

TECHNOLOGY AND L2 LEARNING: HYBRIDIZING THE CURRICULUM

Kyria R. FINARDI
Universidade Federal do Espírito Santo

RESUMO: Ainda que a tecnologia venha sendo utilizada na sala de aula por algum tempo, pouca pesquisa sobre seus efeitos no aprendizado de L2 existe. Este artigo tem como finalidade suprir essa lacuna reportando brevemente quatro estudos sobre o uso de tecnologia no contexto de ensino e aprendizado de L2. O primeiro estudo (OLIVEIRA, 2012) analisou o uso do livro digital no ensino de inglês através dos conceitos de multiletramento e tecnologia da informação analisando percepções de alunos sobre o uso dessa tecnologia. Os resultados do estudo mostraram que o livro digital foi considerado uma ferramenta valiosa no aprendizado de L2. O segundo estudo (WEISSHEIMER, 2012) analisou o impacto do *Voicethread* – uma ferramenta da rede para a prática oral colaborativa – sobre o desenvolvimento da fala em L2 e concluiu que os alunos que utilizaram essa ferramenta fizeram mais uso de planejamento, comparação e repetição de fala em L2 melhorando, como consequência, sua fluência e acurácia na fala em L2. O terceiro estudo (PREBIANCA; SANTOS JUNIOR, 2012) analisou um software educacional através de critérios criados com base na Teoria da Modificabilidade Cognitiva Estrutural concluindo que os recursos usados pelo software estavam adequados aos critérios ergonômicos fazendo com que o programa fosse considerado uma ferramenta de apoio relevante. O quarto estudo (CARDOSO; MOTA, 2012) analisou o impacto de CALL na aquisição de vocabulário em L2. Resultados preliminares do estudo mostraram um aprendizado de vocabulário significativo nesse contexto, sugerindo que CALL seja incorporado aos cursos de inglês para fins específicos/instrumental.

PALAVRAS-CHAVE: Tecnologia; aprendizado de L2; hibridizando o currículo

ABSTRACT: *Though technology has been used in the classroom for some time now, research on its effects on L2 learning is still scant. This paper aims at filling in this gap by briefly reporting on four pieces of research carried out to unveil different possibilities for the use of technology in the context of L2 learning. The first study (OLIVEIRA, 2012) looked at the use of the digital book in ELT using the concepts of multiliteracy and information technology to answer the main research question of what students' perceptions on the digital book were. Results of the study showed that the digital book was considered a valuable tool for L2 learning. The second study (WEISSHEIMER, 2012) looked at the impact of Voicethread – a web tool for online collaborative oral practice - on the development of learners' L2 speaking and found that voicethread engaged learners in planning, comparison and repetition of L2 speaking which, in turn, improved L2 speaking in terms of fluency and accuracy. The third study (PREBIANCA; SANTOS JUNIOR, 2012) analyzed an educational software based on the Theory of Structural Cognitive Modifiability and found that overall the resources used by the software met the ergonomic criteria set and the software proved to be a relevant support tool. The fourth study (CARDOSO; MOTA, 2012) analyzed the impact of CALL on the acquisition of L2 vocabulary and preliminary results showed that there was a significant amount of vocabulary acquisition suggesting that CALL could and should be incorporated in ESP courses.*

KEYWORDS: *Technology; L2 learning; hybridizing the curriculum*

Introduction

The 2011 Report of the Internet Management Committee in Brazil on the use of Information Technology in public schools (www.cgi.br) revealed that primary schools have an average of 23 computers whereas secondary schools have 27 computers depending on the region. The National Program for Computers in Education – Proinfo released an official report according to which 100 thousand computer labs were acquired for public schools since 2004. Official reports also show that many schools are equipped with the digital board and interactive television making information technology gradually more available in the public school system in Brazil.

Reis (2009) reminds us that schools are responsible for preparing people for life and so teachers can no longer ignore the reality of a society which evolves with the technological advancements. Being literate (able to read and write text) in the 21st century is not enough, individuals who are prepared to act in a globalized world are those who are digitally literate, that is, those who can read beyond the codes making connections outside the written text (XAVIER, 2009).

According to Eshet-Alkali and Amichai-Hamburger (2004) digital literacy requires more than just the ability to use software or to operate a digital device and includes a variety of complex skills. A conceptual model recently described by the authors suggests that digital literacy comprises five major digital skills: photo-visual skills (“reading” instructions from graphical displays), reproduction skills (utilizing digital reproduction to create new, meaningful materials from preexisting ones), branching skills (constructing knowledge from non-linear, hypertextual navigation), information skills (evaluating the quality and validity of information), and socio-emotional skills (understanding the “rules” that prevail in cyberspace and applying this understanding in online cyberspace communication).

Despite the increasing need to form digitally prepared individuals on the one hand, and the gradually increasing availability of internet and information technology resources, on the other, results of reports on national levels of education in Brazil show that the availability of technology in itself is no guarantee of quality education. So as to guarantee better results in education, more teacher training is needed to equip teachers with the necessary resources to use technology in a critical way. Another step that must be considered in the improvement of education with the use of technology is research on the impact of certain technologies on learning.

In the realm of L2 teaching, technology has been used for some time now (MENEZES, 2012, personal communication). Nevertheless, studies on the impact of different pieces of technologies in the process of L2 learning are still in their infancy. The present study aims at filling in this gap by contributing with a review of four studies carried out in Brazil on the impact of different pieces of technology on different aspects of L2 (English) learning. What these studies have in common is that they were conducted in public universities in Brazil and all concluded that the best approach to use technology in L2 is to use a mixture of teacher led classes and computer assisted and online resources in a blended or hybrid learning environment. In what follows the four studies will be briefly described in the same sequence they were presented in the 2012 edition of the Abrapui congress in the coordinate session entitled Technology and L2 Learning: Hybridizing the Curriculum.

Study 1 – Multiliteracies, Information Ecology and the Digital book: EFL Students’ Perception of Technology

The first study (OLIVEIRA, 2012) departed from the observation that although the digital book had been in the market for six years, little had been discussed regarding its effect in the English (L2) classroom. Using the concepts of multiliteracies and information ecology, the study discussed the effect of the digital book on L2 learning through the perspective of students.

The study is based on the theoretical assumption that while literacy focuses on the use of text only, multiliteracy (NEW LONDONG GROUP, 1996) concentrates on broader than language modes of representation which differ according to culture and context, and have specific cognitive, cultural, and social effects. Information ecology is defined as a system of people, practices, values, and technologies in a particular environment (NARDI; O'DAY, 1999, p.49).

The focus of the study was not on technology per se, but rather on human activities served by it and attempted to answer the following research questions: a) Do students enjoy the use of the digital book in class? b) Does the digital book make any difference in their motivation/class participation? c) Does the digital book have any impact in their learning?

Data were collected through a questionnaire applied to thirty students enrolled in the third semester of English at a public university. The first question attempted to determine whether students enjoyed the digital book and found that students liked not only the digital book but also this type of material. The second question tackled motivation and class participation in relation to the use of the digital book and found that students felt more motivated to participate in the lessons because they found lessons more interactive with the digital book. The third question regarded the impact of the digital book on students' learning and found that the digital book had a positive impact on learning and enhanced, in particular, visual forms of learning.

The study concluded that the digital book was a highly valuable learning tool that helped students to participate more in class and focus on what was being taught. In addition, students agreed that classes became more interactive and that images and sound were important in their learning process. Since some participants reported that the most important factor in students' learning was the teacher, the author reminded us of Blake's (2008) prediction that technology would not replace teachers, but teachers who knew how to use technology would be replaced by those who did not and concluded that the best approach to L2 teaching was to use a mixture of teacher led and technology enabled lessons. Finally, the author recommended caution in interpreting results of the study due to the small number of participants.

Study 2 – Technology-enhance L2 Learning: the impact of Voicethread on learners' speaking

The second study (WEISSHEIMER, 2012) investigated the impact of a web 2.0 tool – Voicethread – on learners' L2 speaking development in terms of fluency and accuracy. The study is based on Blake's (2011) observation that students who took part in online courses outperformed those who took part in purely face-to-face traditional courses and in turn, those who took part in hybrid or blended environments (online and face-to-face) outperformed those who took part in only online courses. Thus the study used a blended environment where the teacher interacted with students in a traditional face-to-face class and students interacted with the Voicethread tool at home.

Voicethread is an asynchronous web tool available for online collaborative oral practice which allows users to plan, listen to and repeat their speech before saving a definite version of their thread to be posted on a voice forum. Learners can also compare their speech samples with those produced and saved by other (more or less proficient) speakers.

The study is based on three assumptions about the development of L2 speech. The first assumption is that planning and rehearsing speech helps L2 speech development (MEHNERT, 1998; GUARÁ TAVARES, 2008; 2009; D'ELY; TUMOLO, 2011). The second assumption is related to the Output Hypothesis (SWAIN, 1995) which claims that production (in this case of L2 speech) is a necessary condition for L2 speech development. Finally, the third assumption is based on the Noticing Hypothesis (SCHMIDT, 1995) which claims that noticing is another necessary condition for learning to take place. According to these assumptions, the voicethread tool would be a relevant interface to enhance L2 speech development since it allows learners to plan, produce and notice gaps and forms in L2 speech strings.

In order to investigate the impact of the Voicethread tool on learners L2 speech development, the first and last voicethread samples of twenty-six students of English enrolled in an English course at a Federal University were collected, transcribed and analyzed in terms of fluency (speech rate measured in terms of the number of words per minute) and accuracy (indexed as the number of errors per 100 words).

The data showed that learners' speaking scores improved significantly across the semester. Results were interpreted as evidence that technology-enhanced speaking practice – in this case with the Voicethread tool– engaged learners in planning, comparison and repetition. Moreover, the study suggested that these processes served as catalysts of learners' speech production (D'ELY, 2006; GUARÁ TAVARES, 2008; 2009). The discussion also tackled the role of output in language learning as a means of noticing one's gaps in oral performance (SWAIN, 1995). The author concluded that the hybrid environment of the study made up of face-to-face classes with speaking tasks and learners' practice and interaction with the Voicethread tool at home were conducive of L2 speech development in terms of fluency and accuracy.

Study 3 – Learning English Through Educational Softwares: insights from the Theory of Structural Cognitive Modifiability and Human-Computer Interaction

The third study (PREBIANCA; SANTOS JUNIOR, 2012) was blended in many ways, starting from the authors that came from different research traditions. The first author, Gicele Prebianca, is an English professor and does research in the Applied Linguistics area. The second researcher, Vital Santos Junior, is a technology professor and does research on ergonomics and different aspects of information technology.

Prebianca and Santos Junior's study aimed at analyzing an educational software from the perspective of the theory of Structural Cognitive Modifiability and Human-Computer Interaction. The authors claim that so as to make theoretically-based decisions about the teaching tools used in class, teachers should consider the impact such tools might have on the learning process.

The study analyzed the characteristics of an educational software designed to teach English as a foreign language to beginners. Three instruments of evaluation adapted by

Gomes (2001 *apud* PREBIANCA; SANTOS JUNIOR, 2012) were used in order to tackle (i) the interaction between the software and the learner; (ii) the cognitive/mental operations learners need to undergo in order to perform the tasks required by the software and (iii) the pedagogical strategies implemented by the software.

Human-Computer Interaction (HCI) aspects of the software were also analyzed to determine the degree of interactiveness and usability of the tool (ERGOLIST, 2011). The study is based on the assumption that learning can be seen as the modification of cognitive/mental structures through mediated learning experiences (FEURSTEIN, 1994; 1997).

According to the theory of Structural Cognitive Modifiability the three main features for an interaction to be considered a mediated learning experience are its intentionality, transcendence and meaning. According to the theory of Human-Computer Interaction ergonomics is part of a software and its aim is to facilitate understanding of the system taking into consideration the user's adaptability to it. This theory attempts to understand how the user interprets computer systems so as to propose high quality interfaces based on the feedback (BARBOSA; SILVA, 2010).

Prebianca and Santos Junior's study aimed at analyzing the validity of an educational software to teach English as an L2 to beginners assessing aspects of interaction between the software and the learner, investigating the cognitive/mental operations learners undergo to perform the tasks required by the software and investigating the pedagogical strategies implemented by the software evaluating Human-Computer Interaction (HCI) aspects of the software so as to determine its degree of interactiveness and usability.

The software analyzed was the Interchange Arcade by Cambridge University Press and the instrument of data collection was a set of criteria adapted from Gomes (2011 *apud* PREBIANCA; SANTOS JUNIOR, 2012) and given to three raters who were asked to rate the set of criteria based on a scale designed to evaluate how well each criterion was implemented by the software.

The study suggests that the software, as a pedagogical tool to promote L2 learning must consider the following aspects: the importance of piloting, the concern for the underlying mental processes involved in the performance of the tasks; detailed feedbacks to lead to the development of learners' metacognitive and strategic behavior, which in turn, may lead to cognitive modifiability.

Results of the ergonomic analysis suggest that the software was efficient since it provided feedback in terms of waiting time to upload photos and images or other information related to the exercises, the icons were easy to understand and the software distributed icons, images and other information in an efficient manner in the screen. The ergonomic analysis also concluded that the informational density of the software was good, requiring minimal actions; the software waits until the learner makes the necessary entries to correct (explicit actions). Finally, the ergonomic criteria also analyzed the user's control, flexibility and experience and concluded that in general the resources used by the software meet most ergonomic criteria suggesting the software is a relevant support tool for L2 learning.

The study suggested the software could be improved by providing more feedback in terms of information about reasons for errors and a report or statistics about performance in

the end of each unit. Finally, in line with the other studies described in this paper, Prebianca and Santos Junior suggest that blending environments and tools are conducive for learning just as using different analysis perspectives (such as including language raters and computer analyst raters) sheds more light on aspects that affect learning.

Study 4 - Integrating CALL and vocabulary acquisition in an ESP course: an exploratory study

The fourth study (CARDOSO; MOTA, 2012), is part of a larger research endeavour (CARDOSO; MOTA, 2012) and aimed at investigating the impact of Computer Assisted Language Learning (CALL) on the acquisition of new vocabulary in English (L2) by analyzing the reactions and attitudes of English for Specific Purposes (ESP) students towards the use of CALL activities. Twenty-four students enrolled in a Basic Computing technical course (age range 15-48) were the participants of the study which used a mixed methods design (DORNYEI, 2007) analyzing the data both qualitatively and quantitatively.

Preliminary findings of the qualitative analysis of online questionnaires, oral interviews, and students' posts in forums at the MOODLE platform (the virtual learning environment of the course) show that the effects of CALL are positive. Students reported enjoying the opportunity of performing activities on the MOODLE platform and added that having immediate access to online dictionaries and search sites helped the learning process and added that the traditional paper-and-pen activities were also important in the process.

Preliminary findings of the quantitative analysis of the paper-and-pen pretest, immediate posttest and delayed posttest and the computer-mediated immediate posttest and delayed posttest performed through the MOODLE platform revealed that there was a statistically significant amount of acquisition of new vocabulary in the computer-mediated posttests as well as in the paper-and-pen posttests.

The authors conclude that results of their study corroborate Celani's (2008) suggestion that ESP courses do not need to be connected to the teaching of the reading skill only, instead, ESP courses can and should incorporate CALL activities so as to allow the development of students' digital literacy as well as other skills. The study concluded with the suggestion that not only CALL activities should be employed for the L2 teaching, but also, traditional paper-and-pen activities in a blended or hybrid approach to L2 teaching and learning.

Conclusion

The four studies reviewed in this paper were grouped in the same coordinated session of the 2012 edition of the Abrapui Congress for a reason. They all attempted to shed light on aspects of technology that might affect L2 learning and suggested the use of hybridism in terms of learning environment, methodological procedures and perspectives. The first study (OLIVEIRA, 2012) suggested the digital book should be used in tandem with face-to-face teacher led classes. In the same line, the second study (WEISSHEIMER, 2012) suggested that Voicethread should be blended with teacher led traditional classes. The third study (PREBIANCA; SANTOS JUNIOR, 2012) was even more radically blended in the sense that it mixed research traditions and perspectives (computer and

applied linguistics) to analyze an educational software through the eyes of ergonomics and L2 pedagogy. Finally, the fourth study (CARDOSO; MOTA, 2012) also suggested a blended modality of L2 teaching by showing the impact of the use of CALL and traditional classes to enhance L2 learning and suggested that CALL should be incorporated in ESP courses so as to allow the development of other skills (apart from reading). All in all, what we see in the end of the day is that hybridizing the curriculum still seems to be the best option but how to mix it requires critical selection based on research so as to enable teachers and curriculum designers to make informed decisions when it comes to using technology in L2 learning.

References

BARBOSA,S.; SILVA, B. **Interação Humano-Computador**. Série SBC, Campus-Elsevier, 2010.

BLAKE. R. J. **Brave new digital classroom: technology and foreign language learning**. Washington D.C.: Georgetown University Press, 2008.

BLAKE.R.J. Current Trends in Online Learning. **Annual Review of Applied Linguistics**, 31, 19-35, 2011.

CARROLL, J. **Human Computer Interaction (HCI)**, Interaction-Design.org, 2009 . Available at: http://www.interaction-design.org/encyclopedia/human_computer_interaction_hci.html>. Accessed on: 05 February 2012.

CARDOSO, G. L.; MOTA, M. B. **Integrating CALL and Vocabulary Acquisition in an ESP Course: An exploratory study**. In: III Congresso Internacional da Abrapui. Florianópolis, UFSC, 2012.

CELANI, M. When the myth and reality meet: Reflections on ESP in Brazil. **English for Specific Purposes**. V.27, p. 412-423. 2008.

D'ELY, R. **A focus on four metacognitive processes: the impact of strategic planning, repetition, strategic planning plus repetition, and strategic planning for repetition on L2 oral performance**. Florianópolis, 2006.

D'ELY, R.; TUMOLO, C. The impact of the familiarity with the strategic planning and teacher led planning on learners' L2 oral performance of focused and unfocused tasks. Advanced Research in English Series, C761, **Contextualized Practices in English as a Foreign Language Teaching and Assessment**. Florianópolis, v.1, p.99-152, 2011.

DORNYEI, Z. **Research Methods in Applied Linguistics**: Oxford University Press. 2007.

ERGOLIST. Ergolist, 2011. Available at: <http://www.labiutil.inf.ufsc.br/ergolist/index.html>>. Accessed on 24 Feb. 2012.

ESHET-ALKALI, Y.; AMICHAH-HAMBURGER, Y. Experiments in Digital Literacy, **CyberPsychology & Behavior**, 7 (4), 421-429, 2004.

FEUERSTEIN, R.; FEUERSTEIN, S. Mediated Learning Experience: a theoretical review. In: **Mediated Learning Experience (MLE): theoretical, psychosocial and learning implications**. London: Freund Publishing House Ltd., 1994. p. 3-51.

FEUERSTEIN, R. Teoria de la modificabilidad cognitiva estructural. In: **Es modificable la inteligencia?** Madrid: Bruño, 1997. p. 11-23.

GUARÁ TAVARES, M.G. **Pre-task planning, working memory capacity, and L2 speech performance**. Florianópolis, 2008.

GUARÁ TAVARES, M.G. The relationship among pre-task planning, working memory and L2 speech production: a pilot study. **Linguagem & Ensino** (UcPel), v.12, p.165-194, 2009.

MEHNERT, U. The effects of different lengths of time for planning on second language performance. **Studies in Second Language Acquisition**, 20, 83-108, 1998.

MENEZES, V. **Web2 tools 4 EFL classroom and beyond**. In: III Congresso Internacional da Abrapui. Florianópolis, UFSC, 2012.

NARDI, B. A.; O'DAY, V. L. **Information ecologies: using technology with heart**. Cambridge, MA: The MIT Press, 1999.

NEW LONDON GROUP. A Pedagogy of Multiliteracies: Designing Social Futures. **Harvard Educational Review**, v. 66, n. 1, p. 60-92, 1996.

OLIVEIRA, A. **Multiliteracies, Information Ecology and the Digital Book: EFL students' view of Technology**. In: III Congresso Internacional da Abrapui. Florianópolis, UFSC, 2012.

PREBIANCA, G.; SANTOS JUNIOR, V. **Learning English through educational softwares: insights from the Theory of Structural Cognitive Modifiability and Human-Computer Interaction**. In: III Congresso Internacional da Abrapui. Florianópolis, UFSC, 2012.

REIS, F. O e-mail e o blog: interação e possibilidades pedagógicas. In: Araújo, J.C.; DIEB, M. **Letramentos na Web**. Fortaleza: Edições UFC, 2009, p.99-110.

SWAIN, M. The functions of output in second language learning. In Cook, G. and Steidhofer, B. (Eds.), **Principle and Practice in Applied Linguistics**. Studies in Honor of H.G. Widdowson, pp.125-144, Oxford University Press, 1995.

SCHMIDT, R. Consciousness and foreign language learning. A tutorial on attention and awareness in learning. In Schmidt, Ed., **Attention and Awareness in Foreign Language Learning** (pp.1-63), Honolulu, HI: University of Hawai, National Language Resource Center, 1995.

WEISSHEIMER, J. **Technology-enhanced L2 learning: the impact of voicethread on the development of learners' L2 speaking**. In: III Congresso Internacional da Abrapui. Florianópolis, UFSC, 2012.

XAVIER, A. C. S. **Letramento digital e ensino**. Available at <http://www.ufpe.br/nehete/artigos/Letramento%20digital%20ensino.pdf> – accessed 03/12/2009.