Using Emergent Technologies for Enhancing Life Long Learning (LLL) in General, and Second Language Acquisition (SLA) in Particular

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Abstract

The main purpose of this paper is to explore the significance of emerging technologies for enhancing life long learning (LLL) in general, and second language acquisition (SLA) in particular. We begin by highlighting the characteristics of the new Interaction Age that suggest a shift in the creation, usage and applications of digital content. We review a set of technologies and trends, such as Virtual Learning Environments, Intelligent Tutoring Systems, Google Applications, Virtual Reality, and Ubiquitous Learning using mobile devices. These technologies are among those at the leading edge of innovation and hold promise for the future of learning. We also argue that these technologies must enhance communication through engagement and interaction in the increasing use of internet and eLearning in our lives.

Introduction

With the beginning of this new century eLearning has emerged as a new technology for delivering online, hybrid, and synchronous learning regardless of geographical location, time of day, or digital reception or devices in use today. This paper includes a brief discussion of reasons why the educational and civil society institutions and enterprises are turning to eLearning to engage learners with new ideas and new knowledge.

According to two researchers Jennifer M. Brill and Yeonjeong Park (2008) working at Virginia Tech, USA the application of a variety of technologies for learning and teaching is being influenced by two significant forces: the realm of technological innovation (especially, today, in regard to hardware and software, including new Learning Management Systems (LMSs), and the realm of learning theory. In consideration of the real technological innovation, learning has evolved from textbooks to television to computers, and now to mobile digital devices, in a relatively very short span of time. In respect to the realm of learning theories, expansions of technologies have provoked a broadening of learning paradigms (e.g., behaviorism, cognitivism, and constructivism) toward more self-directed, contextualized, and interactive learning environments and approaches. Rapid developments in the new ways of knowing and new ways of learning have evolved against a backdrop of society's evolution from an Industrial and Information Age to the current Interaction Age dominated by emergent technologies [1].

According to Milne (2007), society is extending from the Information Age into the Interaction Age [2]. In the Information Age, the role of digital content is broadened as something around which people engage and interact. Table 1 provides a summary of Milne's analysis regarding the shift from Information Age to Interaction Age in terms of networks, devices, interfaces, and user focus.

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Table 1 Shift from Information Age to Interaction Age

Information Age à Interaction Age		
Networks	**Transport data**	**Provide for social interaction**
Devices	**Portable devices**	**Augmented environments**
Interfaces	**Graphic interface**	**Tangible interface**
User	**Individual work**	**Group work**

Note. Summarized from Milne (2007)

In the emerging Interaction Age, people are witnessing an explosion of individually owned portable devices which are designed to augment the daily cycle of work and play. These devices enable students to plug in anywhere and share and engage with one another through shiny and colorful touch screen interfaces.

In addition, the ever-increasing power of web technologies is moving today's learners from a Graphical User Interface (GUI) to tangible interfaces that allow for a greater range of interaction modalities. Interactive smart boards, gesture-based gaming, digital pens, or even cutting edge touch screen and surface technologies allow for greater flexibility and fidelity in terms of supporting the human response. Increasingly more and more jobs require human engagement in group settings rather than individual performance. Also, the demand for critical thinking and strategic problem solving is on the rise. Virtual Learning

Environments (VLEs) have already begun to reflect this shift by embedding more collaboration, interaction and team work. The shift from an Information Age to an Interaction Age underlies the importance of understanding learning as increasingly social and contextualized [3]. In such a rapidly changing age, today's students are very different from students of the past in terms of how they have grown up with and how they use these technologies.

The Traditional Classroom vs. The Virtual Classroom or, The Sage on Stage vs. The Guide on the Side

The traditional classroom, where students are expected to passively *reproduce* knowledge, is gradually evolving into a virtual classroom, where learners will actively *produce* knowledge. In fact, Mason, J. (2005) argues that there is already a shift from *e*-learning to *e*-knowledge, stressing the growing significance of *e*-learning as knowledge management.

On this background of ever increasing web-based technologies, it is only legitimate to assume that in the twenty-first century we will witness a continuation of this trend. And this will inevitably widen the gap between traditional learning environments, centered around a "*sage on the stage*", and virtual learning environments, with their "*guide on the side*", King, A. (1993).

For language learning, the past three decades have already witnessed the shift from Computer-Aided Instruction (CAI), where students merely individually enter a computer-based environment, to Intelligent Tutoring Systems (ITS), where the learner has the significant advantage of electronic interaction. To host *e*Learning programs, various Virtual Learning Systems (VLS) have been adopted and customized to meet the needs of participating learners. Virtual classrooms are growing in adoption across all vertical markets because of ease of use and increased awareness of the benefits of deploying various open-source and commercial Learning Management Systems (LMS) for managing, teaching and training activities. Today's more flexible virtual learning environments (VLE) are creating more demand for academic, commercial and community produced learning content assets.

Computer-Assisted Language Learning (CALL)

Over the past two decades, a number of language learning/teaching environments have emerged, all taking advantage of the major potential the *Internet* has on language learning and teaching. One such environment is Computer-Assisted Language Learning (CALL) and its later extension and development into Intelligent Computer-Assisted Language Learning (ICALL), or more specifically, using the Internet for language learning and teaching purposes. These systems offer the students a high degree of autonomy, that is, the possibility of learning without the classical "learner-teacher" interactional pattern.

CALL is now widely regarded as the central acronym to refer to studies concerned with second language and computer technology. For example, individual learning through adaptive computer systems, promoted as intelligent CALL (ICALL), and web-enhanced

language learning (WELL), is used by educators who promote Internet-based activities. Overall, the main objective of CALL is to "improve the learning capacity of those who are being taught a language through computerized means" (Cameron, 1999).

The integration of CALL into the classroom has challenged instructors to become familiar with new technologies and redefine their views of teaching. Not only have computers shifted instructional practices, they have changed the way materials are designed, assessment is conducted, and how programs are evaluated. In both structural and communicative CALL, the teacher should serve as a mediator between the computer and students throughout the learning process. Although computer usage generally fosters a "programmed" approach to instruction, instructors are nonetheless reminded to stay on hand to keep things running smoothly. The computers should act as "active partners" rather than "passive assistants" to the instructional process.

Intelligent Computer-Assisted Language Learning (ICALL) is an emerging discipline that seeks to apply advanced technologies, especially Natural Language Processing (NLP), to the problems of language learning and research on learning. As a multidisciplinary area of research, it combines *Natural Language Processing* (NLP), *Intelligent Tutoring Systems* (ITS), and *Second Language Acquisition* (SLA).

What is it that makes these systems intelligent?

Their "intelligence" lies in the use of parsing. Parsing is a technique that enables the computer to encode complex grammatical knowledge such as humans use to assemble sentences, recognize errors, and make corrections. "Parsing is the process by which grammatical strings of words are assigned syntactic structure" (Patten, 1992, p. 29).

A parser-based system generally consists of three modules: an *expert* module, a *student* module, and a *teacher* module. The expert module houses the language knowledge and can process the text produced by a language learner. It identifies the grammatical functions of the parts of a sentence. This is usually achieved by a parser. (Holland et al.,1993, p. 28).

An Intelligent Language Tutoring System for ESL?

In order for a program to detect a grammatical error and to supply appropriate feedback, it needs a grammar checker to achieve its educational goal. This checker is called a parser. This grammar checker, or parser, can be programmed to detect any numbers of errors, such as

- determiner-noun disagreement: *this cats,*

- subject-verb disagreement: *they is,*

- erroneous use of modals: *I should to go with you,*

- absence of a necessary plural or determiner: *I like cat,*

- absence of determiner/plural/3rd person singular –s: *student like.*

Incidentally, it is precisely this list of common errors that our students make on a regular basis, and it is this researcher's firm belief that an intelligently designed program, created around a parser that can detect these particular errors and provide a clear feedback, is the answer to designing an Intelligent Tutoring System for ESL.

This researcher will have to identify, select and focus on one, maximum two related problem areas from this list - a potential such focus can be on determiners - with the ultimate aim of developing an Intelligent Language Tutoring System for ESL.

Virtualization of Learning

Basically, a Virtual Learning Environment (VLE) is an integration of more flexible, comprehensive and dynamic communication and online three dimensional technology used for education purposes. A Virtual Learning Environment (VLE) might also refer to a software system designed to support teaching and learning through the Internet [5]. A good example of a successful multi-user virtual environment is Second life (SL), an open source online virtual world that was introduced in June 2003 [6]. The opportunities created by second life are expanding in every field, especially education where its usage with another open source application, Moodle, a learning management system, has created what is called as "Sloodle", a powerful learning system for virtual environments [7]. Sloodle provides a range of learning and teaching tools in the immersive virtual world. For example, the Dubai-Korea Virtual Cultural Exchange Project used Sloodle as a learning management system and Second Life virtual space for all the related final activities [9]. This project was conducted in 2008 for a seven week class for learning English as a Second Language (ESL).

The majority of research and case studies prove that using a Virtual Learning Environment (VLE) increases student's motivation since the activities are comparable and close to the real world and require effective interaction during studying.

Three dimensional (3D) Virtual Learning Environments (VLEs) using Second Life have been successfully used for innovative collaboration and communication both in and outside of the classroom to help facilitate teamwork and interactions among student team members

in software engineering and computer sciences classes at Ohio University and the University of Washington [10]. Students who participated in this research indicated that their gaming experiences in Second Life improved not only the fundamentals of software specification activities but also the principles of software development. Another research in the United Kingdom using three dimensional (3D) Virtual Learning Environment (VLE) also found that using computer games enhances motivation of teachers and students [11]. This study also found that there was a significant gender divide in using computer games for education since boys were more likely to play games for leisure than girls and a majority of the students (82%) played computer games outside the class at least once a fortnight. The study also indicated that a significant majority of teachers (72%) did not play games for leisure.

Usage of Virtual Learning Environment (VLE) has been influenced by many factors especially the usability factor. Usability trust components of VLEs are attributed to ease of use and their usefulness in achieving learning goals. Students have a very positive attitude for VLEs since they indicate that they will use VLEs whenever needed and recommend by others as well [12]. The experiences gained from the construction and design of an immersive interactive museum on Second life might also apply to other similar large projects. The massive work done by Qing Zhu (2007) lists four steps needed to produce content in a VLEs. The 4Cs included: i.Create, ii.Collect, iii.Calculate and iv.Collaborate.

The first step is to create a demonstration of 3D VLEs. This step involves emphasis on the processes of using new methods for learning. The second step is to collect all relevant information from the real world to simulate in VLEs. The third step is to calculate the expense in VLEs, since only the membership is free, but the rest will be charged. The fourth step is to collaborate among experts from different disciplines to construct 3D VLEs. Collaboration may involve artists, musicians, painters, technicians and a whole host of creative people who may add value to the project [13].

Interestingly, moving from Information Age to the Age of Interactions is not a global phenomenon. There are pockets of excellence and innovation in the usage of 3-D Virtual Learning Environments (VLEs) and they mostly exist in the Western countries which created these technologies. The rest of the world is still struggling to enter the Information Age, especially the academia and higher education in particular.

Conclusions

This paper has reviewed a few emerging technologies that are shaping the new Interaction Age. Engagement, interaction and rich experiences in Virtual Learning Environments (VLEs) are critical elements of life long learning in general, and second language acquisition in particular. So far we have seen a lot of software, hardware and

applications being used for creating flat two dimensional virtual environments. However, new technologies such as parser-based Tutoring Systems, Google applications, Second Life, You-Tube and 3D Virtual Learning Environments (VLEs) are changing the nature and quality of learning. The very fact that more and more people world-wide are now connected to the Internet, the potential of these technologies for enhancing quality of life long learning (LLL) is unprecedented. Young students studying in schools, colleges and universities have much more confidence in using these new and emerging technologies in shaping their future.

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