IMPROVING STUDENTS ACHIEVEMENT IN SPEED AND ACCURACY BY ADOPTING A BLENDED LEARNING APPROACH

[1]Prof. O. V. Adeolowa & Dr. (Mrs.) [2] J. O. Akhigbe.
[1]Technical and Vocational Education
Ekiti State University Ado-Ekiti

[2]Office Technology and Management
Auchi Polytechnic, Auchi

Abstract

This study investigated the effects of Blended learning approach that is a combination of Computer-Assisted Instruction (CAI) and traditional face to face method, and Demonstration Method on achievement of National Diploma students in Speed and accuracy in Office Technology Management departments in Edo and Delta States Polytechnics. The study adopted quasi experimental research design. The population of the study consisted of 1,721 students of National Diploma students of government owned polytechnics for the 2013/2014 academic session. A sample of 240 students was purposively drawn from three polytechnics. The instrument used for this study was the National Diploma Speed and Accuracy Test (NDSPAT) designed by the researcher to test learners' achievement in Speed and Accuracy, using blended learning approach and a traditional method. Data collected were analyzed using descriptive and inferential statistics. Questions one was analyzed using mean, and bar charts for descriptive statistics, while, ANCOVA was used to analysis question 2 at 0.05 level of significance. Descriptive analysis showed that the three groups were homogenous before treatment, effect of treatment was felt as students taught with blended approach performed better in Speed and Accuracy than those taught with the conventional method of Demonstration. Based on the results of this study, it was recommended that. Lecturers should use blended approach to teach Speed and Accuracy as it has been found to be of great benefit to students at the beginning stage of keyboarding in Office technology and Management departments in Polytechnics.

Introduction

Blended learning refers to the combination of two or more instructional methods or media in teaching and learning activities. Blended learning has been seen, as the combination of face-to-face (traditional classroom learning) and technology-based learning (Stubbs, Martin, & Endlar, 2006). It is a flexible form of learning that constitute a mixed of technologically enabled learning with face to face teaching and interactions by the teacher and the students. It can also be viewed as, blending of different instructional media, blending of different instructional strategies; and blending of different instructional environments (Rooney, 2003; He & Chen, 2008). Tsou (2009) posited that blended learning comprises of at least, the combination of four different methodologies:

a. The blending of different learning contents and the addition of technology-based-learning, such as e-learning or the virtual classroom.

b. The combination of different instructional methods (behaviorist, cognitivist, and constructivist).

c. The blending of different types of instructional technologies (face-to-face, Internet, and CD-ROM).

d. The integration of instructional technology with practical instructional activities.

The major reason for adopting a blended learning approach is to improve pedagogy. The beauty of blended learning is that it combines the advantage of face-to-face teaching (social interaction and inspiration) and on-line instruction (flexibility of access) (Williams, Bland, & Christie, 2008). The term blending was first applied to distance

education and it was referred to as "hybrid," which was developed by the combination of e-learning with traditional learning methods. It is an interactive instructional technique whereby a computer is used to present the instructional material and monitor the learning that takes place. Sormunen, (1993) posited that learning technology alone does not necessarily advance learning, well-integrated learning technologies and practices often do. With learning principles and practices in mind, technology is used to service learning. This new approach is learner centered; the learner is no longer treated as an empty vessel, but is credited with knowledge, skills and attitudes from the day he came to life, which requires development, through guidance, encouragement and motivation.

Computer-Assisted Instruction is an instructional design in which, a computer system delivers instructions directly to learners by allowing them to interact with designed lessons that have been programmed into the system, (Kulik, 1980). If the learner is wrong, he/she is told why and is directed to review another frame. Drill and practice has been associated with Computer Assisted Instruction used in education. Drill and practice programme emphasizes content that has already been covered rather than new material. In this process, mastery of learning is an important key element and the learner must reach a level of proficiency to progress to the next level. Petrakis (1996), enumerated Math Blaster, Mental Math Games, Math Wizard, and Shop Series, as good examples of drill and practice programs in CAI, but today Typing tutor has been added to them. Iserameiya & Anyasi (2008), in a study of 80 junior secondary school students in Nigeria found that students were more creative and more interested in learning during introductory technology lessons with the use of CAI in combination with traditional face to face method. Corroborating this assertion Yusuf & Afolabi (2010), stated that, the use of CAI as a supplement to conventional instruction produces higher achievement than the use of conventional instruction and that, Computer Based Education (CBE) and other computer applications produce higher achievement than traditional method of instruction. Yusuf and Afolabi added that, students learn instructional content faster with CAI than with conventional instruction method alone, they retain what they have learned better with CAI than with conventional instruction alone. Khali & Shashaani (1994), used meta-analytic techniques to examine thirty-six studies and found that although CAI increased student achievement in subject matters, time spent with computers was a significant variable for student achievement. Therefore, they concluded that, the most effective time to learn with CAI was four to seven weeks and the effects of CAI disappeared when used less than three weeks. This goes to show that for experimental research using CAI, the study must not be less than six weeks.

Keyboarding is a skill that allows students to interact efficiently with electronic input devices either for educational purpose, personal usage, or future employment. Keyboarding according to Bartholome (1996), is defined as the manipulation of keys on a standard computer keyboard with emphasis on the output or hard copy. An early definition of keyboarding was "the process of using the appropriate fingers on a typewriter keyboard without regard for formatting problems (McLean, 1986). The touch type method of keyboarding is the positioning of fingers on home key (row) using each finger to key specific keys according to the slogan of the keyboard "asdf;lkj" (Rogers, 1997). The goal of keyboarding instruction is to develop a touch type method that will enable an individual to enter information at a speed that is faster than handwriting. The touch type technique is the striking of the correct keys without looking at the finger, on the keyboard and developed automaticity which is the desired level of performance in speed and accuracy.

Speed and Accuracy in Keyboarding

Speed and Accuracy is the ability to type the correct words from a graded and printed passage under a stipulated period. Speed and Accuracy is also referred to as timed writing in keyboarding. It is very common to see advertisement requesting for confidential secretary I and II with 80 to 100 WPM. The role of speed and accuracy which is usually the first task in keyboarding question is useful in identifying appointable graduates for employment. Hence global labour selection of secretarial personnel gives emphasis to speed and accuracy in keyboarding. Roger (1997), posited that straight-copy timed writing has been a major factor determining the progress or achievement of

students in keyboarding. Ultimate goal of speed and accuracy in keyboarding course is to produce in learners, ability to type at a reasonable fast rate with a high degree of accuracy. Ndinechi (1990) opined that, Speed gained in keyboarding results from crowding successive motions ever closer in time so as to reduce delays between motions and facilitates changing of responses, therefore the differences in performance of the expert secretary and the learner is wasted motion. While, accuracy is getting the correct imprint on the screen or paper when printed, using correct fingers. Speed and accuracy are built upon well-developed technique, which should be taught at the beginning and then developed through on-going reinforcement (Crews, North, and Erthal, 2006)

Why Speed and Accuracy Should Be Taught

Despite the advancement in science and technology, the keyboard is the most common device used to interact with a computer. Keyboarding skills remain a top requirement for today's students and workers in secretarial profession. People who use computer to communicate with others are at a disadvantage if they cannot type using the keyboard. Ober (1993) stated that the fingertips will remain the primary means of data entry in the future. In most offices and business there are many individuals impeded by lack of keyboarding skill, and many others hampered by bad habits and improper technique developed over years of using the keyboard, (Olinzock, 1998). These statements point to the fact that lack of good typing skills would hinder and frustrate people who attempt to use the computer, and so effort must be made to improve its teaching and learning. Employers value competency at the keyboard as evidenced by the listing of top priorities. Employers identified problem-solving, computer skills, and communications, using keyboarding as a top priority listed under computer skills, (keyboarding, 2006). Businesses today expect employees to type and edit their own documents using touch keyboarding skills. Proper touch keyboarding is essential since it helps to improve productivity and efficiency.

Statement of the Problem

Mass failure in Speed and Accuracy has become a major concern to lecturers even when keyboarding speed has been reduced by the National Board for Technical Education (NBTE) from 35 WPM to 20 WPM at ND level (NBTE Course Specification, 2005). With the introduction of computer into education system, it has been observed that teaching and learning could be improved upon with the use of Computer-Assisted Instruction (CAI), hence this study to fore the brought to the fore effectiveness of blended learning approach in speed and accuracy in keyboarding in Office Technology and Management Departments in Polytechnics.

Purpose of the study

The purpose of this study was to investigate if blended learning that is a combination of Computer-Assisted Instruction (CAI) and traditional method would make any significant improvement on student's achievement in Speed and Accuracy in office Technology and Management department.

Research Questions

1. What is the level of performance of National Diploma Students in Speed and Accuracy?

2. Is there any difference in the achievement of students in Speed and Accuracy between the experimental and control groups

Significance of the study

The finding could create awareness on the use of blended learning for effective teaching learning of Speed and Accuracy in keyboarding in Nigerian Polytechnics. The result from this study could help lecturers in Office Technology and Management in planning appropriate teaching strategies to be used when teaching speed and accuracy in keyboarding.

Method

A quasi-experimental research design of pre-test; post-test and control group design was used for this study. The independent variables for the study is teaching method, appearing in two level, Computer-Assisted Instruction and traditional method, demonstration method and the Control Group.

The population of the study consisted of 1224 National Diploma year one students of Office Technology and Management for the 2013/2014 academic session in five Government

Polytechnics in Edo and Delta state, Nigeria which were: Auchi Polytechnic, Auchi, Delta State Polytechnic, Ugwashiu-uku, Delta State Polytechnic, Oghara, Edo State Institute of Technology and Management, Delta State Polytechnic, Ozoro

The instrument for this study was National Diploma Speed and Accuracy Test (NDSPAT) designed by the researcher to test learners' achievement. NDSPAT was subjected to, face, content and construct validity. For construct validity a correlation coefficient of 0.82 using Pearson Product Moment Correlation analysis was obtained

A sample of 240 students were purposively selected in three polytechnics in Edo and Delta states, this represent 20% of the entire population. The Researcher used the cluster sampling technique to select two stream (A and B) per school. This was because computers in the laboratory are arranged 40 in each laboratory, this brings the total sample for one group to 80. In all the three schools considered, intact classes were used for the experimental and control groups.

Research Materials and Procedure The research materials used for this study were the Computer software typing tutor by Mavis Beacon (2007) under the license of Creative Commons Attribution- 4.0 education (CC-BY-4.0 education) and keyboarding Textbook.

To investigate the effect of CAI/traditional method, and Demonstration Method on achievement of Speed and Accuracy, a pre-test was administered and there after treatment. The instrument was administered on three groups as pre-test, thereafter experimental group I was exposed to Computer-Assisted Instruction (CAI) along with the traditional method. Experimental Group 2 was exposed to only Demonstration method of teaching. The third group, which was the control group was not exposed to conventional method. Data collected were analyzed using descriptive and inferential statistics of means standard deviation and ANCOVA. Statistical Package for Social Sciences (SPSS) was used for statistical analysis.

Results

Question 1 What is the level of performance of National Diploma Students in Speed and Accuracy?

In order to answer the question, scores of National Diploma year one students on Speed and Accuracy scores were obtained before they were subjected to treatment. These scores were graded based on NBTE grading system as presented below in Table 1 and Figure1

Table 1: Level of Performance of National Diploma (ND) Year One Students in Speed and Accuracy.

Grade	Frequency	Percentage
Fail: 0 – 39	237	98.8
Pass: 40 – 49	3	1.2
Credit: 50 – 69	-	-
Distinction: 70 and Above	-	-
Total	240	100.0

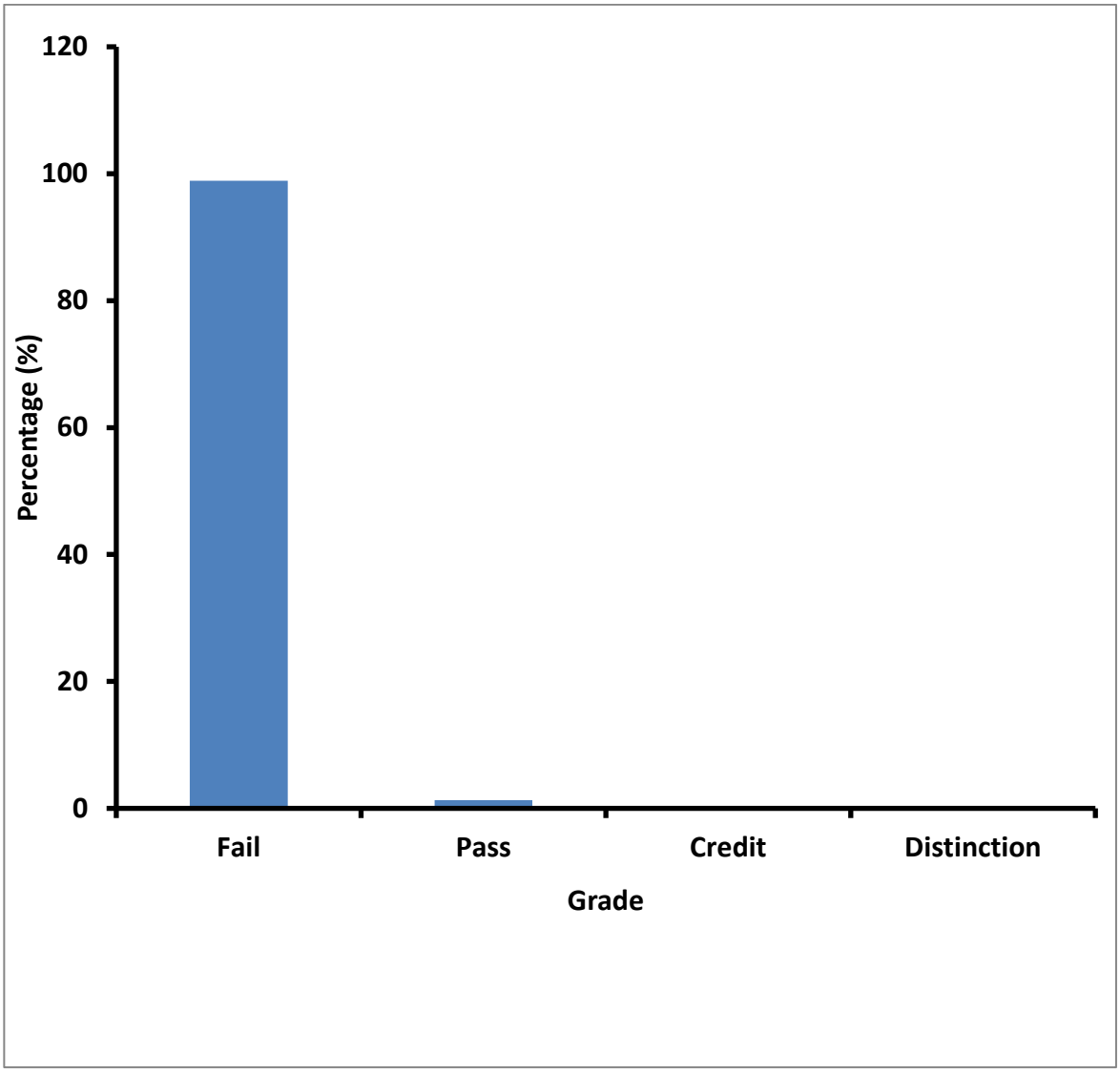

Fig. 1 **Bar Chart showing students performance in speed and accuracy before treatment.**

Table 1 and Figure 1 show that majority (98.8%) of the students failed while, only 1.2% passed speed and accuracy in keyboarding. Therefore, the level of performance of National Diploma Students in speed and accuracy before exposure to instructional strategies was very low.

Question 2. Is there any difference in the achievement of students in speed and accuracy between the experimental and control groups.

Mean scores of students on speed and accuracy in experimental and control groups were computed and compared for statistical significance using Analysis of Covariance (ANCOVA) at 0.05 level. The result is presented in Table 2.

Table 2: ANCOVA of Students' Achievement in Speed and Accuracy by Treatment.

Source	SS	df	MS	F_{cal}	P	F_{table}
Corrected Model	545.865	3	181.955	51.373	0.000	2.60
Covariate (Pretest)	15.232	1	15.232	4.301	0.039	3.84
Group	545.056	2	272.528	*76.946	0.000	3.00
Error	835.868	236	3.542			
Corrected Total	1381.733	239				
Total	2022.000	240				

*Significant **P < 0.05**

Table 2 shows that there is a significant difference in the achievement of students in speed and accuracy between the experimental and control groups (Fcal. = 76.946, P < 0.05). The null hypothesis was rejected. In order to locate the sources of pair-wise significant difference among the experimental and control groups, scheffe post hoc test was applied. The result is shown in Table 3.

Table 3: Scheffe Post hoc Analysis of Students' Achievement in Speed and Accuracy by Treatments.

Groups	CAPI/Demon	Demonstration	Control	Mean	N
CAPI/Traditional		*	*	3.73	80
Demonstration				0.78	80
Control				0.40	80

*** Mean difference is significant at 0.05 level**

Table 3 shows that there is significant difference between achievements mean scores of students in speed and accuracy taught with CAI and traditional method, demonstration and Control. However, there is no significant difference between the mean scores of subjects in Demonstration and Control group. Multiple Classification Analysis (MCA) was also used to determine the effect of treatment on students' achievement in speed and accuracy. The result is shown in Table 4.

Table 4: Multiple Classification Analysis of Students' Achievement in Speed and Accuracy by Treatment.

Grand Mean = 1.63

Variable + Category	N	Unadjusted Devn'	Eta	Adjusted For Independent + Covariate	Beta
CAPI/traditional	80	2.10		2.11	
Demonstration	80	-0.85		-0.86	
Control	80	-1.23		-1.24	
Multiple R					.024
MultipleR^2					.001

Table 4 reveals that, with a grand mean of 1.63, students in the CAI/traditional group had the highest adjusted mean score of 3.74 (1.63 + 2.11). This was followed by those exposed to demonstration method with an adjusted mean score of 0.77 (1.63+(-0.86), while the control group had the least adjusted mean score of 0.39 (1.63+(-1.24). It implies that blended learning has the potency of significantly enhancing students' performance in speed and accuracy.

Discussion

The findings of this study revealed that, there was no significant difference between the pretest mean scores of experimental and control groups. The level of performance of students in National Diploma Year One in speed and accuracy was generally low as those that passed were at the lowest border of 40 marks according to NBTE grading system, before they were exposed to treatments. This is a fact as many students do not pass speed and accuracy task in keyboarding examination in Polytechnics. Effect of treatment was felt as the mean score and standard deviation of experimental groups showed that there was a substantial difference between the pre-test and post-test mean scores of students taught with blended method that is a combination of CAI and traditional method. It was however established that bended method served a very useful purpose for learning basic concepts and practice of speed and accuracy in keyboarding. This finding is supported by Iserameiya, and Anyasi (2008), Yusuf and Afolabi (2010).

Findings on the study indicated that, there was a significant difference in the achievement of students in speed and Accuracy between experimental and control groups. The difference favoured group one that uses Computer-Assisted

Instruction method in addition to traditional method of teaching. This implies that, blended method facilitates achievement in speed and accuracy. This finding is corroborated by Ober (1993) and Olinzock (1998) who were of the opinion that, the fingertips remained the primary means of data entry into any type of computer system in the nearest future and therefore emphasized the mastering of keyboarding skills in speed and Accuracy is imperative. Crews, North, and Erthal (2006) findings also corroborates this finding, when they observed that, speed and accuracy were built upon a well-developed technique, which should be taught at the beginning and then developed through reinforcement and drill and practice.

Findings

1. There was no significant difference between the pretest means scores of experimental and control groups. This indicated that the groups were homogenous.
2. The result shows that blended approach of learning is effective in teaching and learning of Speed and Accuracy in keyboarding.

Conclusion

Blended approach is found to be more effective than demonstration method for teaching and learning speed and accuracy in keyboarding in polytechnics. This implies blended learning is more dependable for good understanding achievement in speed and accuracy. Learning Speed and accuracy with blended approach is an indication that hope is not lost in the teaching and learning of keyboarding in Office Technology and Management Departments in Nigeria Polytechnics

Recommendations

Based on the result and findings it was recommended that;-

1. Lecturers in Office Technology and Management should use Blended learning approach, when teaching Speed and Accuracy in keyboarding, as it has been found to enhance students' achievement.

References

Bartholomew, L. W. (1994). Typewriting and Keyboarding instruction in Elementary School. *Proceedings of the 1994 International Conference, Academy of Business Administration*, Retrieved May 3 2014 from http://schools.utah.gov/cte/documents/keyboarding/research/EK_TypewritingKeyboardingInstruction.pdf

Crews, T. B., North, A. B., & Erthal, M. J. (2006). Elementary/middle school keyboarding strategies guide (3rd ed.). Reston, Virginia: Nat ional Business Education Association. Retrieved Feb. 24 2014 from http://faculty.indstate.edu/wwilhelm/BEIT%20492-592/KEYING%20UP%20FOR%20KEYBOARDING.pdf

He C.Y. and Chen T.L. 2008. Application of blended learning in enterprise training. Cyber-sociology communication. Retrieved 16/2/1015 from http://www.nhu.edu.tw/~society/e-j/75/75-08.htm 2/9/2014.

Iserameiya, F.E. & F.I. Anyasi, (2008) Effect of programmed instruction on the academic achievement of students in introductory technology. *The Social Science Journal,* www.medwelljournals.com/abstract/?doi=science.2008.371.375

Keyboarding. (2004). *A skill for the new millennium. Type Quick News*. Retrieved January 18th 2013 from http://www.typequick.com/neews/newmill.htm

Khali, A. & Shashaani, L. (1994). The effectiveness of computer applications: A meta-Analysis. *Journal of Research on Computing in Education,. 27 (1)*, 48-61.

Kulik, J. A. Kulik, C.C. & Cohen , P.A. (1980) Effectiveness of computer based college teaching: A meta analysis of finding. Retrived Jan 22, 2014 from http://www.uky.edu/~gmswan3/575/Kulik_Kulik_Cohen_1980.pdf

McLean, G. (1986). *Computers keys, (Elementary edition) numbers and symbols student tutorial, games and drills*. Retrieved December 13th 2013 from http://www.nap.edu/html/select_sci_k12/chl. html

National Board for Technical Education. (2005). *National diploma in office technology and*

management curriculum and course specification. Kaduna. ATMAN Ltd.

Ndinechi, G.I. (1990). A guide for effective typewriting instruction in secondary school. *Business Education Journal, Volume 2 (2)* pp. 13-21.

Ober. S. (1993). A philosophy for teaching keyboarding. *Business Education Forum, 48(1)*, pp.36-38.

Oborah J.O. & Eze M.E (2013) Appraisal of the standard of performance in Keyboarding among Higher National Diploma students in Federal Polytechnic Idah 1 (2) 261 268. *Nigeria Journal of Business Education.* Association of Business Educators

Olinzock, A. (1998). Computer skill building: The answer to keyboarding instruction. *Business Education Forum, Vol. 52(3)* Retrieved from www.meser.org/megl/stories/z-jornal/mjss.

Petrakis, M. (2000). The effect of the constructivist approach and computer-assisted instruction on students' achievements and attitude in biology. *Turkish Online Journal of Educational Technology 10 (1)*. Retrieved February 2nd 2013 from http://www.tojet.net/articles/6311.htm

Stubbs M., Martin I. and Endlar, L. 2006. The structuration of blended learning: putting holistic design principles into practice. British Journal of Education Technology, 37(2):163-175.

Sormunen, C. (1993). Learning style: An analysis of factors affecting keyboarding achievement of elementary school students. *The Delta Pi Epsilon Journal* (35),1, 26-38 Retrieved 24/3/2014 from http://www.tojet.net/articles/918.ptf

. Oguz S. (2011). The effects of the computer-based instruction on achievement and problem solving skills of the Science and Technology Students. *The Turkish Online Journal of Educational Technology*. Retrieved from http://www.tojet.net/articles/vloil/10119 ptf

Tsuo H.C. (2009). Current status of e-learning and preliminary investigation on its output value. Institute for Information Industry. Available at http://eportfolio.tkb. com.tw/web/tkb0000152/3.Accessed September 1, 2010.

Williams N.A., Bland W. and Christie G. 2008. Improving student achievement and satisfaction by adopting a blended learning approach to inorganic chemistry. Chemistry Education Research and Practice, 9:43-50.

Yusuf, M. O & Afolabi A. O. (2010). Effects of computer-assisted instruction (CAI) on secondary school students' performance in biology. *Turkish. Online Journal of. Educational Technology, 9(1): 62-69.* Retrieved May 15 2012 from http://www.**academia.edu/2648739**