

Technology Based Learning Environment and Student Achievement in English as a Foreign Language in Pakistan

M. Athar Hussain, M. Zafar Iqbal., M. Saeed Akhtar

Abstract—The fast growing accessibility and capability of emerging technologies have fashioned enormous possibilities of designing, developing and implementing innovative teaching methods in the classroom. The global technological scenario has paved the way to new pedagogies in teaching-learning process focusing on technology based learning environment and its impact on student achievement. The present experimental study was conducted to determine the effectiveness of technology based learning environment on student achievement in English as a foreign language. The sample of the study was 90 students of 10th grade of a public school located in Islamabad. A pretest- posttest equivalent group design was used to compare the achievement of the two groups. A Pretest and A posttest containing 50 items each from English textbook were developed and administered. The collected data were statistically analyzed. The results showed that there was a significant difference between the mean scores of Experimental group and the Control group. The performance of Experimental group was better on posttest scores that indicted that teaching through technology based learning environment enhanced the achievement level of the students. On the basis of the results, it was recommended that teaching and learning through information and communication technologies may be adopted to enhance the language learning capability of the students.

Keywords—English as a Foreign Language, Student Achievement, Technology Based Learning

I. INTRODUCTION

SINCE the ICT revolution is a revolution in learning, it also has transformed available technologies, the mean and methods of studying, the modalities of school operations, the manner of investment and expenditure of resources and the very way we think about education could be and should do. For extending the learning of students, use of ICT is acknowledged as a learning tool for pupils and has acknowledged how pupils who are confident and proficient in ICT can bring with them opportunities for extending their learning as they use their ICT in other subjects in the school curriculum.

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However, existing and emerging ICT teaching tools provide further opportunities to enhance subjects and add value to teaching and learning. For example, the use of interactive whiteboards, video projection units, microscopes connected to computers, prepared spreadsheets to capture and model data, CD-ROMs, presentations with video and carefully selected resources from the Internet all provide examples of how ICT can be embedded into subject teaching [1]. Use of ICT by a teacher may involve little or no use of ICT by pupils and, consequently, may do little to apply and develop their ICT capability. However, use of ICT by the teacher can enhance and stimulate the learning experiences of pupils and contribute to the achievement of subject objectives. It is important to recognize the different contributions that ICT can make to teaching and learning.

In this new era, due to enhancement of technology, educational institutions are serving more ethnically, and culturally diverse student body than ever before. Studies about education, Cognitive psychology, and neurology have offered new insights on how humans learn. In addition, the infusion of technology has redefined work skills and society's expectations about what it means to be an educated person.

Teachers are using different methodologies to teach their students in a better way. There are a number of techniques and methodologies for diverse situations in the classrooms, and also many learning theories given by different psychologists. One of these is 'Constructivism,' which provides a valuable Framework for using computers and other technologies in interesting ways. With the help of the technology, students gain understanding about their world, and enhance their learning and work by increasing their connections with resources outside school walls. However, computers are not inherently instructional tools, and most teachers need suggestions for using them.

Computers can support the variety of ways learners construct their own understanding. Students who gather information from the Internet can be self-directed and independent [2]. They can choose what sources to examine and what connections to pursue. Depending on the parameters set by teachers, the students may be in complete control of their topics and their explorations.

Of course, there has been some concern that educational institutes are investing in such delivery modes as a response to a 'technological imperative' [3] or as a cost-cutting exercise [4], rather than for good educational and pedagogical reasons. Further, it has been argued that such educational delivery

neither is what students want [5], nor delivers a good learning environment [6]. Without a doubt, such concerns need to be addressed, but [7, 8 & 9] all indicate that it is not the actual technology of delivery that is important, but rather it is how the teacher/lecturer uses that technology to create new experiences for the learner that are important in creating a good learning experience. There is also a growing body of literature arguing the need to create Internet-based learning solutions that are explicitly grounded in learning theory [10, 11, & 12] to ensure a high-quality learning environment.

Research has shown that the learning environment is an alterable educational variable which can directly influence cognitive and affective outcomes [13 & 14]. Langford pointed out that 30–60% of our learning was due to our brain's wiring and 40–70% was a result of the environmental impact [15]. From this suggestion, it is obvious that, while the environment is not the only variable which affects learning outcomes, it is a very important one.

Cooke pointed out that all innovative approaches, no matter how simple or complex should be designed with the students in mind. Students' perspective on such innovations is critical [16]. For many high school students, systematic integration of web-based applications into teaching routines is still in its infancy. New initiatives can be sustained provided that there are appropriate research and development mechanisms in place to evaluate them. By applying some of the research techniques associated with learning environments, the success of such innovative practices can be adequately ascertained.

II. REVIEW OF THE RELATED LITERATURE

The use of modern technology in teaching languages has been dramatically increasing worldwide over the past decade [17]. With the creation of the World Wide Web, it has become possible and feasible for language teachers to make effective use of instructional materials, especially in teaching language and culture [18].

Teachers play a crucial role in the adoption and implementation of ICT in education since they are the key to making learning happen. Earlier studies for example, Pelgrum have reported, teacher's lack of ICT knowledge and skills to be a major obstacle to implementation, and consequently pointed to the need for further training for teachers [19]. It is important to recognize that the introduction to computers into schools is much more complicated than the introduction of new educational technologies. It is a complex innovation, which poses considerable challenges to teachers into daily work. Education reforms require teachers to adopt new roles as more responsibilities for learning are given directly to the students. This change require that teachers be proficient in advising and guiding students through more autonomous, self-directed learning processes, while the same time monitoring curriculum standards achieved by students.

According to Zandvliet and Fraser, students' satisfaction with their learning and classroom independence and task orientation are related to teachers' behaviors, instructional strategies, learning processes and learning settings. Although these factors are related to classroom psychosocial environment, no direct association between student

satisfaction and measures of the physical classroom aspects (such as work space and visual environments) was found [20]. When new information technologies were used, significant associations between physical and psychosocial learning environment variables in the classrooms were reported by those authors. According to this point of view, students comprise the main facet of a classroom because their perceptions of the class's reality and their subjective interpretation of that reality constitute what determines their learning behavior in the classroom. Some studies found a strong correlation between academic achievement and the classroom learning environment of high-school biology students taught in an inquiry teaching/learning mode in classroom and laboratory settings, and they reported significant differences between chemistry students taught using inquiry and more conventional, expository methods. The constructivist conception of learning and its pedagogical application go hand-in-hand with the learning environment [21].

Krashen and Terrel suggest that, when teaching a second language, it is better to use language to transmit messages rather than to teach it explicitly for conscious learning [22]. It has been suggested that, whenever possible, teachers should show objects, draw pictures or act out meanings of what is said when trying to communicate with non-English speaking students [23].

III. PURPOSE OF THE STUDY

The purpose of this study was to find out the effectiveness of instructional strategy in technology based learning environment on student achievement in English as a foreign language in Pakistan. The following research questions were designed to address the problem:

1. Is there any significant difference between the achievement of students who got and who did not get instructions in technology based learning environment according to their pretest and posttest results.
2. Is there any significant difference between the achievement of High achievers who got and who did not get instructions in technology based learning environment according to their pre test and post test results.
3. Is there any significant difference between the achievement of Low achievers who got and who did not get instructions in technology based learning environment according to their pre test and post test results.

IV. METHOD

The sample of this study consisted of 90 male students of grade XI studying at Federal Government Postgraduate College, Islamabad, Pakistan. As the college was a public sector institution located in capital, students from various socio-economic backgrounds from different parts of the country were eligible to join it. Most of the public sector

institutions use traditional method of instruction in which teacher delivers lectures and students listen passively. The age of XI grade students ranged between 15 to 17 years and they had completed first fifteen lesson of their English textbook. Sample students were randomly divided into two groups i.e. control group and experimental group, each consisting of 45 students on equivalent basis. The class sections were allotted randomly to control and experimental groups. To measure the achievement level of students, two different types of tests (pretest and posttest) were developed by the researcher which were administered after validation. The tests consisted of multiple choice items, short questions and comprehension exercise. The students of experimental group were taught through using computer technology and they were provide a learning environment based on computer lab, internet usage, emails, chatting, online material availability and web based instruction. After collecting the data, the responses were scored; means and t-values were calculated for determining the significance.

On this pre-testing the students were divided into two groups' i.e. experimental groups and control groups. The test for achievement was conceptual in nature. Seven lessons were taught in the pre-testing and similarly seven lessons were taught in the post testing. But these lessons were different from the pre-test.

The split half method (odd-even) was used to test the reliability of post-test scores obtained by the students who formed the sample of the study. The coefficient of reliability was determined through the use of Spearman Brown Prophecy formula estimating reliability from the comparable values of the post- test. It was found to be .83.

V. RESULTS

The data collected through achievement tests which were conceptual in nature, were statistically analyzed. The analysis and presentation of data are given below:

Research question no 1. Is there any significant difference between the achievement of students who got and who did not get instructions in technology based learning environment according to their pretest and posttest results?

TABLE I
COMPARISON OF EXPERIMENTAL GROUP AND CONTROL GROUP ON PRETEST

Group	N	df	Mean	SD	SE _D	t-value
Experimental	45	44	25	8	6.78	0.658
Control	45	44	24	8		

$P > 0.05$; $df = 44$

Table 1 depicts that the calculated value of $t = 0.658$ is less than the table value $= 2.02$ at $\alpha = .05$ level. It explains that there is no significant difference between the achievements of

Experimental group and Control group at the time of pre-test. Hence, the null hypothesis is supported.

TABLE II
COMPARISON OF EXPERIMENTAL GROUP AND CONTROL GROUP ON POSTTEST

Group	N	df	Mean	SD	SE _D	t-value
Experimental	45	44	35	9.01	1.66	2.43
Control	45	44	31	6.24		

$P > 0.05$; $df = 44$

Table 2 shows that the calculated value of $t = 2.43$ is greater than the table value $= 2.02$ at $\alpha = .05$ level. It explains that there is a significant difference between the achievements of Experimental group and Control group on posttest. Hence, the null hypothesis is not supported.

Research question no 2. Is there any significant difference between the achievement of Higher achievers who got and who did not get instructions in technology based learning environment according to their pretest and posttest results?

TABLE III
COMPARISON OF HIGH ACHIEVERS OF EXPERIMENTAL GROUP AND CONTROL GROUP ON PRETEST

Group	N	df	Mean	SD	SE _D	t-value
Experimental	3	2	33	1.7		
Control	3	2	32	2.5	1.2	0.491

$P > 0.05$; $df = 2$

Table 3 explains that the calculated value of $t = 0.491$ is less than the table value $= 2.78$ at $\alpha = .05$ level. It indicates that there is no significant difference between the mean scores of Higher achievers of Experimental group and Control group at the time of pre-test. Hence, the null hypothesis is supported.

TABLE IV
COMPARISON OF HIGH ACHIEVERS OF EXPERIMENTAL GROUP AND CONTROL GROUP ON POSTTEST

Group	N	df	Mean	SD	SE _D	t-value
Experimental	3	2	46	0.81		
Control	3	2	36	1.24	0.84	4.76

$P > 0.05$; $df = 2$

Table 4 explains that the calculated value of $t = 4.76$ is greater than the table value $= 2.78$ at $\alpha = .05$ level. It indicates that there is a significant difference between the mean scores of Higher achievers of Experimental group and Control group on posttest. Hence, the null hypothesis is not supported.

Research question no 3. Is there any significant difference between the achievement of Low achievers who got and who did not get instructions in technology based learning environment according to their pretest and posttest results?

TABLE V
COMPARISON OF LOW ACHIEVERS OF EXPERIMENTAL GROUP AND CONTROL GROUP ON PRETEST

Group	N	df	Mean	SD	SE _D	t-value
Experimental	3	2	14	1.25	1.43	0.465
Control	3	2	13	2.50		

$P > 0.05$; $df = 2$

Table 5 explains that the calculated value of $t = 0.465$ is less than the table value $= 2.78$ at $\alpha = .05$ level. It indicates that there is no significant difference between the mean scores of Low achievers of Experimental group and Control group at the time of pre-test. Hence, the null hypothesis is supported.

TABLE VI
COMPARISON OF LOW ACHIEVERS OF EXPERIMENTAL GROUP AND CONTROL GROUP ON POSTTEST

Group	N	df	Mean	SD	SE _D	t-value
Experimental	3	2	24	0.94	3.69	2.98
Control	3	2	13	6.39		

$P > 0.05$; $df = 2$

Table 6 explains that the calculated value of $t = 2.98$ is greater than the table value $= 2.78$ at $\alpha = .05$ level. It indicates that there is a significant difference between the mean scores of Low achievers of Experimental group and Control group on posttest. Hence, the null hypothesis is not supported.

VI. DISCUSSION AND CONCLUSION

The focus of the study was to determine the effectiveness of technology based learning environment in which instructions are imparted through Information and Communication Technologies (ICTs) and its impact on student achievement in English language. Results in pretest indicated that there was no significant difference between the achievement scores of the control group and the experimental group. It proves that the traditional teaching method does not enhance academic abilities of the students at desirable level. When compared with the results in posttest, it is clear that the students performed better when taught in technology based learning environment and it helps students develop the abilities of knowledge, comprehension and application as the items of achievement tests were based on these measures. Both the high achievers and low achievers of experimental group showed significant difference in the mean score of

achievement on posttest that suggests the effectiveness of Information and Communication Technologies in teaching-learning process as compared to traditional method. It is also evident that the existing methods of teaching English do not involve the usage and application of ICTs and it also shows that teachers are not trained in modern instructional techniques. Consequently, the students of experimental group showed significant better performance when compared with control group on scores of posttest.

VII. RECOMMENDATION

Following recommendations are presented for future strategies:

1. Technology based learning environment might be promoted and provided to enhance the achievement level of the students in English language
2. Computer laboratories with Internet, networking and other facilities of technology may be provided to improve the capability of teaching learning process.
3. Information and Communication Technologies (ICTs) as a subject may be introduced in schools and colleges.
4. Libraries play a vital role in teaching and learning process. To teach technology, on-line libraries may be introduced
5. Through the use of technology interest may be developed in the students who are slow learners.

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