Blended Library and Multimedia Model in Geography Teaching

Saeid Asadi

Department of Library and Information Studies
Shahed University
Tehran, Iran
s.asadi@shahed.ac.ir

Hamid R. Jamali

Department of Library and Information Studies
Faculty of Psychology and Education
Tarbiat Moallem University
Tehran, Iran
h.jamali@gmail.com

Abstract— **Libraries have been established and always utilized in old fashion and modern school and academic environments in order to support educational programs. However, new instructional technologies have changed traditional library-based teaching models. Multimedia approach has shown successful in teaching different courses to different learners. However, there is little known how a combination of library and multimedia approach can be implemented and measured in teaching. This paper focuses on an innovative approach in which a blended library and multimedia model has been developed to teach geography concepts. It was implemented in teaching geography in a first grade class in an Iranian secondary school. The empirical results revealed the effectiveness of the blended model in learning and retention of geography.**

Keywords-Multimeadia teaching, Geography, Multimedia educational applications, Library

I.   INTRODUCTION

For a very long time, libraries have been considered as one of the main sources of information for personal needs, research activities and educational purposes. They have been perfectly inserted in academic and school environments and have supported educational programs. Traditionally, the library role in an educational system is to support any major or course offered by the institute they are affiliated to [1]. To reach this goal, school and academic librarians often select and acquire useful print and non-print materials and provide information or sources to fulfill students and educators educational needs. In advanced cases, teacher librarian is trained and appointed in school libraries, which is eligible to perform as both librarian and teacher.

Libraries also have been capable to adapt to changes in information sources and technologies. Audio-visual materials, CDs and other electronic resources are often found in libraries. Online access to bibliographic and full text databases of journals, patents etc. is now available in many educational libraries. In general, it is no doubt that libraries are still fundamental for educational systems. However, dramatic changes in information sources and technologies have challenged the traditional role of libraries in information and educational services.

Information and communication technologies (ICT) have influenced the establishment and projection of educational programs not only in higher education but also in general school level. Computer-based educational applications and the World Wide Web have made possible the delivery of virtual learning environments to students more effectively. Design, publishing and implementation of multimedia educational programs are now being practice in almost all fields, courses and levels in an extent that makes is hard to imagine learning activities totally free of multimedia sources.

It is believed that social changes caused by new technologies, have challenged traditional speech model of teaching [2].

Measuring the effects of different variables on the learning of different groups is a favorite task for many studies such as [3], [4], [5] and [6]. There are also many studies dedicated to the relationship between school library and teaching efficacy and effectiveness e.g. [1], [9], [10] and [11]. However, there is little studied and known how a combination of library and multimedia approach may impact the quality of teaching. This paper aims to address this issue. To do so, an innovative approach has been developed in which a blended library and multimedia model is used to teach geography concepts to secondary school students.

Two hypotheses are examined in this research:

1)   There is a statistically significant difference between the average learning grades of the experimental group and the control group.

2)   There is a statistically significant difference between the average retention grades of the experimental group and the control group.

The rest of this paper stands as follows: first, the literature on the topic is reviewed briefly. Then the research method and settings are discussed followed by the findings and discussions.

II.   RELATED WORK

The use of library in teaching models has been studied and addressed in many papers.

Tuzun et al [7] reported a research in which a three-dimensional educational computer game was designed to facilitate teaching of geography. It was used in teaching geography to twenty four students in fourth and fifth grades in a private school in Ankara, Turkey in three weeks. An

experimental pre post test was used to measure outcomes. The results showed that students' progress was significant. The students demonstrated more significant motivations for learning in the game-based environment. Computer games also lead the students pay less attention to marks; however, they became more independent in the game-based activities.

Parks, Huot, Hamers and H.-Lemonnierl [5] report on a project-based teaching program in networked classrooms equipped with laptop computers in Quebec, Canada. They discuss a model of language learning and teaching in which language is considered broadly in semiotic terms and computer technology is viewed as a representational resource.

III. METHODOLOGY

A. ResearchMethod

This study was based on an experimental setup. Table I shows the exams and the variable used in the research. Three twin tests were used in order to make it possible to measure the differences in the groups' progress. The two groups were exposed to a uniformed pre-test exam in order to measure their primary situation. Then the external independent variable i.e. the blended library and multimedia approach was used in the experimental group while the control group was taught the geography in a traditional library-based way. In the end of teaching, a similar post test (1) was run on both groups. After three weeks the 2nd post test was run measure the level of retention.

TABLE I.   EXPERIMENTAL SETUP

Test Setup	Pre Test	Variable	Post Test 1	Post Test 2
Control	T1	-	T3	T5
Experimental	T2	X	T4	T6

B. Population and Sapmle

The population used in this study was all 2nd level students in the secondary schools of Tehran, Iran. According to the nature of experimental research studies, it was hard to include many students in the test. Therefore, the sample of this study was reduced to two classes, one experimental and one control groups. Each class consisted of 20 students. The control and the experimental groups were deliberately used from the same school to make sure their facilities and environment was similar. It is notable that the whole forty students were boys as the school was boys' school.

C. Content and Multimedia Program

From the geography book of the secondary school, three courses were chosen and a specific educational program was developed using Multimedia Builder 4.9.8 with keeping in mind to have an interactive multimedia application. The program included the geography book contents of the selected chapters, related photos from the book and obtained from other sources in the school library, films on geography,

quiz and extra parts for increasing the degree of user attention to the product.

IV. FINDINGS

The empirical results of the study are shortly described here.

Table II shows the brief results for the pre-test exam. The number of students in each class was 20. The marks are between zero and twenty. The average mark of the control group is obviously higher than the experimental group. The standard deviation is 0.58 for the control group and 1.22 for the experimental.

TABLE II.   PRE-TEST RESULTS

Pre-Test Exam	No.	Min	Max	Average	Standard deviation
Control	20	18	20	19.62	0.58
Experimental	20	16	20	18.63	1.22

a. Marks are between 0 and 20

After using the blended model in the experimental group and the traditional library-based approach in the control group for three weeks, the uniformed post-test 1 exam was run on both groups. Table III summarizes the results for the mentioned exam. All students attended the exam and their average mark was 18 for the control and 18.68 for the experimental group. The standard deviation of the control group was 1.42 while this was 0.90 for the experimental group.

TABLE III.   POST-TEST 1 (LEARNING) RESULTS

Post-Test 1 Exam	No.	Min	Max	Average	Standard deviation
Control	20	14	19.5	18	1.42
Experimental	20	16.5	20	18.68	0.90

a. Marks are between 0 and 20

To measure the retention of geography in the experimental and control groups, the third set of twin exams was run three weeks after the post-test 1. Table IV shows the results for post-test 2 exam. The average marks have dropped in the two groups compared to the pre-test and post-test 1 exams due to the fact that learned information gradually may disappear in mind. Standard deviation was calculated 3.70 and 2.001 for control and exam groups.

TABLE IV.   POST-TEST 2 (RETENTION) RESULTS

Post-Test 2 Exam	No.	Min	Max	Average	Standard deviation
Control	20	4.75	20	10.86	3.70
Experimental	20	10	18.25	14.15	2.001

a. Marks are between 0 and 20

The results in previous tables show increase in marks in post-test 1 and reduce in post-test 2. To understand how statistically the differences are significant, *T*-test statistical model was used in order to compare the average marks of each group in pre-test and post-test 1. Table V shows the analytical results for the first hypothesis.

TABLE V.   T-TEST RESULTS FOR LEARNING DIFFERENCES

Pre-Test Exam	No.	Standard deviation	Fault value	*T*	Degree of Freedom	P-Value
Control	20	0.58	0.31	1.87	19	0.000
Experimental	20	1.22	0.27			

According to the table, the *t* value is calculated 1.87 which shows significant differences as the p-value is less than the significance level of 0.05. This rejects the null hypothesis and approves the difference between experiment and control groups in case of learning geography.

Table VI shows the results for the second hypothesis of the research which is about retention.

TABLE VI.   T-TEST RESULTS FOR RETENTION DIFFERENCES

Pre-Test Exam	No.	Standard deviation	Fault value	*T*	Degree of Freedom	P-Value
Control	20	3.70	0.82	4.14	19	0.03
Experimental	20	2.001	0.44			

According to the table, the *t* value is calculated 4.14 which shows significant differences as the *p*-value is less than the significance level of 0.05. This again rejects the null hypothesis and approves the difference between experiment and control groups in case of retention of geography.

V.   DISCUSSION AND CONCLUSION

This study discussed the lack of studies on measuring the impact of blended library and multimedia approach for teaching geography to school students. The experimental results revealed that both hypotheses of the research are approved. In summary, it can be said that:

COMBINING LIBRARY AND MULTIMEDIA FACILITIES CAN LEAD TO BETTER LEARNING OF GEOGRAPHY CONCEPTS.

COMBINING LIBRARY AND MULTIMEDIA FACILITIES CAN LEAD TO BETTER RETENTION OF GEOGRAPHY CONCEPTS.

While these results can shed light to the fact that blending traditional and modern teaching tools can lead to better teaching models, there are still vague and unsolved issues with innovative blended teaching.

REFERENCES

[1]   K.C. Lance, "Impact of School Library Media Centers on Academic Achievement", ERIC Digest, ED372759 May 1994. ERIC Clearinghouse on Information and Technology, Syracuse, NY.

[2]   .M. Shelly, "Geographic Education Research and the Changing Institutional Structure of American Education," Professional Geographer, No.51, 1999, pp. 492 497.

[3]   Y.K. Cliffliao, "Effects of hypermedia on students achievement : A meta-analysis," Journal of Educational Multimedia and Hypermedia. Vol. 8, lssue. 3, 1999, pp. 255- 277.

[4]   N. D. Carter, Using The Internet an educational tool in geography courses. MA Dissertation, California State University, 2000. In Dissertation Abstracts lnternational, 38(04), 879p.

[5]   S. Parks, D. Huot, J. Hamers and F. H.-Lemonnierl, "Crossing bourndaries: Multimedia technology and pedagogical innovation in a high school class." Language Learning & Technology, Volume 7, Number 1Jan. 2003, pp. 28-45.

[6]   J. R. Hill et al., "Exploring Research on Internet-Based Learning: From Infrastructure to Interactions," in *Handbook of Research for Educational Communications and Technology* (2nd ed.), D. H. Jonassen, ed. (Mahwah, N.J.: Lawrence Erlbaum Associates, 2004), pp. 433–460.

[7]   H. Tuzun et al, "The effects of computer games on primary school students' achievement and motivation in geography learning" Computer & Education, Vol. 52, Issue 1, January 2009, pp. 68-77.

Article in a conference proceedings:

[8]   K. T. Seong, " Interactive multimedia and GIS applications for teaching school geography", International Research in Geographical and Environmental Education, Volume 5, Issue 3, 1996, 205-212.

[9]   G. A. Straessle, Teachers' and administrators' perceptions and expectations of the instructional consultation role of the library media specialist, Washington: Pacific Lutheran University, 2000.

[10] E. Farber, College Libraries and the Teaching/Learning Process: A 25-Year Reflection. Journal of Academic Librarianship, v25 n3, May 1999,pp171-77.

[11] P. Moore and A. St. George Moore, "Children as Information Seekers: The Cognitive Demands of Books and Library Systems", School Library Media Quarterly, v19 n3, 1991, pp161-68, 1991.