal, of Governments as stated in the policies on education should correspond to the philosophy of mobile learning in the evolving African societies. Brown (2005) submitted that in the context that m-learning has the potential to make learning more widely available and accessible than an e-learning environment, it can contribute to the quality of education as it offers opportunities for the optimization of interaction between lecturers and learners, among learners, and among members of the communities of practice (COPs) (Hvorecky; 2004).

Imperatives of the Digital Divides vis-à-vis the developed nations

The *Digital Divide* between the technologically privileged and less privileged countries is real. According to Dickard & Schneider (2007), the *Digital Divide* is most commonly defined as the gap between those individuals and communities that have, and do not have, access to the information technologies (Becta, 2001). The major problem in the world today is that technology continues to widen these gaps. According to Glef (2007),

the documentary series *Digital Divide* (PBS, Spring, 2000) explores the role of technology in widening gaps in the society, especially among young people. It affects classrooms, gender, race, and work! In the most elementary form, *Digital Divide* is often used to describe the disparity in *access* to technology between the '*haves*' and the '*have nots*'.

Availability and access to new technologies in Africa is still disproportionately low when compared with what exists in the developed world. The little progress made in Africa on access to mobile phones and Internet is suspect. The so-called 'new' technologies that are available in Africa are not the 'latest' technologies. This again, raises the issue of '*Multiple Divides*'. According to Becta (2001), *Divides* can be seen to exist in relation to:

- ownership of new technologies
- access to those technologies

The ownership advantage confers the right of first hand access to new technologies on the developed world while the developing world, Africa typically, only has access to second hand 'new' technologies. Ramanujam (1999) explained that in spite of general enthusiasm for the globalising nature of communicating technology, the great *Divide* between the developed world and the developing world persists. In poor countries (unlike in USA, UK, France, Germany and the entire Western Europe), according to him, it takes at least a decade to have access to any type of technology, and by the time they acquire it, that technology itself has become outdated. There is no visible significant deviation from this scenario in 2007 Africa, since this 1999! The *Divides* with regard to access therefore constitute an incontrovertible problem that has enough potential to dampen the vision for mobile learning in Africa.
Table 2 from the World Bank survey of available technologies compares the 'haves' and the 'have nots'.

Table 2: Education technologies available per 1000 persons

Region/country	Radios (1996)	Television (1997)	Personal computers (1997)
Africa	54 (Angola) 238 (Ghana) 256 (Malawi) 316 (South Africa)	5 (Ethiopia) 26 (Uganda) 64 (Ivory Coast)	> 1 (Burkina Faso) 9 (Zimbabwe) 42 (South Africa)
Asia	195 (China) 432 (Malaysia)	124 (Cambodia) 69 (India)	4 (Pakistan) 399 (Singapore)
LAC	283 (Nicaragua) 610 (Uruguay)	294 (Ecuador) 323 (Jamaica)	3 (Guatemala) 54 (Chile)
ECA	404 (Lithuania)	469 (Czech Republic)	348 (Switzerland)
North America	1,078 (Canada)	847 (USA)	407 (USA)

Source: World Bank in Murphy et al (2002)

The gap as shown continues to be widened, and in respect to other mobile wireless devices, the situation is the same.

To achieve the Education For All (EFA), Internationalization of Education, and hence, meet the Global Millennium goals on education, there are some imperatives in the interest of mobile learning in Africa that should be realistically pursued towards

bridging the *Digital Divide* instead of widening it. The developed countries are expected to do as follows

- Export latest technologies that will enhance mobile learning into Africa for easy access to real new mobile technologies.
- Examine the current status of mobile technologies in Africa in relation to mobile learning in the developed world in order to offer necessary assistance and hence bridge the widening divides.
- Exclude poor nations from high export tariffs and stringent conditions attached to transfer of technologies that make new technologies unaffordable by such nations.
- Expand available opportunities and programmes for capacity training for Africans in the use of new technologies, particularly those required for mobile learning.
- Exhibit clear intentions to bridge the widening gaps between Africa and the developed world regarding access to latest mobile technologies.
- Explore a systematic procedure for internationalization and globalization of education through global emphasis on mobile learning.
- Express, through global connections, the need to tackle social exclusion of the less privileged nations and promote equality among people without prejudice to colour, race, religion, culture and social status.

Implications for mobile learning development in Africa

The foregoing discussions delved into some contiguously related paradigms of mobile learning in Africa and the delimiting influence of technological *Divides*. It emphasized the important roles to be played by the developed world in the actualization of mobile learning in Africa. All these have implications for mobile learning in 21st Century Africa. According to Murphy et al (2002), the educational implications of helping African countries make the transition to successful participation in the emerging knowledge–based global economy are considerable. African countries must rise up to the challenges of raising the mobile learning initiatives to global standards.

There is therefore the need for the following:

1. Institutionalized mobile learning. The non-formal aspect of mobile learning in Africa requires attention. Like e-learning, mobile learning should be supported by Government and made accessible to prospective mobile learners from elementary to higher education.
2. Internationalization of mobile learning. African countries should take advantage of the wireless devices and mobile technology to evolve flexible 'cross-country' curricula that will connect each country with the rest of the world.
3. Integration of technology–driven learning initiates like e-learning, Distance learning, Open learning and mobile learning for optimum learning output.
4. Inter/Intra country collaborations in Africa for capacity building for the enrichment of mobile learning in Africa.
5. Involvement of African countries in global plans for mobile learning, if and when such situations arise.
6. Interdependence between African countries on transfer of resources: human and mobile.
7. Importation of new and latest technologies without minding the cost, for realistic globally acceptable mobile learning programmes.

Conclusion

Mobile learning is gradually reshaping Distance and Open learning, and even e-learning in the teaching-learning process in Africa. It is a type of learning that has been found to be cheap, affordable and accessible and hence very attractive. M-learning is, however, still predominantly individualized and restrictive, though its influence is already felt all over the African landscape. The mobile technologies available in Africa are not the latest in mobile learning. The problem of a *Digital Divide* is, therefore, really between the technologically privileged and less privileged nations.

For mobile learning in Africa to meet up with global demands, the developed world should remove all constrains that can make access to new and latest mobile technologies a mirage and be ready to support Africa in order to bridge the ever widening *Digital Divide*, particularly in new mobile technology.

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Personalising learner support: revitalising the blend

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Abstract

Information and communication technologies play an important role in learner support at the United Kingdom Open University (OU). We use a case study to consider the recent development and further potential of ICT as part of a new model of blended learning support which has a much stronger emphasis on tailoring support to individual needs within the context of a subject area.

Introduction

This paper focuses on work within the Open University to offer greater personalisation of learner support using a variety of means including information and communication technologies (ICT) designed to individualise the provision of information, advice, and services to help students make informed decisions about planning a coherent study profile, and to facilitate learning and employability within the context of a subject pathway. This is work in progress and there is much still to do, but the direction is clear – away from an industrialised model and towards learner support which is '*tailored to the needs, strengths and weaknesses of individual students'* (Open University, 2004). Within the industrialised model, technology, mostly in the form of print and audio visual media, was used primarily to transmit academic content and what is most exciting about the new technology is the potential also to enable communication and networking.

The Open University context

The Open University created an initial blend of technologies to teach and support learners at a distance, consisting of printed course texts and audio-visual components including television, radio and audio-cassettes. Learners were supported through part-time tuition staff (now called associate lecturers) responsible for correspondence teaching and tuition including optional face to face tutorials, and by a network of academic and administrative staff based in 13 Regional Centres and at the University's headquarters in Milton Keynes.

This model operated from 1970 till the mid-1990s. Since then the introduction of ICT has led to step changes in teaching and learner support. The OU has not 'gone online', though there are some online courses, nor has it abandoned print or face to face tutorials, but the balance of the media mix has changed. The OU expects to incorporate ICT based teaching, student support and administration into all of its degree programmes and to interact online with almost all of its students.

Student engagement with technology has developed significantly over the last decade. Enquirers can choose courses, register and pay fees online. Registered students have

access to a home page containing personal details, their academic records, and links to library, careers and study support resources. They also have an electronic course desktop containing a study calendar, assessment information and course related materials. The course may include printed texts together with online resources and activities. Assignments can be submitted and marked online. Most students still have the option to attend face to face tutorials but tutorial support now frequently includes online conferences. And work continues to make more effective use of messaging systems, pod casting and mobile technologies.

An industrial model

Distance education has been likened to an industrial system (Peters, 1967, 1988) which is carefully planned, rationally organised, based on a division of labour, and broken down into specialised functions with products and services delivered to agreed and measurable quality standards. The Fordist analogy (Edwards, 1993) does have resonance for the OU. Specialised course teams produce high quality standardized teaching materials which, through economies of scale, are delivered on a cost-effective basis to large numbers of students (currently around 200,000 per year). The industrial model does have benefits and has helped to ensure good quality ratings.

In addition to heading the recently introduced UK National Student Survey of satisfaction with higher education for the first two years, learner support was highly commended by the 2004 Institutional Audit which identified academic guidance and support as an area of good practice which

> "*derived especially from the effective combination of the personal support provided by regional staff and the ALs (tutors) on the one hand, and the paper-based and on-line support on the other. There appeared to be little chance that an individual student or prospective student would not have access to appropriate sources of information, guidance and support"*
> (Quality Assurance Agency, 2004)

However the industrial model also has limitations. The sharp distinction between course production (the creation of the course teaching materials) and course presentation (study by students) results in an institutional separation of responsibilities. For example, the Student Services unit is responsible for generic induction, preparation and study skills resources which are produced independently of course teams who may also have developed their own materials.

Throughout higher education the term 'course' generally refers to the whole programme of study, such as an undergraduate degree, which has been designed and is taught, assessed and supported as a coherent entity. But in the OU industrial model, the academic product is broken down to its smallest component, the course module. This gives students maximum flexibility to construct their own study profile but the disadvantage is that there is no longitudinal view of the student. Organisational structures, systems and processes operate at the course rather than the subject or qualification level. Information in prospectuses concentrates on individual courses, students cannot register for a qualification, and teaching and learner support is geared to individual course modules. There is no oversight of student progress at the qualification level and no meaningful continuity of support throughout the student study career.

This model doesn't match the interests of the great majority of students. Students are treated as purchasers of individual modules which optionally can be accumulated towards a qualification. The paradox is that the curriculum is not developed as standalone modules, but as coherent academic programmes complying with UK higher education subject specifications and benchmarks. In addition, most students are oriented to study programmes which can lead to a qualification. In 2005, 77% of undergraduate students were linked to a qualification and surveys indicate that less than 10% are taking a one-off course module.

Personalised, Integrated Learning Support (PILS)

In 2004 a collaborative project was initiated by Student Services, the Social Sciences and Science faculties to help students make informed decisions about planning their study profile and to support learning and employability within the context of a subject area or programme of study and initially using chemistry and psychology to pilot activities which might then be mainstreamed. This was developed into a successful bid to the English Higher Education Funding Council to establish a Centre for Excellence in Teaching and Learning (CETL) in Personalised Integrated Learning Support (PILS).

Personalised
Personalisation is sometimes simply associated with personal contact primarily through face to face tutorials, but for the PILS team there is a broader focus on individualising a mass system. The aim is to tailor support to the needs of the individual student, taking a holistic view of the learning journey from enquiry to completion of study. Support will be more relevant if it is closely related to student objectives, how they're doing and where they're going. For PILS the subject/qualification provides the core around which a long term relationship and sense of membership and community can be developed.

Integrated
The PILS team brought together colleagues from different parts of the university – Faculties including staff designing new courses and associate lecturers teaching the courses, Student Services, Marketing, and the Institute of Educational Technology – working together in a new kind of integrated learner support team. The team would plan activities together, drawing on the range of knowledge and expertise in order to offer a more appropriate set of learner support services to students

Learning support
PILS has a particular focus on

- strengthening student identification with their chosen subject or programme of study and enabling students to make informed decisions about planning a coherent study profile.
- supporting success by enabling students to make best use of learner support resources, identifying and responding to signs of non-progress, and increasing the level of direct personal support.
- supporting employability by increasing awareness of the relationship between study and career development and enabling students to communicate their subject specific and transferable knowledge and skills to an employer.

A Revitalised Blend

The PILS team approach has seen the emergence of a new blend of people and technologies where the role of study advice is combined with the exploitation of ICT to open up fresh possibilities to support learning.

Revisiting the role of teaching staff
The PILS team has enhanced support aspects of the associate lecturer (part-time tutor) role. Recent research (Leach, 2007) shows that new students are worried beforehand about their academic capabilities but that in practice this was far less of an issue than getting to grips with a very different system of study and finding strategies to manage study alongside personal, work and other commitments. The team piloted several activities utilising the expertise of associate lecturers to support student learning and success.

- Progression Pilots. The aim was to test whether offering encouragement and discussion of progress at key points in the course by the student's tutor, would improve student retention and re-registration. Over 400 associate lecturers on the large population level 1 entry courses for Science and Social Sciences made additional contacts with their students, usually in the form of a telephone conversation covering an individuals' progress, their overall aims and plans for future study.

  > *"The students enjoyed the contact with them and appeared to be pleased about the interest shown in their continuing study." (Progression Pilot Associate Lecturer)*

- Programme Study Adviser Pilots. On selected level 2 chemistry and psychology course, experienced associate lecturers contacted students by telephone at three points - before the course starts, mid course and after course results are issued – and then continue to act as an educational adviser on the following course. The rationale is that students are served best by someone who understands the subject area and can build a longer term personal link.

  > *"Talking to students and hearing about their aspirations, as well as their concerns, is quite inspiring" (Psychology Programme Study Adviser)*

- Associate Lecturer Consultants. The PILS team supports 40 tutors a year for approximately 20 days each to undertake action research and development activities relating to teaching and learner support. A diverse range of projects have been carried out by the first two cohorts including e.g. how students use feedback on assignments, tutorial attendance and study skills. One topic of interest to many consultants is how to aid the transition to higher level study and this has led to various activities and materials being trialled with students. Some have been incorporated into the tutor's own teaching, and some may be developed as course resources or for the subject area generally.

  > *"I re-visited what I already 'knew' that 'teaching' (distance or face to face) and learning are not synonymous and got me to think very carefully about how best to support all students" (PILS Consultant)*

ICT enabled support

ICT forms part of a blended teaching and learning strategy. With over 90% of students now online, there is potential to create a networked university community which can reduce the isolation associated with open and distance education. Electronic media have been used in a number of ways for learner support in the context of subjects of study.

Online subject 'homes' have been developed which integrate the resources available for students. In February 2007, chemistry and psychology subject websites were launched to provide a one-stop shop for students with information about courses, qualifications and suggested study routes; department staff and their research interests; a notice board; study skills materials; professional recognition and careers resources and links to online conferences and external organisations. These subject homes aim to strengthen student identification with their subject area and offer a virtual equivalent to the building on campus where students can hang out during their studies. The subject homes are popular with over 20,000 first time visitors in the first three months:

> *"I found the website very informative, easy to understand and to navigate. I liked that it gave detailed information about the background and interests of the course team members. It gave useful information about which degree you should aim for, such as a BA or BSc. It gave me some ideas about which areas of psychology I would like to pursue when completing my degree. It also gave some information about further studies such as MSc and PhD. I also like reading the information about residential school, which has given me confidence to attend the residential school next year… This website will be useful to all students no matter what level you are at" (Psychology undergraduate student)*

The subject homes have also acted as test beds:

- video clips of students and associate lecturers at day schools and residential schools have been used to bring aspects of the teaching and student experience to life. Some students are anxious about residential school attendance and the direct student voice has helped to offer reassurance.
- audio-files/pod casts on a range of topics have been trialled. Audio files/pod casts are easy to make and the early results are encouraging. Interestingly the quick home-made files (using a basic microphone and free software) are as effective as costly professionally produced files.
- electronic newsletters were developed to welcome and engage students in the period between registration and course start.
- additional self-diagnostic and taster resources were developed for some modules to help enquirers and students get a clearer sense of the course and their own readiness.
- targeted emails offer timely and relevant prompts to students. An email at the end of the course reminding students about registering for their next course and linking into subject course choice information was successful, with 40% of those sent the email going on to register. This has been mainstreamed as part of a coherent university communications strategy.
- subject based careers conferences are heavily used. Students can post their query and receive expert advice from a careers specialist. More learner support conferences are now planned, including for course choice and study skills.

The approach is to pilot and use formative evaluation to gather intelligence for modification and refinement. Online conferences and pod casts/audio files can help foster subject identification and offer practical learner support and further exploration of pod casting with associate lecturers and piloting social networking software is planned. The concept of the subject home has generated interested among colleagues and several other subject areas will adopt or adapt the template.

…….. And Print
Print tends to be regarded as yesterday's media – but it is convenient, portable, easy to search and annotate and still highly valued by OU students (Crooks & Kirkwood, 2007). The team improved printed course choice information by developing subject focussed booklets for science and psychology offering a subject overview, information about recommended study routes, professional recognition and the types of career available. Students found the new booklets very helpful and the subject approach was mainstreamed for 2007.

Learner Support: a new balance

The key to learner support lies in recognising the interdependence of the learner support media and getting the right blend of people and resources. Print and web complement each other. Print provides an introduction and signpost without which students may never find what's available online. Students tend to use online study skills materials to dip in for quick study tips and request a printed booklet if they feel they need sustained help. ICT has a valuable learner support function, but it is also evident that personal support is essential. Support by a tutor or adviser figure watching over progress, having periodic conversations, discussing plans and options appears to be critical, particularly in the first year. It is also likely that tutor enthusiasm for ICT and reassurance to new students confronted by emails, websites, electronic assignment and conferencing systems helps to build confident student engagement. ICT has a valuable role as part of a blended learning approach which makes use of both people *and* new technology to integrate and personalise the student experience.

It is too early to claim that the PILS team has established a post-industrial model of learner support, but it has made some progress. It has demonstrated the benefits of a cross-department team pulling together academic and support staff and using the subject area as a focus for an integrated support strategy. It has successfully used people, print and ICT to support students more effectively.

Building subject communities for students and teaching staff is now a major objective and we believe that ICT can facilitate this. The online subject homes draw in students and conferencing, targeted communications, notice boards, video and pod casting help generate a sense of membership. The work to date has concentrated on gathering information and resources, and the challenge is to recognise and build on the social networking tools and processes used in the wider society enabled by mobile phones, email, blogging, chat/messaging systems and collaborative software. The use of these technologies for social networking is becoming commonplace and it is essential that the education sector explores how they can be best used to support dynamic educational communities.

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Gaming education versus violence - how gaming can save our students and Society

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Abstract

It seems that every time there is violence anywhere in the world in which the perpetuator of the violence has played a video game, the immediate conclusion is that it was playing violent video games that caused the perpetuator to act. At the same time that the gaming industry is under attack for the violence in its games, there are almost as many books and articles that dwell on the poor state of affairs in education.

Since video gaming is a well known motivator for those who play the game and education is in vital need of a learning approach that motivates its students, the gaming industry and the educational establishment should form a partnership to develop educational games that motivate students to learn something of value to society.

It is time for educators to reach out to politicians, business leaders and the gaming industry to develop the potential of gaming for making learning in our schools challenging, interactive, and addictive in a positive way. Society will benefit from the effort. Multimedia games with an educational focus will be demonstrated at the conference.

It seems that every time there is violence anywhere in the world in which the perpetuator of the violence has played a video game, the immediate conclusion drawn by Psychologists, Psychiatrists, Talk Show Hosts, Politicians, and others is that it was playing violent video games that caused the perpetuator to act. For every study that indicates that playing violent video games may lead to overt violence, there is a contravening study that indicates playing such games has no significant impact on the player's actions. At the same time that the gaming industry is under attack for the violence and sex implicit in its games, there are almost as many books and articles that dwell on the poor state of affairs in education.

Those who attack education in such a manner, such as Dr. Howard Gardner (2004), argue that students today are masters of facts but show little understanding of what the facts mean. Since gaming is a well known motivator for those who play the game and education is in vital need of a learning approach that motivates its students, it seems logical that the gaming industry and the educational establishment should form a partnership that motivates students to learn something other than how to shoot, race, or knock someone's head off. U.S. Senator Joe Lieberman already has made a proposal for just such a partnership. He stated (2001) that people in the gaming industry should reach out to the people in the education community and develop educational games to make learning more exciting and representative of the multimedia technology environment in which today's school children are going up.

Senator Lieberman has, over the past several years, been present at the annual review of the gaming industry's "Report Card" which assesses how well the gaming industry is doing in controlling the violence in video games. Parents, gaming industry executives and politicians are already engaged in a dialogue on how video games impact children from the early years through the teen years and beginning to realize and differentiate between games that are violence oriented and those that are education oriented.

The dialogue to move the gaming industry away from a focus on violence to one on education is only missing a vital group of advocates - the educators, both K-12 and the colleges/universities. Though some colleges, universities, and K-12 institutions are slowly beginning to support gaming, a campaign is needed to awaken all educators to the potential of video gaming to enhance our curricula with multimedia, interactive technology that could make the actual as well as the virtual schoolroom a place students will gladly go and enthusiastically learn in a manner that results in understanding and mastery of the subjects they "game". Educators, particularly those at the higher levels of education in colleges and universities, are not an easy group against which to launch a campaign. They have been told time and time again by computer and related technology education advocates that technology would be their saviour and rescue them from their unmotivated, discipline laden, poor performing students. Research studies to date appear to be inconclusive on just how much, if any, computers and technology have enhanced learning

One problem with the initial use of technology in the classroom was that it was given to teachers and professors without a stated, refined approach supported by learning theory that was presented with ready made technology rich curricula. Teachers did not have the time or skills (Beckwith, 2001) to change their overhead transparencies and text oriented lesson plans into multimedia lesson plans and presentations. In essence, they were given technology hardware but were expected to develop their own multimedia curricula - something they were, and still are, in most cases, without the time and expertise to do. Gaming addresses these issues up front, starting with learning theory which strongly supports a gaming approach to education.

Learning Theory and Gaming

The learning theory which best fits gaming is the *multiple intelligences,* an approach to learning developed by Dr. Howard Gardner (2004) of Harvard University. He postulates that there are at least five other intelligences by which we learn and not just the two intelligences of verbal and mathematical on which learning techniques have historically focused. Those intelligences are Bodily-Kinesthetic, Intrapersonal, Interpersonal, Musical, Spatial which, combined with Verbal and Mathematical, form a synergistic whole of how we learn as an individuals. A definition of most of these intelligences is relatively easy to discern but two of them may need some explanation. Regarding Bodily-Kinesthetic, Dickerson (1999) proposes that learning through gaming and technology is a highly active and interactive process when used appropriately. Students are able to interact with the gaming software and the computers which rely mostly on eye-hand coordination for their operation - a joy stick as well as the use of the mouse or touch-screen. This kinesthetic activity reinforces learning and makes the student an active participant in the learning process, not just an observer or listener as is normally the case in most traditional classrooms.

Popularity of Video Gaming

The popularity of video games is due to the physical challenges that the interactive experience and engagement that the player has with a multimedia virtual universe full of colorful graphics and strange new worlds that capture and hold the imagination. Games such as "Pong" and "Breakout" were among the first to demonstrate the appeal of this kind of technology. Later, Alexey Pajitnov, a Russian mathematician, researcher in artificial intelligence, and a member of the USSR Academy of Sciences, designed "Tetris" which was incorporated into Apple software. It provides for a quick testing of hypotheses for which fast decision-making and hand-eye coordination are essential. Students who might otherwise be bored in conventional math classes, even though they call for the same kind of spatial and logical thinking, are quickly and completely captured and engaged by these action-packed challenges.

Dickerson (1999) observed that Visual Spatial intelligence is second nature to today's students who have grown up watching television and are highly oriented to visual learning. Slides, overhead transparencies, filmstrips, movies, and now gaming are important additions to their learning. Students move from passive observers to active thinkers when interactive systems are also part of the learning process.

The Internet, with today's affordable high speed connections, has made gaming and multimedia technology (text, graphs, sound, motion, video, etc) display of information available at a click of a computer mouse and has opened the door to a tremendous educational potential for on-line classrooms. Unfortunately, as with on-ground classrooms, the potential for use of multimedia technology as a tool to enhance learning has not been met with widespread application and use. There is hope for there are gaming innovators and creators out there who are developing some remarkable games with non-violent, educational applications.

Non-Violent Gaming for Children with Cancer

David Warhol (Visher, 2006) developed *Re-Mission,* a 3-D shooting game set in a blood vessel. In this exceptionable educational game, the targets for attack are not the usual terrorists or six headed monsters but cancer cells. This game provides a glimpse of how gaming approaches could be used to address some of the problems and issues in society - in this case, cancer in children. The game was developed to support young cancer patients who can control Roxxi, a nanabot (a miniature robot) as it takes a trip through the body of a fictional cancer patient. The mission of Roxxi is to find and shoot cancer cells while applying methods of treatment. While this battle is going on, an invasion is about to take place by a bout of flu, so Roxxi must also ensure that the immune system stays healthy. Playing this game allows students to understand what is happening to them and learn more about their condition in the process. Warhol believes that the visualization of the game has a profound effect on how quickly and thoroughly children learn about their condition and this in-turn motivates them to take better care of themselves.

Non-Violent Gaming for the Classroom

In Tom Ryland's reading and writing class at Chew Magna Elementary School near the British City of Bristol, students sit mesmerized as he displays the dark walls of a hollow mountainside and uses his cordless mouse to guide the cursor down it (Visscher, 2006). He invites and challenges his students to write down which way they would to go to get to a ladder. They must describe what they would come across and experience on their

journey down the mountainside. He has found a way, using video games, to make writing fun for his students. Rylands, who possesses great computer and software skills, created *Myst*, which is a creatively designed series of computer games set on a mysterious deserted island. It can be endlessly navigated to inspire his students' innovation and creativity. The students (ages 9 to 11) in his classes have reached the 93 % mastery of the "level four literacy levels" in reading and writing over the four years in his program compared to an average of 73% prior to his program at the school and an average of 75% for all English children (Visscher, 2006).

Impact of Gaming on Education

Time magazine (2007) provided a very positive view of the impact of gaming on education. It noted that as children, much of our time is spent in imaginary worlds where we substitute toys and make-believe for the real world that we are just beginning to understand and explore. While we play, we also learn; and while we grow, our play becomes more complex as we add rules and goals, resulting in something similar to games.

Time (2007) also observes that an entire generation of children has grown up with a different set of games. They play these games in different ways and as you watch a kid with a new videogame, you'll find that the last thing he/she will do is read the manual. Instead, just start playing to see what happens. The magazine (2007) points out that this isn't a random process but rather the essence of the scientific method. Players build a model, through trial and error, of the underlying game based on empirical evidence collected through play. As the players begin to refine this model, they begin to understand and master the game world through a fast cycle of hypothesis, experiment, and analysis. Time points out that it's a fundamentally different take on problem-solving than the linear, read-the-manual-first approach of their parents.

Finally, Time (2007) postulates that in this time of structured education and standardized testing, gamers are learning in a totally new way which means they'll treat the world as a place for creation, not consumption. This is the true impact Time believes videogames will have on our culture.

A Gaming and Education Partnership

The Federation of American Scientists (Scientists, 2006), completing a year of research, has called for the Federal Government to begin research into determining how video games which have become so addictive for players can be converted into serious learning tools for schools. They think that video games can teach the skills that employers want and, by implication, the skills that schools should be teaching: analytical thinking, team building, multitasking, and problem solving under duress.

The federation president Henry Kelly (Scientists, 2006), believes that research is needed on which features of games are most essential for learning while, at the same time, assessing how to test students on what they learn in games. A good start, he believes, would be for the departments of education and labor to join with the National Science Foundation who could lead the way.

The Education Community and the Gaming Industry

In the past, the educational community has been slow to fund and utilize technology in classrooms and the same has been true with their embracing of the educational potential

of gaming. The lack of funding allocated by school administrators for technology is being followed by a lack of funding for gaming. And just as this lack of funding for technology was a disincentive for the technology vendors, it is also a disincentive for the gaming industry. It does not take a rocket scientist to realize that gaming companies who may billions each year designing and selling video games that focus on blood, guts, and sex are not going to design and attempt to market a product that schools will not buy.

Gaming and Training: the Military is a Model for Educators

It seems that educators have paid little attention to the U.S. Military who has for some time been a partner with the gaming industry and has used virtual reality and immersive visualization techniques characteristic of today's violent games to develop and produce high end military games to train pilots and tank operators and develop their skills in near real world pressure situations (Hannah, 2006). Parents and educators, who just don't believe that games can be or should be created to hone the various learning capabilities of their children and students, need to review the effectiveness of the military programs where young students and older students alike are trained/educated quite effectively and quickly using gaming techniques.

Millions of Young Students are Learning from Video Games: But What Are They Learning?

Sixty million American kids (92%), according to the National Institute on Media and Family, call themselves game players (Lieberman, 2001). The problem for society and educators is that most games are focused on subjects of war, sex, football, and worlds of fantasy unrelated to reality. Most games, even the violent ones, teach things that the educational establishment is having great difficulty teaching (Gardner, 2004): problem solving, critical thinking and understanding, but the setting of most games does not take place in the real world in which students live.

Conclusion

It is time for educators at all levels - pre-Kindergarten, Elementary, Middle School, High School, and Colleges to do their homework on the potential of gaming for addressing the problems of educating our children today and in the future. Many parents who, in the past would not spend $20 or $30 for a new book to read to their children or have the children read themselves, will spend $200 to $300 dollars or more for a video game console and $50 to $100 for each video game - without blinking an eye. But most regard the video game as an entertainment toy, and fail to recognize and consider its educational potential. Educators, after doing their homework, must show some leadership and model gaming as an educational tool in schools and convince parents that it has the same potential at home. The initial data and research on gaming programs oriented toward education show significant enhancements over conventional approaches.

It is also time for educators to reach out to politicians, business leaders and the gaming industry to develop the potential of gaming to make learning in our schools challenging, interactive, and addictive in a positive way. We can start at the college and university level in partnership with gaming companies to produce more educational games and then buy the games produced. As the research mounts and supports the existing but limited research that gaming programs that are designed for a specific educational

objective do enhance learning, the testing-focused educational administrators and associated politicians will jump on board. When they do, we will all - students, parents, educators, politicians, gamers, and society as whole - benefit from the effort. Not only will we produce more knowledgeable and capable citizens, but perhaps they, with their new found knowledge and capabilities, will save the world in danger of destruction and while exploring the universe to discover even greater worlds.

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Change processes initiated by the “e”: a case study

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Abstract

The paper describes a case study: the centre for continuing university education and distance learning of Hamburg University managed the e-learning project OLIM which was funded by the federal Ministry for Education and Research and the state government of Hamburg and ran from 2002 – 2004. The project comprised the development of a postgraduate e-learning programme of study as well as the preparation and training of e-authors and -teachers for the specific needs of e-learning. The paper considers medium- and long-term influences as well as unexpected changes initiated by this project. It focuses on the change in (e-)teaching competence, the change in teaching at traditional universities, in student support as well as product development of the institution.

Summary

The case study described focuses on unexpected and in the first place unintended but sustainable changes initiated by the e-learning project OLIM. This comparatively small project at Hamburg University funded by the federal Ministry for Education and Research and the state government of Hamburg ran from 2002 – 2004. It was one of the early funded e-learning projects in Hamburg when in parallel the state government started to set up a joint e-learning infrastructure and a competence centre for e-learning activities for the different universities in Hamburg. OLIM’s short- and long-term influence on the e-learning development at Hamburg University is evaluated in this paper. Following the project phase OLIM has meanwhile undergone a transition into a successful postgraduate programme of study and it still influences the universities’ e-learning activities.

Introduction

The centre for continuing university education and distance learning of Hamburg University (AWW) offers programmes in the area of

- traditional general university education
  (lecture series open to the public, a programme for senior citizens)
- special subject-specific postgraduate programmes continuously assessed and certified (art history, religious studies, management of conflicts, mathematics, China today…)
- and - based on co-operation contracts - the AWW is local contact point for students and enquirers for the German FernUniversität in Hagen and the Open University, UK.

The AWW is comparatively small for a university with about 40,000 students per year. There are five full-time and five part-time academics plus three part-time administrative

staff managing and running the above-mentioned programmes. In most cases these programmes were initially designed and jointly developed by the AWW and Hamburg University faculties. Hardly ever did this include distance learning teaching opportunities. Apart from a number of projects evaluating the opportunities of using existing distance learning material for traditional teaching, there has never been an intensive attempt to use these. The reasons for this were manifold but the main reason is the well-known one: traditional professors insist on their own design and structure of lectures and seminars. E-learning was the starting point for a change here.
At the early stage when the AWW was granted the funding for the e-learning project OLIM, the teaching staff at the university had no problem in admitting their lack of knowledge and competence in e-teaching and e-learning but saw the opportunity to benefit from the AWW's expertise in distance learning and to be among the early adopters.

Online Learning in Management (OLIM), a modularised postgraduate programme of study for young professionals aiming at managerial positions or updating their knowledge in certain areas, belongs to the second category of programmes mentioned above. The necessary flexibility for the target group in terms of time and place is realised by a blended learning concept. The programme development was funded by the German Federal Ministry for Education and Research and the state government of Hamburg from 2002 – September 2004. The programme comprises 12 modules, each running over a period of five months, and a compulsory preparation module "Virtual Teamwork" running over four weeks. OLIM covers general management, change management, knowledge management, project management, industrial psychology, organisational development and legal aspects of management. Since 2004, more than 300 students have registered for one or more modules, with about 60% students continuing to take more than one module.

Our e-learning concept is based on a learning arrangement which comprises virtual group work, discussion forums, marked assignments and continuous tutorial support. Reflecting on the development of OLIM we determined unintended and unexpected but most welcome influences within the university and, in particular, in the centre for continuing university education and distance learning.

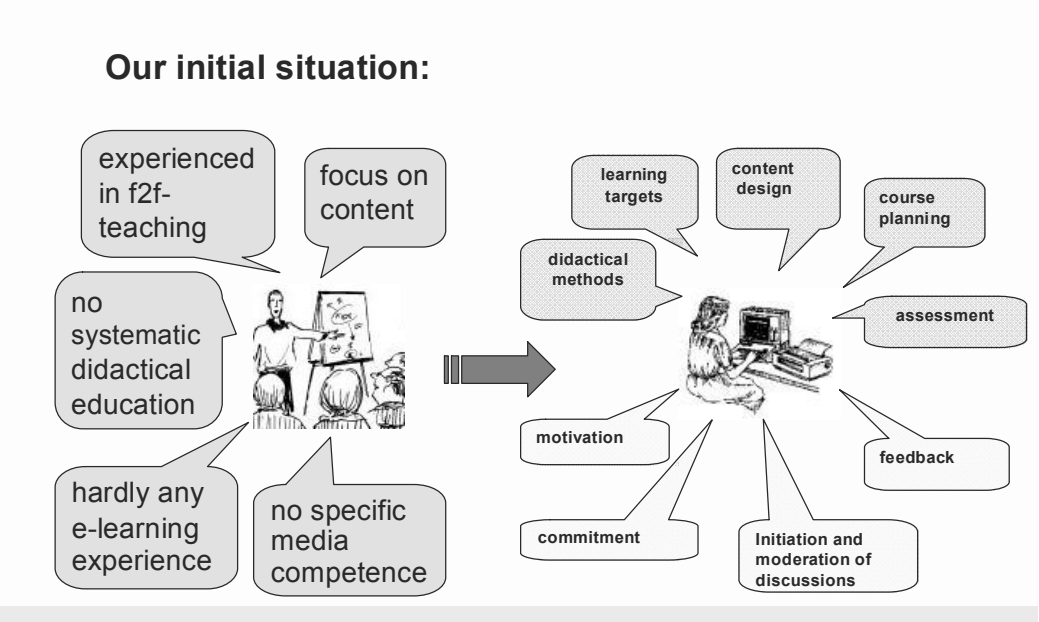
Change in e-teaching competence

The quality of teaching and the efficiency of learning are evidently not automatically improved by the use of computer and internet. However, the development and use of methodological and didactical e-learning concepts or a meaningful integration of multimedia learning modules in existing learning environments can certainly lead to the expected progress. With the appropriate didactic preparation, certain skills can be specifically enhanced using the new media. Study skills and problem-solving as well as negotiating skills are advanced by communication and group learning and by the interplay between work, learning and informing. The use of a learning platform that permits both synchronous and asynchronous work – also on shared documents – and communication, for instance in forums and chats, supports this goal.

All authors and teachers involved in the project were very experienced face-to-face lecturers. In order to prepare and train them for the specific needs of e-teaching, a three

months' module "Train the E-Trainer" was developed right at the beginning of the project.

All previous experience shows that competent support of internet-based learning processes and the supervision of the learners on the internet is an important, if not the most important, prerequisite for learning success in e-learning. Therefore, the development and testing of concepts for the further training of traditional lecturers as authors and moderators of e-learning modules is an indispensable component of any development planned for the area of e-learning.



The concept of "Train the E-Trainer" is based on self-experience: all future e-authors and e-moderators slip into the role of a student and experience the situation of a student and the importance of motivation and feedback. They learn how a moderator can reinforce the development of new ideas by carefully posing questions and introducing other activities. The role of moderators or facilitators rather than traditional teachers is a change in the way our traditional lecturers had seen themselves in the past. In addition to the subject expertise they realised that they need competences in order to motivate students, initiate and moderate discussions, and provide feedback on student performances. In the context of a virtual classroom they need to be competent to set up an atmosphere of acceptance in order to meet the needs of students.

Change in teaching at faculties at Hamburg University

Originally only targeting e-authors and e-moderators involved in the OLIM-project at Hamburg University, the course is now a stand-alone module addressing participants from any company, school, university, etc. who want to qualify for e-learning modules' moderation and/or development. Many lecturers as well as teachers from universities from all over Germany attend this course now. It does not only affect the "e-teaching" but also the traditional university teaching: "I haven't thought about didactics for years because I have been teaching for so long now and had thought I am an expert. Now I realise I have never really considered didactic systems or alternatives", is a typical testimonial we receive from our participants. Another typical one is: "When I am

planning and preparing my lectures or seminars now, I always start by fixing the learning targets."

The course has become one of the most important practical ways of approaching and adopting the "e" at Hamburg University. It is now part of the recommended e-qualifications for universities in Hamburg. Project members from faculties became promoters for the introduction of e-learning opportunities in their undergraduate programmes. The only part of the OLIM-concept which was not put into practice to the anticipated standard was the tutorial support – simply because of financial reasons. The faculties cannot afford to employ as many tutors as needed – not even for or because of the introduction of Bachelor and Masters programmes.

Changes in student support

The preparation of OLIM-students for the special needs of e-learning courses focuses on three areas: use of an e-learning platform, time management and virtual teamwork. Because of the mix of students (across academic and professional backgrounds, age, working experience, media-competence…), we cannot assume that they are well prepared for our concept of web based continuing university education. To meet these needs all students have to pass a compulsory course "Virtual Teamwork" in the first place. The topics covered are: getting familiar with the learning platform and its tools, time management issues, web based group work, web-related communication skills, reading and note-taking, basic knowledge of learning styles and their influence on efficient learning, individually and in groups. The didactic concept as in "Train the E-trainer" is based on doing and experimenting with the different tools, experiencing virtual teamwork and the reflection of these experiences. Although our target group consists of part-time postgraduates, in the beginning we always encounter students who act like students at school: passively waiting for the teacher to tell them what to do. It is the preparation module that is used to motivate and train them how to become active self-determined learners. The results become obvious when students move on to a follow-up OLIM-module.

Within these modules, different elements like case studies, role plays and the use of court records are realised and, according to internal and external experts' opinions, the results of the students' final presentations and assignments are of a significant higher standard than those of students from traditional continuing education programmes.

In addition to students' preparation, the learning experience and processes are supported by more than one moderator: after a period of testing we now set concepts into practice with three different moderators and roles per module for a group of about 20 – 25 students:

- One for subject specific issues
- One to observe, assess and feedback on the students' communication and work in teams
- One representing the business area providing feedback as a company representative

All three provide feedback to the student-teams from different perspectives, which is much appreciated by the students. It has, in fact, been proven to raise the quality of the students' performance. On the other hand, this situation also supports the moderators involved: they can discuss individual issues among themselves and provide feedback to

each other. The team of moderators can flexibly support the students' individual learning processes over a longer period.

The course "Virtual Teamwork" has also become a stand-alone by-product: big internationally performing companies face an increasing need to achieve results through working in virtual teams. In-house seminars using the company platform have been carried out with good results.

Change in product development in the AWW

Before e-learning was introduced, all AWW continuing university education programmes were developed by subject specialists only. The change towards e-learning went hand-in-hand with the introduction of content development by a team consisting of representatives of the subject, media-didactics, media-technology and commerce and industry. The need to agree on the content from these different perspectives was new to almost all parties involved but turned out to open up unforeseen and fresh ideas. Not to be responsible for the whole product as an individual took pressure away from them and opened the path to increased creativity.

These positive experiences led to changes in general product development: setting up teams with members who have different roles and expertise is now a standard procedure when planning a new programme.

Evaluation

A process of continuous evaluation is built into the modules in a similar way to traditional programmes. There is an anonymous online questionnaire for each module which the student is asked to fill in at the end. In addition to multiple choice questions regarding the quality of course material, the moderation and other aspects, there are open questions for the students to let us have their opinion. The summaries of these questionnaires build the basis for a joint reflection session with all moderators of a course. If necessary, adaptations to the course material are initiated and authors are involved. This applies to the moderation concept as well. Moreover there are fixed opportunities for the different module teams to exchange experiences and observations which lead to a higher readiness for change.

Conclusion

The success of the programme OLIM is based on the combination and interaction of didactic concepts, especially qualified moderators and students' preparation for the special needs of web-based learning and including a concept of continuous evaluation. In order to achieve best results on the students' side the moderators need to facilitate the students' individual learning process. In particular the latter can be seen as a change in the university teaching concepts of traditional universities in Germany. Feedback from our authors and moderators confirms that OLIM initiated a change in their thinking and planning for traditional lectures and seminars. They no longer regard didactics and facilitation as something separate from the subject content. The integrated approach opened their eyes and their thinking so as to improve the quality of their teaching and to put the individual student into the centre of their teaching. The drawback for our University is the lack of necessary government funding and human resources to further

develop this high quality education or at least to provide a similar standard for students in undergraduate programmes.

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Using new technologies to enhance learning and teaching by creating online worldwide research opportunities through synchronous (real-time) connections

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Abstract

This paper supported the notion postulated by Thomas Freeman that the world is truly flat and getting smaller. Technology has made instant communication a reality more so now than any other time in our history. Those interested in research and applying the best practices in teaching to our classrooms and businesses are now able to utilize the internet in ways that can save time, energy, and money. The authors focused on various platforms that can bring researchers together in real time to share ideas and collaborate from all parts of the world. Selected best practices from various disciplines were outlined as examples of how educators can bring about positive change and focus on cutting-edge techniques for classroom and business applications. From the use of gaming in the classroom or the analysis of a business or corporation, to the use of bringing experts to students, university professors, managers and chief executive officers via the internet were discussed.

Background

Education without boundaries continues to become more of a reality with each passing day. At the core of this reality is technology. Faster and smaller devices have evolved from the telephone to the radio, television, and most recently, the computer, cell phones, and iPods. Variations on these devices have made expanding the boundaries of the traditional classroom a must for students wishing to gain an edge in this world of global competition. Thomas L. Friedman, author of *The World Is Flat* contends that it is now possible for people to collaborate and compete in real time with other people on more different kinds of work from various corners of the world using new, state-of-the-art technology and creative software (Friedman, 2005). Opportunities now exist that were not even imagined decades ago. Futurists and science fiction writers have only touched on the realities that have leapfrogged on existing inventories for improved communication. Today's technologies make it possible for teachers and others to join communities of people well beyond their schoolhouse doors. Over 150 colleges require students to buy computers as a way to make sure everyone has ready access to the Internet and other classroom applications (Carnevale and Young, 2006). With synchronous and asynchronous conferencing, teachers and students can join with varied communities (New London Group, 1996). The ideas shaping our future come from all quarters including the military, NASA, NASCAR, auto, computer, and the entertainment industries. Communities of business people and others who are remotely

located or geographically close continue to share a common interest through the use of the computer (Nathwani and Diduca, 2002).

The iLinc and Other Multimedia Distance Technologies

Computer technology now offers iLinc and other platforms such as office.com and skype.com along with Blackboard and eCollege, providing the capability of communicating on three levels of media: audio, visual or text messaging. New vistas are now open to not only students and teachers, but can and do include the business community, partnerships with professors, university classes, and the public at large.

Professors at National University based in La Jolla, California, have embarked on using this technology not only to augment their teaching onsite as well as online, but have taught entire classes exclusively via iLinc. Staff continues to use the synchronicity of the medium to conduct real-time individual and small group departmental and school meetings. An article in *Performance Improvement* by Sharon L. Gander stated that there is a demand for an improved communication tool that can enhance performance and decrease time to competency (Gander, 2006). Additionally, in light of threats to student safety with unpredicted school violence, online programs are helping to provide these benefits and securities. Pilot programs are underway to connect professors with online staff development both nationally and internationally. Currently, National University has Memoranda of Agreements (MOA) with Universities in Nayarit, Mexico, and agreements in principle with Queens University in Belfast, Northern Ireland, for online visiting professor programs. Other universities have expressed interest in collaborating through technology.

Professors have used this methodology in their classrooms as well as with colleagues across the globe. Together with a team of cross-departmental professors, they have demonstrated the potential for multi-department collaboration using iLinc as the communication hub for both synchronous and asynchronous online programs.

Other universities are creating “cross global” classrooms. In 2000, a MOA was signed between the University of Calgary, Canada, and Deakin University, Australia. Some of these courses were hybrids of online and three-week, face-to-face meetings (Wiesenberg and Stacey, 2005).

Advantages to iLinc and Other Technologies

There are advantages and disadvantages to using iLinc and other technologies such as office.com, skype.com, WebEx.com, GotoMeetings.com or other popular programs such as Blackboard or eCollege. On the plus side, it allows synchronicity and potential, frequent interaction between students and their instructor as well as student dialogue with other students publicly and privately. The voice-over internet protocol (IP) platform allows the participants to see the picture or video of the person who has “The Floor.” One can also see the names of all the participants in the session, the agenda feedback palette, and the text messages section. On the right hand side of the screen, the participants can observe a white board or “power board” where the person or leader in charge can import, draw or write almost anything to compliment the lecture or content material. The instructor or leader can easily add PowerPoint presentations to the agenda either before or during the session, although it is recommended to do it in advance.

Another useful feature of iLinc is the "application sharing", which allows the session leader to share a file or program in his/her computer, so everyone can view the presentation. Exploring and navigating a website is an additional advantage for enriching many courses and sessions.

The iLinc 8.5 program is licensed software that students can download from the Internet, once they are invited to a session. The sender of the invitation has to pay a license fee for each participant. In iLinc, there are three modalities: meeting, conference, and classLinc. The conditions and characteristics vary depending on the selected modality.

The iLinc 8.5 program and other products known as "groupware" are excellent tools to complement a class or business meeting, for example, substituting text chats for both online and onsite programs can lead to a much higher degree of interaction and participation. Students and administrators have reported that iLinc sessions are far more exciting than small discussion box text messaging on traditional online programs. National University utilizes iLinc for many online classes and chat rooms, which have the Blackboard or eCollege platform.

For an initial minimum investment of a headset, microphone, and webcam, anyone with a computer and a dial-up connection can convert to iLinc via their email. The recipient is sent an invitation on his/her email by the sender and can access the system from his/her home, school, or office. For large group audiences, images can be projected on larger screens, providing theater-like environments.

Other advantages include the cost savings of non-travel, avoiding travel fares, lodging, and food while, at the same time, maintaining a safe environment. Additionally, research has shown that a student observing direct eye contact and the non-verbals of a real-time professor with interaction enhances their learning. The application of this knowledge has resulted in the development of a hybrid course model requiring a percentage of the content be delivered online with students working in the classroom and teachers helping students learn at their own pace (Oblender, 2002).

Traditional online courses have several disadvantages that are avoided when using iLinc and other real time, synchronous groupware. Gordon Smith and others in their article in the *International Journal of Instructional Media* point out that "Because of the reliance on text-based communication and the lack of visual cues, every aspect of the course (online) has to be laid out explicitly in meticulous detail to avoid misunderstandings." Online instructors have stated that they cannot use their presence (online) and their classroom skills to get their point across, nor can they use their oral skills (online) (Smith, Ferguson, Caris, 2002). The iLinc and other video formatted programs address those issues.

Disadvantages to iLinc and Other Technologies

Disadvantages include time zones, translation issues, and technology capabilities. An iLinc program can be used globally, increasing the need for time-zone awareness. Global connections may need translators, who need to be technically trained. This may necessitate longer session times than anticipated. Incompatibilities with MAC computers have been experienced, but a new version due for release in the summer of

2007 promises to fix these issues. Bandwidth restrictions may limit the number of clear direct connections, and test runs prior to formal meetings are advisable. High-speed internet works best with the system. Some students and institutions may not have this capability.

The absence of a teacher and not having the "social presence" of other students may lead to decreased motivation and involvement (Hiltz, 1998). Rosabeth Kanter agrees with Hiltz, contending that social isolation occurs even when the Internet is used for communication, if it is used alone. This on-screen dialogue lacks the richness of face-to-face communication. She says this inhibits the development of children's (and adults') intellectual and social skills (Kanter, 2001). This paradigm change from traditional teaching or conferencing can cause tension between the traditionalists and those embarking on new technologies. Online learning and conferencing will have profound effects on who learns, who teaches, and where teaching and learning take place (Glahn and Gen, 2002).

The playing field has been levelled. Technology users have been facilitating this levelling of information transmission for people to collaborate as well as compete in real time with other people in different kinds of work from outlying corners of the world and on a more equal footing than at any previous time in the history of the world (Friedman, 2005). Email, teleconferencing, iLinc, and other dynamic new software and teaching/learning platforms have emerged on the world market to make all this possible. WebEx.com, GotoMeeting.com, and Office.com are integrated suites of applications that are accessed around the clock worldwide. New terms seemed to be coined daily such as groupware, iLinc, application sharing virtual meetings, e-learning, PDA, blackberry, text message, ipods and asynchronization. They are now a everyday part of the new age vocabulary. Text messagers alone have their own vocabulary and shorthand creating a lexicon of new acronyms such as "gal" get a life, and "lol" lots of love or luck, or laugh out load, "brb" or "brt" for be right back or be right there and a very popular "pos" for parent over shoulder, etc. Demonstrations are readily available to show how easy it is to connect to knowledge centers around the world in order to exchange information, particularly for researchers at the university level. Groupware is now offered by one such program which has been the development of online academic research exchange programs.

Online Research Exchange Programs

Online research exchange programs allow universities and businesses to reach out to their members in the system and expand their influence nationally and internationally. By developing partnerships with other universities and businesses with similar educational philosophies and capabilities, business people, professors and students will be able to share best practices to the adult learner in the areas of business opportunities, teaching, scholarship, and service. National University's mission states in part:

> "…Its aim is to facilitate educational access and academic excellence through exceptional management of University operations and resources, innovative delivery systems and student services, and relevant programs that are learner-centered, success-oriented and responsive to technology…"

Their International Academic Exchange Program (IAEP) supports this philosophy and will seek other universities that foster these beliefs.

The costs are minimal and the returns are great. By starting with an international visiting professor concept that offers opportunities for global collaboration in research and improved classroom teaching techniques by way of iLinc, real-time video, audio, and text messaging via online technology, we can fully utilize our existing manpower and equipment. The IAEP program fits well into the philosophy and mission of National University by offering a low-cost, high-return program using existing resources of our advanced technology and high quality instructors.

In a recent report in the *Chronicle of Higher Education* and reported by Karen Frankolo in *Workforce Magazine*, institutions are seeing dropout rates that range from 20 to 50 percent for distance learners. Administrators of online courses concur that dropout rates are often 10 to 20 percentage points higher than in their face-to-face counterparts (Workforce). Getting more personal through chat rooms and iLinc connections will tend to reduce these numbers.

Net-based training has attracted businesses as well as universities. Xerox trainers state that internet-based lessons are rapidly overshadowing traditional manuals, memos, and face-to-face corporate classrooms. Early complaints of online instruction were that classes were too stilted, with a self-paced script, and with little true interaction between an instructor and student. iLinc and other online programs serve to bridge the gap with more live instruction and interactivity (*The Washington Post*).

National University has developed a close relationship with the San Diego County Office of Education in working with their television network. The Department of Media and Communications is working with Channel 16 as an important resource. The International Academic Exchange Program is yet another avenue of communication as globalization and new emerging technologies provide a substantive opportunity for faculty, students, and university administrators worldwide.

Benefits of an academic exchange program

All schools and departments can benefit from this type of program by reaching out to student bodies around the world. Certificates of completion in areas of organizational leadership, teaching and administration, as well as other advanced degrees, can become a natural evolution of this outreach endeavour. Professors can interact on research and publishing projects as well as network in the sharing of data and special programs or services.

Bill Gates, Microsoft's chairman, says he sees many technology-driven changes ahead for higher education, including the end of printed textbooks in favor of electronic ones. He sees university professors having the ability to take the curriculum they want and assemble it in a rich way and have it be interactive. Over the next five to ten years, Mr. Gates sees computers being reduced to the size of a wireless tablet thus reducing costs and increasing convenience (*Chronicle of Higher Education* p. 25, August 5, 2005). International visiting professors will now be able to present their "best practices" in their own way without using a classroom textbook.

Best Practices

Instructors using distance video conferencing have discovered a number of best practices with using this medium, which are the topic for another paper. One key factor is the notification to recipients that the meeting or class will be an iLinc, Web Ex, office.com, or Go to Meeting format. All involved must be familiar with the selected platform. Technical support must be readily available, along with knowledge of the capacity in a DSL or dial up modality for the participants. Asking for feedback on a regular basis will add to the function of each meeting. Specific break time must be decided and maintaining communication with the group during these times will be appreciated by the members.

Vendors such as Logitech, Creative, and others have created products for the children's and adult markets including products for the therapeutic, medical and handicapped markets. Hardware is now available including ergonomic enhancements, video cameras, speakers, remote mouse controls, projectors and microphones at reasonable prices. The use of wheels and joy sticks has opened the door to the use of gaming in the classroom as well as training for the military.

Business applications are endless. Corporations have found video conferencing to be very cost effective. People are communicating and sharing information and conducting business analysis from the medical profession to aerospace companies. Data driven decision making is faster and much more economical, resulting in cost avoidance as well as cost savings.

Program Design

The International Academic Exchange Program started with an online visiting professor program designed to develop a partnership with international universities and National University. The program created a dialogue within the various schools or colleges and shared best practices that added to the variety and rigor, thus expanding the scope of future programs offered at participating universities.

In addition to staff development, professors have augmented their classes via iLinc and online text messaging during regular class sessions. These methods have been used at National University and have added to "best practices" being utilized in the classroom environment. Instructors have partnered with other university professors from sister institutions to bring in an added dimension with their guest speakers. Professors have linked their online classes with on-ground classes of like content for face-to-face chat sessions. Any platform can be used; however, enhancements are most effective with the support of the Media and Communications departments.

The future is rapidly approaching as technology advances at geometric proportions. Professors and administrators can be iLinced at department meetings, symposiums, professional conferences, and small group or individual meetings. This has opened the door to scholarship (publishing) collaboration nationally and internationally, leading to publication in journals such as the *Phi Delta Kappan* international journal, and the *Journal for the International Council for Innovation in Higher Education.*

Cyber introductions have lead to face-to-face meetings at subsequent international conferences and actual live professor and business professional exchanges.

Conclusion

Distance learning has made its mark on creating education without boundaries. Express mail, radio and television have extensive histories, but new technologies such as the reported computer enhancements with new software and networking make it much easier for educators to conquer space and time. We can now bring learning to virtually any place on earth anytime. The implications of online, iLinc and other technologies are extensive and are being recounted in journals, newspapers, and books every day. Neil Rudenstine (1997) former president of Harvard University, noted that the Internet and other electronic networks allow communication to take place at all hours and across distances, extending the scope of instructional interaction (Picciano, 2006).

Once the logistical problems are solved, especially the technology, time, and translation issues, the process of implementing the use of this groupware technology can begin at any level; however, these technological advances create tension between what traditional educational systems offer and what new online teaching methods can offer. There is a gulf, according to Glahn and Gen, separating the tasks of traditional teachers and students from those using new technology (this can be true of corporate management as well) (Glahn and Gen, 2002). Partnering within departments has proven to be a direct and rapid method for communication. Opportunities now exist to cross department lines for sharing internal university procedures, including dossier development, new faculty orientation or new curriculum and best practices.

Partnerships can now expand to new arenas. Media can reach all corners of the globe including businesses and universities alike. Information sharing through interactive technology can bring best practices of any profession or trade to entities with just one keystroke.

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The new social networking technologies: educators get a Second Life

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Introduction

This paper provides a broad overview of social networking technologies with a focus on the Multi-User Virtual Environment (MUVE) Second Life. Second Life is an online MUVE (created by the private company Linden Labs) that is gaining in popularity among educators and is unique in the world of online games in that it has no predetermined plot. Participants in this online world create avatars, or virtual representations of themselves, and can then buy and sell virtual land, start virtual businesses, attend or teach virtual classes, create objects and participate in activities which are limited in many ways only to their imagination.

Second Life Population May 31, 2007	
Residents Logged-In During Last 7 Days	464,256
Residents Logged-In During Last 14 Days	685,116
Residents Logged-In During Last 30 Days	1,096,954
Residents Logged-In During Last 60 Days	1,758,150
Total Residents	6,888,765

This paper also briefly examines who the users of these technologies are and it discusses some of the issues surrounding the use of Second Life along with some of the other online social networking technologies.

Hype and Opportunity - The New World Wide Web

With the emergence of the so-called Web 2.0 online social networking technologies, educators are scrambling to understand what it all means. Of course, aside from the educational applications of the technologies, it presents an excellent economic opportunity for technology specialists, technology companies, authors and consultants. The term "Web 2.0" was coined by Tim O'Reilly and colleagues in 2001, and since 2002, the number of web hits on "Web 2.0" has risen from 9.5 million (O'Reilly, 2005) to 127 million (according to my own Google search) in April 2007. A web site Google search in May 2007 of "What is Web 2.0" produced 352,000 hits, and when blogs are targeted, the same search terms produced 4,865 hits. O'Reilly (2005) notes that "there's still a huge amount of disagreement about just what Web 2.0 means, with some people decrying it as a meaningless marketing buzzword, and others accepting it as the new conventional wisdom." Others, like Ian Davis (2005) argue that the Web 2.0 label "is cunning: semantically it links us back to that original web and the ideals it championed, but at the same time it implies regeneration with a new version. Technology has moved on and it's important that the social face of the web keeps pace." He argues that "Web 2.0 is an attitude not a technology. It's about enabling and encouraging participation through open applications and services" (Davis, 2005).

The term "Education 2.0" is also being used when referring to educational uses of these technologies. A Google search on this term produced 137,000,000 hits in May 2007.

What are the technologies?

Social networking technologies most associated with education include blogs, wikis, RSS, podcasts and vlogs, among others. Within the context of this paper, it is not possible to examine individual technologies, but the reader can find a rich list of resources by searching the internet or by visiting the following sites:

- http://www.allthingsweb2.com/,
- http://virtualkarma.blogspot.com/2006/01/complete-list-of-web-20-applications.html
- http://www.listible.com/list/complete-list-of-web-2-0-products-and-services

O'Reilly and Associates (2005) described Web 2.0 as a platform where users control their own data including:

- Services, not packaged software
- Architecture of participation
- Cost-effective scalability
- Remixable data source an data transformations
- Software above the level of a single device
- Harnessing collective intelligence

A New Generation of Users

Educators, technology workers, business people and others are spending money to travel great distances to attend conferences and to buy new products in order to learn about and to discuss the implications of Web 2.0 and attendees at these events may also soon find themselves wondering if they are "Digital Natives" or "Digital Immigrants" (Prensky, 2001) or if they belong to the group of "Bridges," "The Undecided" or even the "Refugees" (Fryer, 2006). They will most likely hear warnings similar to this: "the single biggest problem facing education today is that *our Digital Immigrant instructors, who speak an outdated language (that of the pre-digital age), are struggling to teach a population that speaks an entirely new language"* (Prensky, 2001, p.2). According to Prensky "*Our students have changed radically. Today's students are no longer the people our educational system was designed to teach*" (p.1). These students are the "Digital Natives," the kindergarten through university age students who "represent the first generations to grow up with this new technology" (p. 1). The "Digital Immigrants" have "their foot in the past" and are adapting to the new environment" – they think differently than the Digital Natives, who "think and process information fundamentally differently than their predecessors" (p. 1).

Additionally, Prensky (2001) cautions that methodology has to be reconsidered and that "Today's teachers have to learn to communicate in the language and style of their students. This doesn't mean changing the meaning of what is important, or of good thinking skills. But it does mean going faster, less step-by-step, more in parallel, with more random access, among other things" (p. 4). I agree with Prensky when he says that teachers must learn to communicate with students, but the argument for communicating

in the language of one's students is not new. I would also agree that *in some contexts*, (but certainly not all) a faster pace is appropriate and additionally, Prensky would probably find few who would argue that creative approaches to teaching (rather than a linear process), including the use of games, have potential to bring positive results.

Using games is a good idea but it is not a new idea to education. As early as 1916, John Dewey (1985, p. 202) discussed the practical and positive use of games in education and asserted that the "Study of mental life has made evident the fundamental worth of native tendencies to explore, to manipulate tools and materials, to construct, to give expression to joyous emotions, etc."

Additionally, not all people who attend school between kindergarten age and college age have experienced similar exposure to technology – not to mention the fact that 250 million children in the world will not receive a basic education and over 100 million will receive no education at all (UNESCO, 2006) - and so the term "Digital Natives" cannot possibly apply to an entire generation as Prensky suggests. There is still a digital divide. Even if we only focus on those who have been exposed to technology, to suggest that all of the digital natives of this particular generation think the same or have the same learning styles is, to put it mildly, arguable.

Jenkins et al. (2006) refer to the new generation of users of the new technologies as the *Participatory Culture* and suggest a shift of "focus … to those of opportunities to participate and to develop the cultural competencies and social skills needed for full involvement" because the new literacies almost all involve social skills developed through collaboration and networking. These skills build on the foundation of traditional literacy, research skills, technical skills, and critical analysis skills taught in the classroom" (Jenkins et al., 2006, p. 4).

But as we consider how to serve the next generation of students, educators should heed Dewey's (1998a) advice when he reminds us of the sound psychology in the adage "stop and think" when it comes to our approach to educational technology choices. "It matters what tools are available to a culture, but it matters more what that culture chooses to do with those tools" (Jenkins et. al., 2006, p. 4).

Interaction, Participation, and Dialogue

The terms "interaction and participation" are often mentioned in discussions of the new social networking technologies. The word 'social' implies *interaction and participation* in a community. It is important to remember, however, that "Interaction is not always constructive" but dialogue, according to Moore (2007), is constructive – it is an exchange that "builds upon comments of the other" (p. 92). Burbules (1993) devotes a chapter to *Playing the Dialogue Game* and reminds us that dialogue has "the capacity to completely involve us as participants" within the "ongoing logic of a discussion, the enthusiasm of discovery, the excitement of vigorous disagreement… to the point that we are unable to say whether we are steering or being steered by the course of the discussion" (p. 60). My point here is that the users of these new technologies may be adept at using these technologies, but it is up to educators to use the technologies in a way that provides a framework which addresses course objectives and provides a quality educative experience within a distance environment. Dialogue "happens after a course is designed, within the environment determined by the course structure" and

"teaching and learning in separate locations is better understood not as an aberration of the classroom, but as a significantly different pedagogical domain" (Moore, 2007, p. 90). Moore (2006), in his discussion of dialogue, states that "if understanding dialogue is an essential foundation for good teaching in the classroom, surely it is even more vital for teaching across distance through technologically mediated communication" (p. 123).

Interaction and participation are components of a social experience, but in education, dialogue is key – and in an asynchronous distance environment, dialogue can be even richer because participants have the opportunity for more reflection than in most face-to-face environments. Saba (2007), in a discussion of a distance education theory building and Moore's Theory of Transactional Distance, makes the excellent point that "if students and teachers are separated by the total absence of dialogue, as occurs in many classrooms across the country and around the world, bringing them together until they stand nose to nose will not offer a solution" (p. 17). In the same sense, in a virtual world like Second Life, avatars standing virtual-nose to virtual-nose will not offer a solution in the absence of dialogue either.

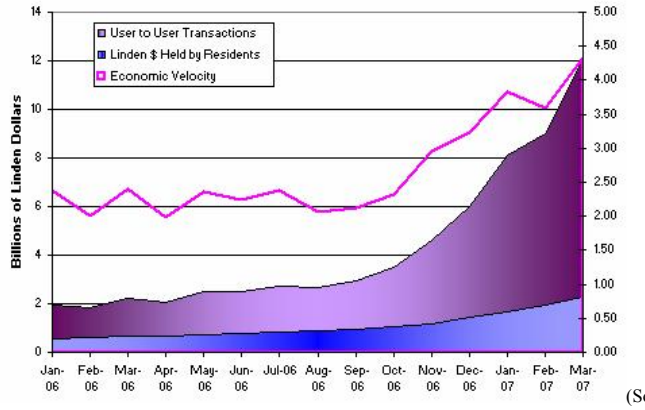
One advantage that online discussions have over face to face discussions is that some of the social networking technologies provide us with both asynchronous and synchronous options. In the past, text based discussions have dominated the learning landscape, but there are even new audio based technologies, like YackPack (http://www.yackpack.com/) that allow users to carry on synchronous and asynchronous online oral discussions on a web site or blog.

Other Issues

Privacy issues warrant some discussion. While it is possible to protect one's privacy when using the social networking tools such as blogs, wikis, and even Second Life, educators should understand how to provide privacy when it is appropriate, and to make sure that students understand and take privacy issues into account. Stories appear in the press about students being turned down for jobs after questionable posts on networking sites like FaceBook and MySpace. Female bloggers are also more susceptible to threats and harassment and this issue has even caused a dramatic drop in female participation online (Washington Post, 2007). In addition, low quality work that is posted in a public space could also open up students, educators, and organizations to future criticism and associated vulnerabilities.

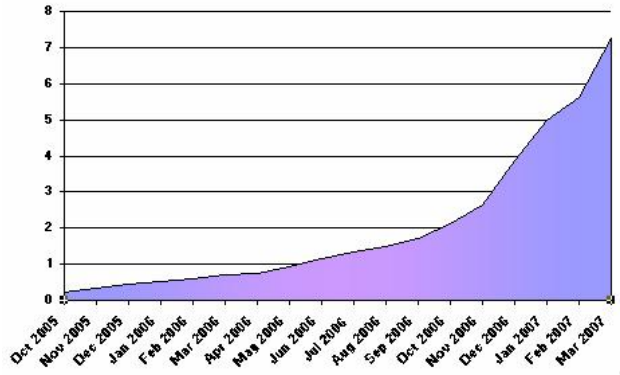
Spillover into the real world (or *First Life* as it is referred to by users in Second Life) from virtual worlds is also a concern in Second Life. "Traditional problems of human nature and conflict persist. Participants in virtual worlds may misunderstand each other. Others may intentionally lie, deceive, or cheat. Conflicts in a virtual world may arise when two participants have agreed on a contract, and one of them fails to perform" (Mayer-Schonberger & Crowley, pp1790-1791). For example, in Second Life, there is an economy where objects that are created by participants are bought and sold with in-world currency called *Linden Dollars*, and these dollars can be exchanged for US Dollars, so there is potential for Second Life residents to make a living in the Real World through their participation in Second Life.

Economic Activity



(Source: Second Life, 2007)

US $ Exchanged on Lindex* (in Millions)



(Source: Second Life, 2007)
*Lindex is the official Linden dollar exchange

Linden Labs also "combines the right of its participants to freely trade virtual objects with the right to retain intellectual property ("IP") rights over those same virtual objects" and "these real-world rights can be violated by other participants who copy, use or disseminate this IP without permission. Participants may also violate other rights protected by statute, like trademark or patent laws." Users must also be aware that communication torts and other laws that societies impose may be applicable. Because Second Life has no plot, users are free, just as in the real world, to partake in activities that may be against the law (Mayer-Schonberger & Crowley, pp1790-1791). For example, there is currently gambling taking place in many locations in Second Life. "Most lawyers agree that placing bets with Linden dollars violates U.S. anti-gambling statutes, which require that "something of value" be wagered. But the degree of Linden Lab's responsibility, and the likelihood of a crackdown by law enforcement officials, is far from certain" (Reuters, A., 2007).

One other recent development at Second Life is that Linden Labs plans to introduce a system which will "verify the age and country of residence of its users amid a series of inquiries into pornography and gambling in the virtual world. Under the plan, residents will be required to flag land as "adult" if it contains content that is "overtly, graphically, or explicitly sexual in nature or intensely violent" (Reuters, E., 2007).
Second Life does provide educational organizations discounted rates for private land which allows educators to have much greater control over the virtual environment, and many institutions are taking setting up virtual campuses.

Education in Second Life

As of June 2007, 129 traditional brick and mortar colleges and universities (Second Life wiki, 2007) had established a presence in Second Life. During a two week period in May 2007, 227 educational events were listed on the activity board, and 97 user groups which were categorized under the heading of "Education" were listed. The group with the most members (almost 1400) was "Real Life Education in Second Life" followed by "Educational Podcasting" (over 650 members).

Returning to a discussion of the use of Second Life in the classroom, I suggest that a division of labour and a collaborative approach will be most effective for educators who want to get started in Second Life. Just learning to work initially with an individual avatar involves a steep learning curve and if one must also create all of the essential objects inside of the virtual world, the task could be daunting, even for someone who is technically savvy. Cross-discipline collaboration would allow for a higher quality and more efficient educational experience for both student and teacher. Many teachers wear several hats: content provider, course designer, communicator, and student-customer service provider; under these circumstances, it is difficult enough for teachers to be successful in meeting the needs of their students, but add the design and delivery of a course using unfamiliar and under researched technologies into the ingredients, and the recipe for a good learning experience may be spoiled. And it is not only the student-as-guinea-pig that potentially loses when this happens: it is also the teacher, the academy, and ultimately, society.

The successful mega-universities of the world employ a course team approach, and this may be a challenge for many, as "the idea of teamwork in teaching outside the mega-university context is not widespread in university practice, even though many universities may purport to support the ideals of teamwork. … However, the course team is one of the critical success factors of the open universities. … The innovation associated with proper implementation of the scholarship of course-team development has meant that the mega-university is capable of better-quality teaching than conventional universities on both academic and pedagogical grounds" (Daniel, Mackintosh & Diehl, 2007, p. 612).

Conclusion

While it is clear that these social networking technologies and MUVEs hold great potential for uses in education, it is also clear that, as briefly discussed above, they have real world implications and that they are also not "one size fits all." We should continue to enthusiastically explore, and to thoroughly research the opportunities that new technologies provide so that we can provide high quality educational experiences for our students but, as educators, it is also our responsibility to make sure that we do not allow the freedom to use these technologies to turn into something negative and that in our enthusiasm (and whatever our motivation is) to use these technologies, we remember that "[i]mpulses and desires that are not ordered by intelligence are under the control of accidental circumstances" (Dewey, 1998b, p. 75). As Dewey (1998b, p. 76) reminds us, "A person whose conduct is controlled in this way has at most only the illusion of freedom. Actually he is directed by forces over which he has no command."

The future of education is exciting. We now have new (virtual) worlds to explore - and our work in Second Life, if approached carefully and implemented in ways that provide quality educational experiences, has the potential to positively affect the quality of our First Life in ways we are only now beginning to imagine and discover.

[Appendix 1 provides some additional thoughts for an educator who is thinking about using Second Life for educational purposes.

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Appendix 1: Things to Consider in Thinking about the use of Second Life

- Research –familiarizing oneself with the virtual environment. Familiarizing oneself with the environment means understanding the entire process – from login to creation of an avatar to technological infrastructure:
    - SL account creation and login
    - Avatar creation
    - Avatar basic navigation
- Environment – where will the students meet or where will the learning take place? Does your organization have existing land? Do you need to buy land? Do you need to create a learning space? If so, who will create the learning space? Will you allow students to conduct class work in areas other than those that you designate?
- Who will create the course content? How will that content be presented in Second Life?
- How will students communicate? Will it be asynchronous or synchronous? Are all of the students in the same time zone, for example, and able to meet synchronously? Text only using the Chat and IM functions? Skype? In a few months, audio will be available inside Second Life, allowing synchronous oral conversations using headphones and microphone.
- Student checklist – do participants meet the technical hardware and software requirements?
- Additional online activities: Will the students be required to do anything in SL outside of synchronous class meetings? How will they demonstrate that they have achieved the objectives? Will they produce something within SL? Will you use other online technologies like blogs, wikis, Google docs, podcasts, vlogs? Or will the students demonstrate learning via traditional methods like tests, papers, or face to face oral meetings?
- Student support – who will be the main contact? Will you have different contacts for content questions and for technical questions? How will you communicate?
- Who are your resources for collaboration? Make a plan, contact colleagues – cross disciplines if possible.
- Will you use other Second Life in-world resources? There are: orientation areas, scripting classes, basic SL user classes that cover navigating, flying, searching, inventory, etc. Some organizations, like the New Media Consortium, Angel, other classrooms, or other public or private areas
- What is your plan if the virtual world experiences "down-time" or worse case scenario, what if Second Life goes down for an extended period of time?

Collaborative search for information on the Internet by pupils: impacts of friendship

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Abstract

This study aims at describing the impacts of pair interaction during the process of collaborative search for information on the World Wide Web when end-users are young learners from primary school levels. 51 children were asked to search for information on the World Wide Web to find answers to thirteen questions linked to medieval history in three conditions: "Single", "Affinity –", and "Affinity +". In the two last conditions, children were paired by their teachers according to how they perceived their friendship. Results mainly showed that if pairs retrieved effectively more answers, more correct answers, and were more efficient than singles, no significant differences were observed between "Singles" and the two other conditions about the number of Web pages visited and the number of information search cycles. Moreover, pairs in condition "Affinity –" retrieved more answers, more correct answers and were more efficient than pairs in "Affinity +". And finally, pairs composed by friends ("Affinity +") produced significantly more irrelevant queries than pairs composed by children without social affinity. So, if "two heads search better than one" when learners are students, our results moderate this idea when learners are paired in pairs with friendship.

Introduction

Context and problematic

This study aims at describing the impacts of pair interaction during the process of collaborative search for information on the World Wide Web when end-users are young learners from primary school levels. The research here developed is part of a large project (AUPEREL standing for its acronym).

One of the most frequent applications of computers in primary classrooms is the use of search engines and the World Wide Web to search for information. French pupils in primary school levels perform this search activity more and more often in pairs for two reasons. The first reason is linked to teaching, on the basis of a socio-cultural perspective of learners as collaborators based on Vygotsky's theory. But, even if theories of cognitive development and research on classroom practices both tend to favour learning actions that imply pair interactions (Crook, 1994, 1998; Hyun, 2005; Pozzi, Healy & Hoyles, 1993), the interpersonal relationships (i.e., the fact that two pupils like or dislike one another) is rarely considered in academic research. The second reason is based on a more "pragmatic" statement of fact: The number of computers is often just inferior to the needs inside the classrooms. In other words, the activities based

on collaborative search for information are just a necessity due to material constraints which are themselves due to economic ones.

More information is needed about impacts of children's interaction during the information search activity is necessary in order to widen our knowledge of children's searching in this specific context. So, we here suggest to discuss the behaviours in collaborative search for information within settings where groups of end-users (here, children recruited in Grade 3) are physically placed next to each other.

Collaborative information behaviour and the role of friendship

Information seeking is an important and integrated part of problem solving because it affects the quality of the solution to a specific task. While many different models of information seeking have been suggested (Wilson, 1999; for a synthesis, see Dinet & Tricot, 2007), it is implicitly assumed in most of them that the information seeker is an individual. For example, the cognitive point of view in information science has commonly focused on attributes of the individual in order to understand the cognitive and emotional motivations for information behaviour. But a lot of researchers in information science and in cognitive psychology have recently begun to explore the social and contextual dimensions of information behaviour and information seeking, hereby challenging the assumption of the individual information seeker (e.g., Hertzum, 2002; Hyldegard, 2006; Karamuftuoglu, 1998; Lazonder, 2005).

As Hyldegard (2006) said, previous work on Collaborative Information Behaviour (CIB) is characterized by the importance of social factors in acquiring, retrieving, seeking, managing, sharing and generating information. Even though participants are always students or adults, some interesting results have been obtained with the following question: Did group members behave differently from the individual? For instance, in a recent study conducted with students, Lazonder (2005) investigated the impacts of collaboration on web search behaviour and search outcomes by comparing pairs of students and individuals. The results mainly showed that pairs used a wider range of searching strategies than individuals did, were more proficient in monitoring and evaluating their searching behaviours, were faster, and produced a greater number of correct responses to the searching tasks. It's the reason why Lazonder (2005) suggested with humour in the title of his paper that "two heads search better than one". Nevertheless, even though it is implicitly assumed - in most cognitive models of a search for information - that the information seeker is an individual, it is commonly acknowledged that users like young pupils often work in groups or teams that may affect their behaviours as well as their thoughts and feelings (Hyldegard, 2006). According to several studies (Issroff & del Soldato, 1996; Jones & Issroff, 2005; Kumpulainen, 1996; Nahl & Tenopir, 1996; Vass, 2002), social affinity between partners is one of the most important features. As these authors said, many previous studies of computer-supported collaborative learning used pairs of pupils or students who were matched by specific criteria (e.g., cognitive ability) but did not take into account the social affinity between students. By social affinity, we mean a level of respect and a willingness to work together. Issroff and del Soldato (1996) argue that social affinity always has a significant effect on the nature and effectiveness of a collaborative interaction. They refer to a study, performed by del Soldato, which showed that partners who were used to working with one another had already established ways of negotiating their individual and common goals. On the opposite,

partners with no such working relationship had to negotiate the rules of the interaction, which was off-putting for some participants.

Some pieces of work (e.g., Vass, 2002; Jones & Pellegrini, 1996) carried out a detailed study of the impact of one important kind of social affinity: friendship. They showed several benefits of working with a friend in a collaborative setting:

- Friends do not need to negotiate the rules of collaboration, and furthermore they have established ways of working which are implicitly understood rather than explicitly discussed;
- It is typical of children who are friends to also get a better grasp of one another's ideas and state of knowledge than acquaintances can do, which is a crucial point for successful collaboration;
- Friends can use the resources and ways of interacting that were part of their friendship common experience and which they used in informal settings - such as humour and acting out - and use these successfully and efficiently in their activities.

But if a number of studies have examined so far social interaction in a computer context in a different learning context (e.g., Barile & Durso, 2005; Erkens *et al*, 2005), recent literature shows that little is known yet about the quality and processes of pair interaction in a collaboration information searching context. Information about the efficiency of children's interactions in a context of collaborative search for information is, hence, necessary in order to widen our knowledge of children's behaviours in this specific context. So, the aim of the experimental study here presented is to contribute to our understanding of the characteristics of collaborative information behaviour which, in this study, refers to the physical activities and cognitive or emotional experiences of individuals acting as group members and engaged in collaborative information behaviour. On the basis of the definition of collaborative learning through technologies proposed by Dillenbourg (1999), we define the collaborative search for information as being a situation in which two or more people search for or try to search for information together. In other words, we are here focussing on collaborative search for information through technologies in settings where young learners are collaborating side-by-side and where the collaboration appears through the computer use.

Method

Participants

The study was carried out from January to May 2006 in France with 51 children (24 boys and 27 girls) recruited in Grade 3. All the children were French-native speakers, their average age was 8.4 years old (SD = 0.6 years), they belonged to the same school located in the east of France and to the same school level. They were also used to work together during various school periods.

The participants were distributed in three conditions:

- In the condition "Single", 16 children were asked to perform individually the search for information task;
- In the condition "Affinity –", 36 children (18 pairs) children were paired in duo without social friendship to perform the search for information task;

- In the condition "Affinity +", 36 children (18 pairs) children were also paired in duo with real social friendship to perform the search for information task.

In the two last conditions, the children were paired by their teachers according to how they perceived their friendship. The two teachers had only set the pairing on their observations of friendship patterns (i.e., social affinity) that the children had created during the first four months of the school year, i.e., the children's cognitive levels were not taken into account at all for pairing.

Task

Pupils were given the searching task topic for which they were asked to find relevant records using the World Wide Web. More precisely, in each of the three conditions ("Single", "Affinity –", "Affinity +"), the children were asked to search for information on the World Wide Web to find answers to thirteen questions linked to medieval history. In the two conditions "Affinity –" and "Affinity +", the children were using a computer within their respective assigned pairs.

Children had a common goal to reach through the information searching task: to retrieve information on one specific topic so as to prepare a written presentation on medieval history in their school. Each child or each pair was asked to write her/his answers to thirteen questions on a paper which had been dealt out at the beginning of the experiment. The thirteen questions used in our experiment were:

- Find 5 male first names used in the Middle Ages
- Find 5 female first names used in the Middle Ages
- Find a cooking recipe dating from the Middle Ages
- Find a nobleman's clothing of the Middle Ages
- Find a knight's clothing of the Middle Ages
- Find 5 cooking utensils of the Middle Ages
- Find the lyrics of a medieval song
- Find 5 weapons used in the Middle Ages
- Find the names of 3 kings of the Middle Ages
- Find the names of 3 queens of the Middle Ages
- Find 3 trades of the Middle Ages
- Find 3 music instruments of the Middle Ages
- Find the dates for the beginning and for the end of the Middle Age period

Procedure

Pairs ("Affinity –" and "Affinity +") and singled participants had to perform this experiment one at a time. Each received the same instructions and followed the same experimental procedures as all the others. All the sessions took place in a quiet room equipped with one computer. One week before they attended their session, the children had completed a "background" questionnaire. This background questionnaire gave for each child the gender, age, personal experience in the use of a computer, and the number of hours spent in a week searching on the World Wide Web.

At the beginning of a session, the experimenter presented the procedures to the children. The children were then given the paper which had been handed back with the thirteen

questions about medieval history, and the participants (pairs or singles) were asked to search for information on the World Wide Web to find answers to these questions. The children were allowed a maximum of 50 minutes to complete the task: the experiment began as soon as the child or the pair turned the sheet over - with the questions on it - to read them and finished 50 minutes later. The child could ask questions to the experimenter before the search for information actually started. If s/he had no questions and said s/he was ready, the experiment could start.

The search engine used by the children in this study was Google.fr with Internet Explorer 6.0, as these electronic tools were commonly used in this school. The children's ability in using the computer and the search engine Google.fr was checked before the experiment by observing the children at work. The ways in which the children were trained in the search-for-information skills or collaborative working skills were not examined. It was assumed that since the importance of these skills is emphasised in French curricula, teachers had used and developed them in their classrooms.

The experimenter - always the same person - visited the school and classrooms before the data collection. During this familiarisation, which lasted about 4 weeks, the observer was introduced to the classes as a teacher's help although his second role was to observe the participant. This experimenter was with the children all the time while they were searching for information on the World Wide Web. He did not intervene in the children's activity during the search for information process, except when it was absolutely necessary to help the pupils (for instance should an electronic bug or a technical problem happens).

Behavioural indicators
For each group ("Single", "Affinity –", and "Affinity +"), we analysed six behavioural indicators:

- Number of answers (from 0 to 13) given at the end of the information searching task;
- Percentage of correct answers given by the singles or the pairs;
- Number of Web pages visited;
- Number of information searching cycles. We defined a cycle like this: a cycle begins when the child validates a query on Google.fr (i.e., when clicking on the "Search" button) and it finishes when a new query is typewritten;
- Type of errors in the query by distinguishing irrelevant queries (i.e., not related to the search topic, such as "m pokora" who is a popular French singer among young people), queries with spelling errors (e.g., "kitcen") or with no proper word (e.g., "azertyuiopqsdd");
- Efficiency of the search for information strategies (i.e. number of correct answers / number of Web pages visited).

Results and discussion

No differences were observed between pairs ("Affinity –" and "Affinity +") and singles concerning their age, computer experience, and hours per week spent searching the World Wide Web. So our three groups were comparable in terms of age, computer experience, and hours per week spent searching the Web.

For the analyses, data were entered in a 3 (Condition: single, affinity – and affinity +) ANOVA with this factor as a between-groups factor. The main results obtained were:

- The number of responses given by singles is significantly less important that the number of responses given by pairs (with friend or not) ($p<.001$);
- The number of responses given by pairs composed by children without social affinity ("Affinity –") is significantly more important than number of responses given by pairs composed by friends ("Affinity +"; $p<.003$);
- The percentage of correct answers given by singles is significantly less important that the percentage of correct answers given by pairs (with friend or not) ($p<.01$);
- This percentage of correct answers given by pairs composed by children without social affinity ("Affinity –") is significantly more important than percentage of correct answers given by pairs composed by friends ("Affinity +"; $p<.01$);
- Singles are more efficient than pairs, whatever the social affinity between children in these pairs ("Affinity –", $p<.01$; "Affinity –", $p=<.02$). No difference between "Affinity –" and "Affinity +" groups has been found;
- Pairs composed by friends ("Affinity +") produced significantly more irrelevant queries than pairs composed by children without social affinity ("Affinity –"; $p=.001$). No other significant result was observed about the queries.

In other words, if pairs retrieved effectively more answers, more correct answers, and were more efficient than singles, no significant difference were observed about the number of Web pages visited and the number of information search cycles. Moreover, pairs composed by children without social affinity ("Affinity –") retrieved more answers, more correct answers and were more efficient than pairs composed by friends ("Affinity +"). And finally, pairs composed by friends ("Affinity +") produced significantly more irrelevant queries than pairs composed by children without social affinity. So, if "two heads search better than one" (Lazonder, 2005) when learners are students, our results moderate this idea when learners are younger and they are paired in duo with social friendship.

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