Enhancing ESL Learners' Writing through Technology

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Abstract. Advances in the use of technology in language education over the last few decades have steered English language educators towards assessing various language learning opportunities. While the shift in the role of the language teacher from instructor to facilitator of students' learning could bring about a readjustment of existing pedagogies, it could also give rise to a completely new pedagogy with the efficient and effective incorporation of technology into language learning programs. The current study sets out to address this shift by integrating various technological affordances into a single program. More importantly, the immense effect that growing information and communication technologies could have, especially on writing, necessitates an inquiry into role that technology plays in enhancing writing. The study thereby investigates the effectiveness and usefulness of technology in enhancing ESL learners' writing skills at the tertiary level by administering a specifically designed language learning program.

Keywords: ICT, TELL, Language Enhancement, Writing Skills, e-Learning.

1. Introduction

The increasing use of technology in its varied forms in language education, via the Internet through multimedia learning, online learning, web-based learning, ICT, computer-mediated communication (CMC), and more recently technology-enhanced language learning (TELL), seems to have become a norm rather than an exception across various educational institutions. With directives from governments around the world, tertiary institutions, in particular, have been working towards the incorporation of information technology (IT) into language education. Applied linguists like Chapelle (2003a) have suggested that changes in information and communication technologies have expanded dramatically the options for English language learning and teaching, thereby heightening the need for teachers to evaluate the learning opportunities through technology. Warschauer (2007) particularly emphasizes the profound effect information technologies are having especially on written communication. Moreover, with the evolution of the process of writing from pen and paper to a computer screen, it has been noted that technology could function as an important tool for writing. Pennington (1996) explains that the computer technology functions not only as tool, but also as a partner in creation and recreation of knowledge. As a result, with the ever-increasing growth of technology in language learning environments, there is a growing need to examine various aspects involved in the adoption of technology, of which, the impact of the use of technology on conventional pedagogical approaches of language education, especially in writing, seems a significant one.

2. Background and Rationale

The development of sophisticated technology in recent years has brought about a shift in the discipline of applied linguistics - the shift in the role of the language teacher from instructor to facilitator of students' learning. A strand of research that has been noticed is the potential of information and communications technology to assist second language acquisition, based on contexts of traditional language teaching and learning in the classroom. As Schär and Krueger (2000) point out 'new technologies, when developed on the basis of cognitive, socio-linguistic or constructivist theories could provide 'limitless possibilities'. With respect to writing in particular, the novelty and innovation that technology brings along with it, may encourage second language learners to think of writing in English in new and positive ways as compared to writing in non-technology environments. It has been noted that for the non-native writer or for second language learners, the computer technology has become an especially valuable partner, as it promotes a simple writing process that spurs the language learner to a higher level of performance in writing

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(Pennington, 1996). Language education researchers have investigated of the role of different aspects of technology for development of writing skills. Studies like those of Beauvois (1998) examining the use of networking or computer-mediated communication for English writing skills have shown active learning through increased learner interaction. Sotillo's (2002) study shows the positive potential of the ubiquitous access to the language learning programs made available through wireless connectivity, Other studies include, positive attitudes towards individual features of developed programs such as interactivity and feedback (Bikowski and Kessler 2002), comprehension (Chen, Belkada, and Okamoto, 2004), and learner autonomy and responsibility of learning (Yan and Xiaoqing, 2009). As it can be seen, most studies on technology use in writing have been largely concerned with the use of any one particular aspect of technology. Nonetheless, there still remains a need to study the effectiveness of the varied aspects of technology incorporated into one single program. As pointed out by Barnes (1987), 'if language teaching is to put new technology to efficient use, there is a need for investing time on research and development, and in particular on the production and evaluation of suitable programs for students to work on'.

As development of new technologies gives rise to completely new ways of thinking and communicating, the potential of technology providing opportunities for language learning may lead to a readjustment of existing pedagogies, and in some cases, developing a completely new pedagogy. This in turn, could give rise to the principles in the design of a technology-enabled language learning program. Milton (2003) envisaged that an integrative design with online provision of language instructions and tools should support iterative stages of language exposure, review, practice and production, leading to communicative tasks. An integrative design would therefore help learners acquire relevant linguistic knowledge, skills and strategies by accessing comprehensible resources and tools of autonomous acquisition and relevant production. In other words, the design of the program or course should be coherent and planned while adhering to general cognitive learning principles by providing opportunities for self-discovery, problem solving, and collaboration. In other words, there has been a need for the production and evaluation of a suitable program, where language teaching could put various aspects of new technologies to efficient use.

On the basis of the potential of technology in facilitating language learning theories, the principles of designing TELL and the evaluation of the effectiveness of technology-enabled language programs, the current study researched what Chapelle (2003b) suggested as useful, in the sense that, the study provides evidence about the design of the technology-enabled language learning program and the learner's use of such a program. Moreover, this study integrated the various affordances made by technology into a single program and thereby, set out to test the effectiveness of such a program in enhancing particular language skills, in this case, writing skills of ESL learners at the tertiary level. Moreover, the study also investigated the usefulness of technology in enhancing the various components of writing such as unity and cohesion, logical arrangement of ideas in sentences, grammar and vocabulary, summary writing, and paragraph writing skills. In other words, the study evaluated a program developed for students to work on, in order to enhance their writing skills with the help of sophisticated e-learning technology.

3. Methodology

With need to address the research gap in terms of administering the usefulness and impact of a full-fledged technology-enabled program, the study embarked upon getting answers to the following questions:

- Can a technology-enabled language learning program be effective in enhancing writing skills of ESL learners at the tertiary level?
- Can a technology-enabled language learning program be effective in enhancing various sub-skills within the writing of ESL learners at the tertiary level?

In order to examine the effectiveness of the technology-enabled language enhancement program on the writing skills of ESL learners at the tertiary level, a research in a controlled context such as an experiment was required. The study used the one group pre-test post-test pre-experimental research design or the 'repeated measures' design in which the technology-enabled language enhancement program acted as the independent variable and the pre-test and post-test scores measuring the writing skills of students were the dependent variables Intact groups of subjects taught by the researcher were used. The participants constituted first-year university students who took the common English course, English for Communication II in the

second term of the academic year at Lingnan University in Hong Kong, as a required course on their degree programs. A total of 41 students participated in the study, of which twenty one were females and twenty were males within the age group of eighteen to twenty three years. Students belonged to various degree programs mainly classified into Business Administration majors and Arts or Social Sciences majors. Of these participants, twenty six participants were BBA majors and fifteen were Arts or Social Sciences majors. The native tongue of all the participants who were either from Hong Kong or Mainland China was Cantonese or Putonghua. Participants took the technology-enabled language enhancement program for written communication skills during the course of the semester for the writing section of the course over a period of ten weeks. Thus, the sample, that is, the participants for the present study were controlled in terms of belonging to an intact group and having a similar linguistic and educational background.

The technology-enabled language enhancement program was divided into 5 units of 6 hours each totaling to 30 hours. Each unit focused on a particular form of writing such as describing, reporting, experience sharing, summarizing, and expressing opinions or responding. Each unit also focused on specific language skills such as vocabulary, accuracy in grammar, unity and cohesion, and other soft skills such as comprehension, organization, planning, researching, and processing information. The units mostly followed a uniform structure which included a unit introduction, a warm-up task 1, a warm-up task 2, a discussion forum, a set of activities such as fill-in-the-blanks, error correction, formation of sentences, etc. related to the unit, a guided writing section; and finally, a main task constituting a free writing section based on the type and form of writing described in the unit with the specified language focus. Since each form of writing was unique, and could not be prioritized over the others, the units did not follow any particular hierarchal level of difficulty. Nonetheless, as each unit progressed, the level, number, and complexity of skills to be used for an activity kept increasing. The units also followed a progression in the activities from controlled writing to guided writing to free writing. All activities in each unit involved sharing and exchanging of ideas and information among peers. The submission of tasks varied in terms of the number of people involved in the task submissions. Units entailed submission of tasks which involved individual work or pair-work or group-work. The 30 hour program was administered over a period of ten weeks. The entire writing program was administered in an online teaching and learning environment via the e-learning platform WebCT Campus Edition 8 (WebCT CE8). Several online materials and resources available on the Internet were used. The materials varied in several forms ranging from resources containing textual input, auditory input, and visual input, to a combination of all the three, in the form of news reports, audio interviews, video links, and various web sites. The entire processing of information was done via online e-learning technology. The process involved in the pedagogy incorporated the following steps:

- logging onto the e-learning platform;
- accessing the program;
- reading and understanding the materials, tasks, and instructions online;
- researching and evaluating online materials;
- processing information by checking online dictionaries, thesaurus, or any other online web sources;
- conducting peer-reviews, evaluations and giving feedback online;
- interacting with group members online via email or discussion or chat forums;
- using a word processor to type, revise, edit, proof-read tasks via a word processor; and
- submitting the required tasks electronically

The significant instruments used for the data collection, the pre-test and post-test administered at the beginning and end of the experiment respectively measured various aspects of the written language in terms of logical sequencing of ideas, grammar and accuracy, unity and cohesion, comprehension of ideas with vocabulary, summary writing, and paragraph writing. The 45-item test was divided into logical arrangement of sentences, error-correction, fill-in-the- blank exercises, multiple-choice responses, matching exercises, and free writing in the form of summary and paragraph writing. The responses to the test items for logical sequencing of ideas, error-correction, gap-fill exercises, multiple-choice responses, and matching exercises were measured against a set mark for each while the free writing for the summary and paragraph responses were measured against a specially constructed rubric that contained multi-leveled criteria for evaluating various aspects of writing such as content, organization, development of ideas and language use.

4. Data Analysis

4.1. Differences in Overall Pre-test and Post-test Scores

The data collected from the pre-test and post-test scores was first computed for a descriptive statistical analysis before any subsequent analysis. Details collected from the test scores revealed that the overall mean of the pre-test was 34.07 and the standard deviation was 7.05. The overall mean of the post-test was 39.42 and the standard deviation was 5.07. The mean of the paired difference of 5.35366 suggested that the overall average score of the post-test was high compared to the pre-test score. In addition, to the analysis of the pre-test and post-tests scores with respect to the means and standard deviation, a correlation analysis of the pre-tests and post-tests was also conducted. The details of the correlation analysis revealed a significant value of correlation of 0.548 with a significance of 0.000. This showed that the overall scores of the pre-test and post-test were highly correlated. In order to obtain details of overall differences in the pre-test and post-test scores for the students who underwent the technology-enabled language enhancement program to develop written communication skills, a T-test analysis was carried out.

Table 1: Paired T-test for overall score

Paired Differences								
	Mean	**Std. Deviation**	**Std. Error Mean**	**95% Confidence Interval of the Difference**				
Overall Post-Test Score - Pre-Test Score				**Lower**	**Upper**	**T**	**Df**	**Sig. (2-tailed)**
	5.35366	6.02001	0.94017	3.45351	7.25381	5.694	40	0.000

The T-value obtained from the analysis of the overall mean scores of the pre-test and the post-test was 5.694 with a P-value or value of significance of 0.000, at the level of 0.05. This meant that there was a significant difference between the overall mean scores of the pre-test and post-test at 5% level of significance.

4.2. Differences in Various Components of the Pre-test and Post-test Scores

In addition to the descriptive analysis of the scores for the pre-test and post-test for the study, a descriptive analysis of the various components of the tests was also carried out. The six major components of tests included logical arrangement of sentences, grammar and error correction, unity and cohesion, reading comprehension and vocabulary, summary writing, and paragraph writing. Details collected for the analysis included descriptive statistics on the differences in the overall mean scores of the various components of the pre-test and post-test, in which differences were noted. An ANOVA was carried out to obtain details of overall differences among various components of the pre-test and post-test scores for the students who underwent the technology-enabled language enhancement program to develop written communication skills.

Table 2: ANOVA for various test components

	Sum of Squares	**Df**	**Mean Square**	**F**	**Sig.**
Between Groups	149.042	5	29.808	4.647	0.000
Within Groups	1,539.35	240	6.414		
Total	1,688.40	245			

The F-value obtained from the analysis of the overall mean scores of the pre-test and the post-test was 4.647 with a P-value of 0.000, at the level of 0.05 meant that there was a significant difference among overall means scores of various components of the pre-test and post-test at 5% level of significance.

4.3. Analysis with Respect to Gender and Program Major

4.3.1. Overall scores

In addition to examining the effectiveness of the technology-enabled language enhancement program in developing overall as well as various components of written communication skills of ESL at tertiary level, the study also examined if the technology-enabled program was equally effective among male and female participants as well as among various disciplines and that, if factors such as gender and choice of academic discipline or program major could be attributed to the differences of the scores achievement.

Details collected from the test scores for both male and female participants showed the difference in the means score of the pre-test and post-test for males, was 5.65 and for females was 5.07. An analysis of pre-test and post-test scores in relation to gender showed that the P-value corresponding to the F-test of equal variances assumed is 0.022 which was less than 0.05. This suggested that the independent two sample T-test with unequal variance should be used to compare the mean scores. The P-value of t-test with unequal variance of 0.766, which was greater than 0.05, meant that there was no significance difference in mean score of pre-test and post-test with respect to gender at 5% level of significance.

Moreover, an investigation of whether the technology-enabled language enhancement program was effective among various academic disciplines of the study was carried out. Details collected from the test scores revealed that the difference in the means score of the pre-test and post-test for BBA majors was 4.50 and that of the Arts and Social Sciences majors was 6.83. The T-test analysis in relation to degree program major showed that the P-value of 0.589 which was greater than 0.05. This finding therefore suggested that there was no significance difference in mean score of pre-test and post-test with respect to degree program major at 5% level of significance.

The results indicated that there was no significant difference to be found in the mean scores of the pre-test and the post-test with respect to gender as well as the choice of degree program major.

Table 3: Differences in overall scores in relation to gender and program major

	Levene's Test for Equality of Variances		T-test for Equality of Means					95% Confidence Interval of the Difference	
	F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
Gender									
Equal variances assumed	5.699	0.022	0.304	39	0.763	0.57857	1.9026	-3.26981	4.42695
Equal variances not assumed			0.3	30.072	0.766	0.57857	1.92661	-3.35569	4.51283
Program Major									
Equal variances assumed	0.297	0.589	-1.202	39	0.237	-2.33333	1.94113	-6.25964	1.59298
Equal variances not assumed			-1.123	23.85	0.273	-2.33333	2.07763	-6.62277	1.9561

4.3.2. Scores of various components

In addition to finding differences in overall scores, an analysis of a further breakdown of scores of various components of writing skills among male and female participants and among participants of different program majors was also carried out. An ANOVA was used to obtain details of these differences.

The F-value obtained from the analysis of the mean scores of the pre-test and the post-test for males was 2.781 with a P-value of 0.021 and for females was 3.406 with a P-value of 0.007. This meant that there was a significant difference among means scores of various components of the pre-test and post-test for both male and female participants.

Moreover, an analysis of scores of various components of writing skills, that is, the BBA and Arts or Social Sciences majors was also carried out. An ANOVA was used to obtain details of these differences. The F-value obtained from the analysis of the mean scores of the pre-test and the post-test for BBA majors was 4.003 with the P-value of 0.002 and for Arts or Social Sciences majors was 1.241 with the P-value of

0.297. Thus, the significant differences were found in the means scores for various components of the pre-test and the post-test for the BBA majors but, since the P-value for Arts or Social Sciences majors was more than 0.05, no significant differences was found in the means scores for various components of the pre-test and the post-test for the Arts or Social Sciences majors.

Table 4: ANOVA for various test components in relation to gender and program major

Gender		Sum of Squares	df	Mean Square	F	Sig.
Male	Between Groups	99	5	19.823	2.781	0.021
	Within Groups	812	114	7.127		
	Total	912	119			
Female	Between Groups	96.47	5	19.294	3.406	0.007
	Within Groups	679.762	120	5.665		
	Total	776.232	125			
Program						
BBA	Between Groups	119.115	5	23.823	4.003	0.002
	Within Groups	892.76	150	5.952		
	Total	1011.875	155			
Arts or Social Sciences	Between Groups	45.947	5	9.189	1.241	0.297
	Within Groups	621.942	84	7.404		
	Total	667.889	89			

5. Findings

While the first finding from the analysis could establish that there was a significant difference between the overall mean scores on the pre-test and post-test of the students, the second finding from the analysis could establish that there were significant differences in scores even among various components of writing skills of the students. Thus, the findings could determine that the significant differences found in the overall means scores of the pre-test and the post-test as well as those for various components were not due to chance but due to the treatment, that is, due to the technology-enabled language enhancement program. In other words, the evaluation of the results on the participants' performance through the test scores suggested that the technology-enabled language enhancement program was effective in enhancing not only the overall writing skills of ESL learners at the tertiary level, but also the various components or sub-skills involved in writing.

Moreover, other significant findings determined that the program was equally effective on male participants as well as female participants, and various program majors. Most importantly, the analysis also confirmed that the significant difference could not be attributed to any other factor such as gender or choice of program major, but due to the program itself.

Finally, a closer examination of the mean scores of the various components showed significant difference for BBA majors but, but did not show any significant difference for Arts or Social Sciences majors. A possible explanation for this could be the academic needs of a particular discipline and the timing of the administering of the technology-enabled language enhancement program. The Arts or Social Sciences participants would have chosen majors in History, Philosophy, Cultural Studies, Visual Studies, or Translation Studies, Economics, or Political Sciences. The nature of assignments or assessments for participants from these majors usually would be in the form of 5000 to 8000-word written essays or reports where considerable amount of writing skills are required. On the other hand, the nature of assignments or assessments for the Business Administration majors is usually group or individual presentations where the speaking skills are used. The amount of writing done by these participants would therefore be lesser when compared to the Arts or Social Sciences majors. The time when technology – enabled language enhancement program was administered, the majors from Arts or Social Sciences had already come in with an experience

of a semester of utilizing various writing skills for their assignments or assessments. However, the Business majors had come in with very little experience of using writing skills for their assignments or assessments. Thus, while the program may have been equally effective on participants from different majors, the differences in various components of writing skills could be seen for the Business majors. This finding re-affirmed the effectiveness of the program in terms of enhancing writing skills.

6. Conclusion

With the foundation of theory, pedagogy, and tasks-based teaching and learning, the effectiveness and evaluation of the program through this study could prove useful in the design and implementation of future technology-enabled language programs based on substantial language learning theories and sound pedagogical principles. As the findings from the analysis of the results on the participants' performance through the test scores showed, the writing skills of ESL learners at the tertiary level could be enhanced via the administering of the suitable technology-enriched language program. Language programs could be therefore be designed and structured around features endorsed by researchers and most importantly features that could be easily offered by technology. Features such as easy accessibility, easy usability, a degree of autonomy, resource variety, authenticity, cognitive familiarity, sharing, interaction, and opportunities for self-improvement provided by technology could be collectively incorporated into the language program designs. Consequently, the design and development of language programs with the optimum utilisation of the affordances made by technology could prove effective in enhancing language skills of the learners.

7. References

[1] P. Barnes. The Organisation of language teaching at tertiary level. In: R. Lord and H.N.L. Cheng (eds.), *Language education in Hong Kong Hong Kong*: Chinese University Press, 1987, 141-153.

[2] M. H. Beauvois. Conversations in slow motion: computer-mediated communication in the foreign language classroom. *The Canadian Modern Language Review*. 1998, 54(2), 198–217.

[3] D. Bikowski and G. Kessler. Making the Most of Discussion Boards in the ESL Classroom *TESOL Journal.* 2002, 11(3), 27-30.

[4] C. Chapelle. English language learning and technology: Lectures on applied linguistics in the age of information and communication technology. Amsterdam ; Philadelphia: 2003a, John Benjamins Pub.

[5] C. Chapelle. Evaluation of IT and multimedia: Exploring the teacher's role. In B. Morrison, C. Green, and G. Motteram (Eds.), *Directions in CALL: Experience, experiments and evaluation*. 2003b, Hong Kong: English Language Centre, The Hong Kong Polytechnic University.

[6] J. Chen, S. Belkada, and T. Okamoto. How a web-based course facilitates acquisition of English for academic purposes. *Language Learning & Technology*. 2004, 8(2), 33-49.

[7] J. S. Greany. Student Perceptions on Language Learning in a Technological Environment: Implications for the New Millennium, *Language Learning and Technology*. 2002, 6 (1), 165-180.

[8] J. Milton. Designing principles of an online EFL course. In B. Morrison, C. Green, and G. Motteram, (eds.), *Directions in CALL: Experience, experiments and evaluation*. 2003, Hong Kong: English Language Centre, The Hong Kong Polytechnic University.

[9] M.C. Pennington. The computer and the non-native writer: A natural partnership. 1996, Cresskill, NJ: Hampton Press.

[10] S. G. Schär and H. Krueger. Using new learning technologies with multimedia. *IEEE Multimedia*. 2000, 8(3), 40-51

[11] S. M. Sotillo. Constructivist and collaborative learning in a wireless environment. *TESOL Journal.* 2002, 11 (3), 16-20.

[12] M. Warschauer. Technology and writing. *International handbook of English language teaching*. 2007, Springer US, 907-917.

[13] G. Yan and Q. Xiaoqing. Chinese College English Learners' Attitudes and Behaviors in Computer-Assisted Autonomous Language Learning. The Journal of ASIA TEFL 2009, 6(2), 207-231.