

# Using Emergent Technologies for Facilitating Engaged Learning in a Virtual Learning Environment (VLE)

**Kuldeep Nagi and Dr. Poonsri Vate-U-Lan**  
College of Internet Distance Education  
Assumption University  
Bangkok, Thailand  
Email: knagi@au.edu & poonsrivtl@au.edu

**Abstract-** The main purposes of this paper is to explore the significance of emerging technologies for engaging and enhancing interactive eLearning. 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 Google Applications, Cloud computing, Virtual Reality, and ubiquitous learning via iTunes U using mobile devices. These technologies are among those at the leading edge of innovation and hold promise for the future of higher education. We also argue that these technologies must enhance student engagement and interaction in the increasing use of virtual learning environments (VLEs).

**Keywords-** Engaged Learning, Emergent Technologies, Google Apps, iTunes U, Interactivity & Virtual Learning Environment (VLE)

## I. 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 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, of 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), the 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. The 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. To summarize

briefly, “digital networks have evolved from carrying data in a purely

how they have grown up with and use these technologies.

**TABLE 1**  
Shift from Information Age to Interaction Age

<b>Information Age → Interaction Age</b>		
Networks	Transport data	Provide for social interaction
Devices	Portable devices	Augmented environments
Interfaces	Graphic interface	Tangible interface
User focus	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

## II. FUTURE OF LEARNING-TRENDS

Various web enabled technologies are now moving from the periphery to the center of student’s lives. One of the most influential trends is lead by Google. Google is not about search. This Internet based service is integrating commerce, communication, advertising, publishing, entertainment and education in one space. Incorporating Google into the learning ecology of higher education is happening in a big way in the universities in the USA and Europe. The rapid transformation of technologies also have risky affects on traditional Online Public Access Catalog (OPAC) libraries since network-level search engines are becoming more relevant as more users rely on Google and Google Scholar [4]. Google provides a wide variety of powerful applications that are not only enriching the learning environment but adding new dimensions to communication, engagement and interactivity. Figure-1 provides a list of Google applications that are available for integration with today’s eLearning systems.

### A. Cloud Computing

The concept of cloud computing is based on a new paradigm in which of data and applications reside in the network, not in the devices owned by a users. There is a dramatic shift in the ways how the new knowledge is being created, stored and distributed using the new media. There are three key drivers of change shaping the new era of Interaction Age. These three drivers have lead to the creation of what experts call as “cloud computing”. A brief discussion of the three major developments is given below.



Fig. 1 Cloud Computing

**i. Production of new content-**In recent years there has been a tremendous shift in the ways new knowledge is produced. Democratized tools of production have given birth to millions of personal blogs and web sites. It has also enabled global collaboration to create new content on sites such as Wikis and social networking services like Facebook, MySpace and SecondLife.

**ii. Access to new content-** The cost of connection to the world-wide-web is reducing every day. Anyone with a connection to the internet can access this vast reservoir of knowledge residing in the cloud. With increasing ubiquitous broadband capabilities the ease of access has led to a dramatic increase in the number of users in Asia. There is also an exponential growth in broadband penetration world-wide. Table 2 given below depicts the dramatic rise in the population of internet users in Asia which in 2008 amounts to about 41.3% of the global share.

**TABLE 2**  
2008 Year-end Internet Users in Asia

Region	Population	Internet Users	P. R. (%)	% Table
Asia	3,780,819,792	650,361,843	17.2 %	41.3 %

Source: Internet World Stats, estimates for December 31, 2008.

**iii. New mode of storage of content -** The cost of storage has also come down drastically. Increasing use of portable storage devices such as flash USB sticks and mobile phones is changing the ways we store and retrieve information. The falling cost of storage is shifting the mode of storage from

individually owned devices to the network or the cloud. Much of the newly created knowledge is now residing in the internet infrastructure. Google applications along with other repositories such as Hotmail, Facebook, You Tube and SecondLife allows user to create and store huge amounts of content in the cloud.



Fig. 2 New Mode of Storage

**B. Apple, Mobile Learning and iTunes U**

One of the most successful examples of cloud computing targeting higher education is iTunes U (iTune University), a product as well as a service created by Apple Computers. As we all know it well that in 21<sup>st</sup> century learning no longer happens only at a desk in classroom located on a campus. Students enrolled in universities now expect constant access to information, no matter where they are. Students are already coming to the colleges and universities with portable computers and devices such as an iPhone, iPod and other smart devices in hand. So they're used to gathering information on the web, getting their email, watching lectures, getting directions, or pinpointing exactly where their friends are- anytime and anywhere. Now they can also learn anytime and anywhere, too. Which is exactly why more and more faculty in American Universities is using iTunes U to distribute digital lessons to their students? iTunes U is possibly the world's greatest collection of free educational media available to students, teachers, and lifelong learners. With over 100,000 educational audio and video files available, iTunes U has quickly become the most powerful engine for the mobile learning (mLearning) movement. Unfortunately,

iTune U services are not available to universities in Thailand and a few other ASEAN member countries.

### C. How Apple Makes It Happen

From portable computers and mobile devices to software and servers to iTunes U, Apple makes all the technology for mobile learning a reality for the students all over the world. Instructors are using iLife and iWork applications on the Mac to create customized educational materials, such as language lessons that students can listen to on the bus or at home.



Fig. 3 iTunes University

And with the help of tools like Podcast Producer and Wiki Server- both of which come with Apple's Mac OS X Server- IT professionals in the schools, colleges and universities can produce and distribute all kinds of multimedia content on iTunes U or a class Wiki.

Once the classroom presentations and lectures have been uploaded and published, students can download them from iTunes. Then they can transfer them to iPod or iPhone and take it all with them. And suddenly, any place- a café, a bus stop or a Sky train in Bangkok can be a place to learn. To ensure compatibility, the media provided should be in: AAC, MP3, MPEG-4, or PDF format.



Fig. 4 External iTunes U Sites

Figure 4 given above exemplifies few universities in USA which has provided all their educational content for free on the external iTunes U site. Anyone can access the course materials from any part of the world.

### IV. VIRTUALIZATION OF LEARNING

Basically, Virtual Learning Environment (VLE) in 21<sup>st</sup> century is an integration of more flexible, comprehensive and dynamic communication and online three dimensional technology used for education purposes. A Virtual Learning Environment (VLE) also has been referred 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.

The majority of research and case studies prove that using Virtual Learning Environment (VLE) increases student's motivation since the activities are comparable and close to real world and require effective interaction during studying [8].

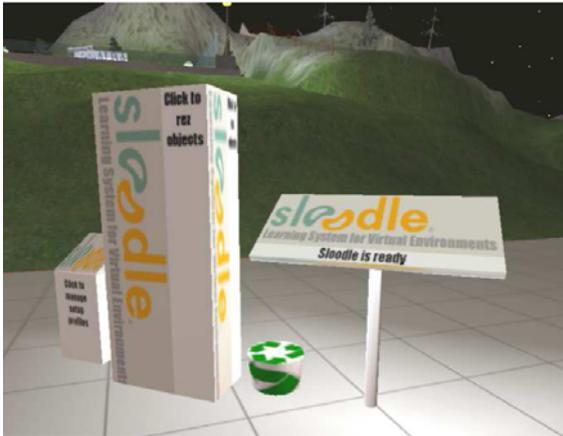


Fig. 5

Dubai-Korea Virtual Cultural Exchange Project Using Sloodle

For example, the Dubai-Korea Virtual Cultural Exchange Project shown in the Figure 5 above 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).

Three dimensional (3D) Virtual Learning Environment (VLE) 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 principles of software development. Another research in 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 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 component of VLEs are attributed to ease of use and its usefulness in achieving learning goals. Students have very positive attitude for the VLEs since they indicate that they will use VLEs whenever needed and recommend to 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 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 processes of using new method for learning. The second step is to collect all relevant information from real world to simulate in VLEs. The third step is to calculate the expense in VLEs, since only the membership is free, but island and fee for maintenance and so on 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 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 3D 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.

## V. 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 element of learning. 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 cloud computing Google applications, iTunes U, Second Life, YouTube 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 learning is unprecedented. Young university students have much more confidence in using these new and emerging technologies in shaping their future.

### REFERENCES

1. Jennifer M. Brill and Yeonjeong Park ,2008 “ Facilitating Engaged Learning in the Interaction Age Taking a Pedagogically Disciplined Approach to Innovation with Emergent Technologies” International Journal of Teaching and Learning in Higher Education, 2008, Volume 20, Number 1, 70-78
2. Andrew J. Milne, 2007 Entering the Interaction Age: Implementing a Future Vision for Campus Learning Spaces....Today, EDUCAUSE Review, vol. 42, no. 1 (January/February 2007): 12–31
3. Moore, Anne H, Fowler, Shelli B, Watson, C. Edward 2007 Active Learning and Technology: Designing Change for Faculty, Students, and Institutions, EDUCAUSE Review, v42 n5 p42-44
4. Wang, J., & Lim, A. (2008). Local Touch and Global Reach The Next Generation of Network-Level Information Discovery and Delivery Services in a Digital Landscape, Library Management (Vol. 30, pp. 25-34).
5. Wikipedia. (2009b, March 5, 2009). Virtual learning environment. Retrieved March 6, 2009, from [http://en.wikipedia.org/wiki/Virtual\\_learning\\_environment](http://en.wikipedia.org/wiki/Virtual_learning_environment)
6. Wikipedia. (2009a). Second Life. Retrieved March 4, 2009, from [http://en.wikipedia.org/wiki/Second\\_Life](http://en.wikipedia.org/wiki/Second_Life)
7. Linden Research. (2009). Using Virtual Worlds in Education Programs. Retrieved March, 2009, from <http://secondlifegrid.net/slfe/education-use-virtual-world>
8. Leng, B. A. d., Dolmans, D. H. J. M., Muijtjens, A. M. M., & Vleuten, C. P. M. v. d. (2006). Student perceptions of a virtual learning environment for a problem-based learning undergraduate medical curriculum, Medical Education (Vol. 40, pp. 568-575).
9. Surridge, C., & Shammass, N. (2009). Using Sloodle: Dubai-Korea Virtual Cultural Exchange Using Sloodle to Support learning and teaching. Retrieved March 6, 2009, from <http://www.sloodle.org/moodle/mod/resource/view.php?id=931>
10. Ye, E., Liu, C., & Polack-Wahl, J. (2007, October 10 – 13, 2007). Enhancing Software Engineering Education Using Teaching Aids in 3-D Online Virtual Worlds. Paper presented at the 37th ASEE/IEEE Frontiers in Education Conference, Milwaukee, Wisconsin, USA.
11. Leng, B. A. d., Dolmans, D. H. J. M., Muijtjens, A. M. M., & Vleuten, C. P. M. v. d. (2006). Student perceptions of a virtual learning environment for a problem-based learning undergraduate medical curriculum, Medical Education (Vol. 40, pp. 568-575).
12. Omosule, S., Shoniregun, C., & Preston, D. (2008, 13-16 Nov. 2008). A Framework for Culture Influence Virtual Learning Environments Trust. Paper presented at the Third International Conference on Digital Information Management, 2008. ICDIM 2008, London. UK.
13. Zhu. Qing, Xiang. Kai, and Hu. Shenghong, "Design an Immersive Interactive Museum in Second Life," in *Second Workshop on Digital Media and its Application in Museum & Heritage DMAMH 2007* Chongqing, China: IEEE Computer Society Washington, DC, USA, 2007