Is “e-Teaching” Web Zero or Potentially Web 2.1?

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Abstract

The current pedagogical trend about involving students in their learning is naturally extended to student-centered learning in e-Learning systems. Likewise, instructional designs are developed to enable and motivate students at center stage to learn effectively and willingly. However, from our ten years of experience in promoting an e-Learning system called TIES in higher education, we have realized that an “e-Teaching” environment for teachers to teach effectively and happily needs to be founded as a prerequisite to successful e-Learning.

We further argue that “e-Teaching” can be developed to be a central idea that is actually more important than e-Learning. The reasons are as follows: (1) teaching is more fun and active than learning, (2) teaching requires more creative and imaginative brain work than learning, (3) teaching creates more value than learning, and (4) the Web is growing as a global brain harnessing intellectual knowledge. A seemingly innocuous shift of the center of attention from students to teachers may transform e-Teaching as a current Web 0 status to even Web 2.1, if we may borrow a trendy word from a recent Web 2.0 hype.

1. e-Teaching and e-Learning Defined

Increasingly, e-Leaning today is defined by terms like Information and Communication Technology (ICT) in the context of ubiquitous IT network society[1]. However, the bottom line of e-Learning is defined as training delivered on a PC/Internet to improve students' learning performance and their self-motivation and self-directedness. Instructional designs are also aimed at supporting students to learn effectively in an e-Learning environment. Thus, the architecture of e-Learning is clearly focused on students, and we can rephrase such e-Learning as follows:

a. e-Learning is for students to learn effectively and happily.
b. e-Learning is to motivate and direct students to learn willingly.

Although there is nothing wrong with this definition, we are all aware that it is not easy to promote e-Learning in higher education. There are many reasons why this is the case. Some of them are: (1) teachers’ efforts and sacrifices for good teaching are not recognized for promotion or tenure as much as their research performance, (2) teachers feel fear and anxiety of experiencing a new pedagogical tool that requires not only IT but even ICT skills, (3) a machine trouble always irritates teachers, and (4) teachers do not want to be held responsible for copyright infringement of using other people’s content.

Note that student-centered e-Learning functionalities and instructional designs are not directly relevant to those problems that most teachers stumble upon in a new e-Learning environment[2]. That is, we need a different conceptual framework and backup systems for teachers to use IT and ICT, and we call it “e-Teaching”.

We define e-Teaching as a system designed to improve teachers' teaching performance, and their self-motivation and self-directedness. Its service designs are aimed at supporting teachers to teach effectively and happily in an e-Learning environment.

It is clear that the architecture of e-Teaching needs to be centered on teachers, and we can rephrase e-Teaching as follows:

c. e-Teaching is for teachers to teach effectively and happily.
d. e-Teaching is to motivate and direct

teachers to teach willingly.

Given the above definitions of e-Learning and e-Teaching, we argue next that e-Teaching is not just a prerequisite to e-Learning, but can be a great innovation of education in the global Web network.

2. e-Teaching and Web 2.0

The current hype in the Internet business is a new concept called Web 2.0, which tries to distinguish the second generation of Web businesses such as Google from the first such as Netscape and the like[3]. Though what is Web 2.0 is not well articulated yet, it can be considered as follows: The IT revolution is evolved first from a rapid cost reduction on hardware, then to an increasing return to scale manifesting on software, and now data/content services at the center stage in value-added terms. From this chronological development of what consists of value in IT world, the Internet is most harmonious to the current data/content service stage.

The reason is that today's Web is characterized by information/data explosion, and Web users have increasingly needed a service to search for relevant information. What Google has done here is that it has successfully installed an autonomous program that self-compounds zillions of data/content in today's Web into something more valuable than otherwise ignored/forgotten useless digital bits and pieces.

What is more important in this paper is that today's Web is characterized by linking people's brains like a global neuron/synapse network, where brain functionality such as creating new ideas and knowledge is considered to be the most valuable. Naturally, a paradigm shift has taken place in such a way that neither hardware nor even software bundled with stand-alone PCs can command high value anymore. Everything essential and valuable is created and transacted over the other side of the virtual global brain in the Web, whereas hardware and software have been treated as just cheap commodities on this side of the real world.

If these are the ideas behind Web 2.0, what can we say about e-Teaching? First, though the current stage of IT revolution gives content/data a dominant victory over hardware and software, who is creating such content/data everyday? It is Web users, and some act more like "teachers who create and dispatch knowledge" while others act more like "students who search and receive knowledge." In the meantime, it is the existence of teachers that can command the most value added in the Web network brain. Thus, the next evolution of the Web is expected to take place by replacing a current stage of data/content services with highly valuable knowledge creators and knowledge evaluators in the future Web brain. And we call them e-Teachers.

Second, it is well demonstrated from the prospering Web phenomena such as blog and i-Tunes communities that our human brains prefer information creation/teaching to just receiving/studying. This is because teaching is more fun and active than learning, and it seems more rewarding to teachers than students psychologically. More importantly, teaching requires more creative and imaginative brain work than learning, which essentially implies that teaching can create more value than learning.

These are the reasons why we argue that a little more attention be given toward e-Teaching and e-Teachers than e-Learning and students. What then is necessary to make e-Teaching become even beyond Web 2.0 is how to provide a system that proliferates an autonomous growth of e-Teachers, who are happy with and skillful in using a variety of new Web 2.0 tools to create value-added content/knowledge continuously.

3. What Makes e-Teaching Web 2.1?

The latest technological trend of Web 2.0 is the combo box of the features like ePortfolio[4], blog, videoblog, social networking, podcasting, all with multiple devices, wiki and search tools for research repositories, and so on.

These Web 2.0 developments sharply differ in architectural philosophy from previous Web 1.0 systems[5]. As a result it implies for higher education that a different set of standards and functional systems of e-Learning/e-Teaching have to be reconstructed to reflect new

instructional and educational context inferred from these new developments[6].

In particular, the rising importance of the social networking sites (SNS) indicates that people's emotional, personal and viral connections in real social life are also found to be exerting a powerful effect on the virtual Web society. It means that Web 2.0 e-Learning/ e-Teaching systems need to identify and account for personal comfort, sense of identity and even therapeutic effects on users to develop successful learning inside an online community, which in turn characterizes instructional and educational context, which finally determines new Web 2.0 architectures.

From this line of thought it is clear that a learning community and culture for young college students, for example, should be designed differently from teaching community and culture of college professors and professionals.

Following the definition of e-Teaching made in section 1, a Web 2.0 community for e-Teachers should provide features to motivate and direct them to teach happily and willingly: Examples are (1) ePortfolio feature can assist and motivate teachers to connect their personal performance and passion for teaching with colleague and academic communities through personalized resume, blog, contact information, publications, showcase, etc., (2) the RSS feed and social bookmaking select savvy e-Teachers systematically as a result of "wisdom of experts" harnessing collective intelligence of the professional community, (3) "from person to person" invitation with word of mouth trust system can self-propagate and ignite an explosive growth in teacher membership to reach a critical mass to enable, for example, content sharing across many disciplines, and (4) a new Web 2.0 business model of higher education may be founded based on this e-Teacher community.

Though the purpose of this paper is not to discuss means to monetize higher education, it is worth pointing out how powerful Web 2.0 is now in business world by asking how much this Web membership is worth.

Observe that in September 2005 eBay agreed to acquire Skype Technologies for about $2.6 billion in straight cash and eBay stock, plus some more money. Skype then had about 54 million registrations for its free VoIP phone services[7]. A simple calculation of $2.6 billion divided by 54 million users is equal to about $48 per user.

Another example is that Google has recently signed an agreement to be the exclusive advertising provider on the SNS MySpace.com that has a community of more than 50 million members. In exchange of the deal, Google agreed to pay at least the total sum of $2.7 billion to its parent company News Corp. That is, one MySpace user in Google's eyes is worth about $54.

These examples suggest that it is prerequisite for a Web 2.0 business to gather a critical mass of users by giving away useful or interesting tools free to reach out to the Long Tail.

This is the Web 2.0 concept that used to be very difficult for many people to understand. Nat Torkington[8] explains well about this point that successful Web 2.0 companies "all give up something expensive but considered critical to get something valuable for free that was once expensive. For example, Wikipedia gives up central editorial control in return for speed and breadth. Napster gave up on the idea of "the catalog" (all the songs the vendor was selling) and got breadth. Amazon gave up on the idea of having a physical storefront but got to serve the entire world. Google gave up on the big customers (initially) and got the 80% whose needs weren't being met."

The Web 2.1 e-Teaching also has to encode what would be its macro objective to achieve and what software or tool to give away free to leverage the Long Tail, and how to convert it into structural value-chains in one integrated business plan.

4. A Brief View of TIES System

Facing a pressing need to deal with students' failing levels of basic understanding of subject matters and their lack of motivation for study, we have developed an e-Learning system called TIES[9] at Tezukayama University since 1997.

It was a very first Web educational system in Japan that was implemented for everyday teaching in actual classes and that some of the

courses were made open free to the public through Internet.

Figure 1 illustrates a top page of TISE, where students select their schools to log in. The design of TIES is intentionally made to look cutesy to reflect students' cultural preference in Japan.

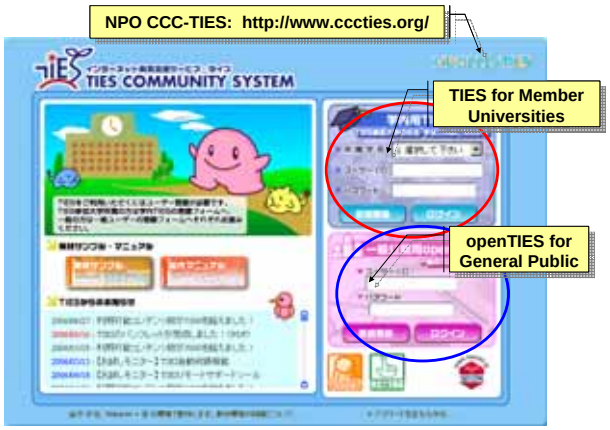

Figure 1 TIES Top Page

Figure 2 is an example of course layouts in TIES, where a teacher can organize her class according to her syllabus or anyway she likes by simply selecting/placing an icon of content, folders, a live system, communication tools such as chat, bulletin board, instant messenger, announcements, student poll and feedback, etc., with her control of viewable/sharable access levels of students or other teachers to each object.

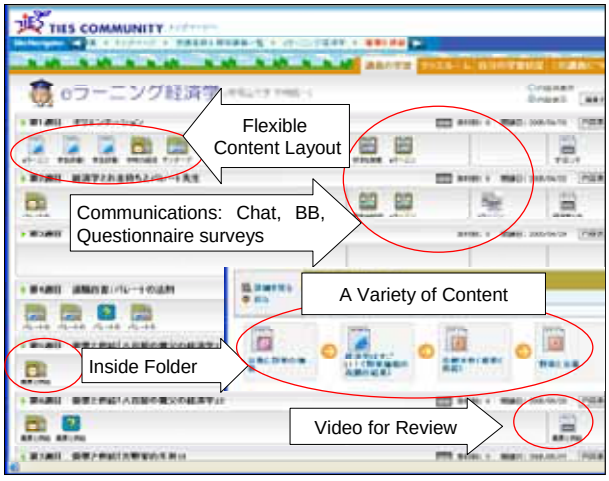

Figure 2 Course Layouts in TIES

In addition to TIES for college students, its sister system called openTIES has been developed to promote an open courseware initiative since 2004. The idea is to encourage each teacher to make her teaching videos and courses taught at TIES available to the general public freely and openly for assisting their lifelong learning.

It is also intended to help teachers to develop educational skills and experiences by observing other teachers' pedagogy and e-Learning skill and know how. So far about 100 courses and 32 course wares have been offered to the general public.

One special feature of openTIES is that it has an Amazon.com type of ranking among listed courses and course wares as shown in Figure 3.

Figure 3 OpenTIES

Supplementing TIES and openTIES systems, we have also set up an NPO called CCC-TIES [10] open to everyone to promote e-Learning and e-Teaching for a wide variety of educational purposes not necessarily confined to higher education.

5. Assessment of TIES System

Since the birth of the teacher-centric TIES systems ten years ago, we have realized that e-Teaching is essential not only for e-Learning but also for persuading and encouraging teachers to create content and knowledge with high value.

However, since it was too early for most of the teachers to understand the benefit of the system, we always had to provide them comprehensive, integrated, easy-to-use, time efficient, non-labor-intensive authoring tools to

justify their use of TIES in class. This need of attracting and convincing teachers at the birth of TIES system of its use has predetermined the nature of the basic architecture of TIES to be teacher oriented.

Figure 4 emphasizes a point that the area of e-Learning is basically composed only of the box saying “e-Learning for Students”, and the rest belongs to the e-Teaching functionalities. Thus, we view that TIES is an e-Teaching system with its part of e-Learning as an integrated sub-system.

In order to implement e-Teaching, TIES Support Center (TIES SC) has been established and played a central role of e-Teaching support task since 2001 in (1) Teacher Relationship Management (TRM), (2) Product Management, (3) Account Management, and (4) Research & Development.

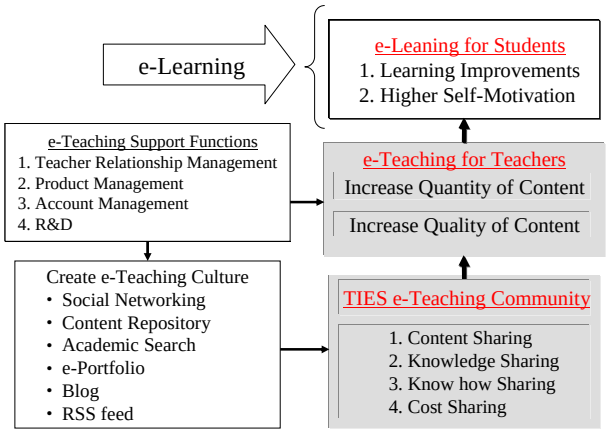

Figure 4 e-Learning and e-Teaching

TIES SC backs up teachers before, during and after class through TRM, sends out support staff for helping teachers to prepare a lecture, and monitors a live system with automatic lecture recording function to make sure that none of the lecture recording is lost due to mechanical troubles, and so on[11].

Furthermore, since TIES SC has to support teachers at campuses other than Tezukayama University, it has also developed an online remote-assistance help system that a teacher can initiate to let TIES SC take over her PC remotely and diagnose a problem or perform a task for her.

As a result of these e-Teaching support and backup systems, college teachers at 42 different universities are currently using a hosted TIES system on an ASP basis, and more than 10,000 content has been accumulated as shown in Figure 5. The number of students registered reach over 10,000, and they take more than 400 classes a year[12].

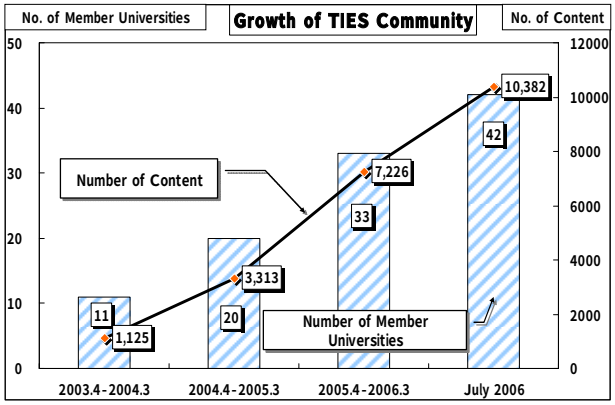

Figure 5 Growth of TIES Community

Now, how good is TIES as an e-Teaching system? A Web educational system like TIES can be assessed from a Web 2.0 perspective by following O’Reilly’s article, where he uses evaluation lists of Web 2.0 Meme Map and Christopher Alexander’s “A Pattern Language”.

Table 1 is the assessment of TIES in Web 2.0 Meme Map definition. TIES satisfies basic nature of Web 2.0, but some part of core competencies are poor, which is mainly due to the lack of TIES budget and mature technology in the past years.

1. Strategic Positioning: The Web as Platform	Yes
2. User Positioning: You control your own data	Yes
3. Core Competencies	
1. Services, not packaged software	Good
2. Architecture of Participation	Average
3. Cost-effective scalability	Poor
4. Remixable data source and data transformations	Average
5. Software Above the Level of a Single Device	Poor
6. Harnessing collective intelligence	Average

Table 1 TIES assessed in Web 2.0 Meme Map

The weak point of TIES system as Web 2.0 becomes clear in Alexander’s evaluation as shown in Table 2 that TIES lacks means to leverage the Long Tail of teacher communities. To ease these weaknesses, we are developing social networking system and application software for mobile devices as a part of our

next TIES5.

1. The Long Tail: Leverage customer-self service and algorithmic data management	Poor
2. Data in the Next Intel Inside: Seek to own a unique, hard-to-recreate source of data	Good
3. Users Add Value to your application	Good
4. Network Effects by Default for aggregating user data as automatic byproducts of their use of the application	Good
5. Some Rights Reserved for hackability and remixability	Poor
6. The Perpetual Beta, not a packaged software	Good
7. Cooperate, Don't Control, by offering simple interfaces and content syndication systems	Average
8. Software Above the Level of a Single Device	Poor

Table 2 TIES assessed in "A Pattern Language"

5. Future Plan of TIES

We believe that the real competition of the next Web evolution lies in how to develop successful autonomous e-Teaching Web 2.1 systems that integrate Web 2.0 features with more innovative concepts.

This needs new theories in online andragogy (the methods or techniques used to teach adults) of how to inspire teachers to become e-Teachers, but does not require so much of understanding of online pedagogy for teaching students[13].

For example, we need research to find out how to make teachers understand the importance of their social interactivity and social roles of "being an online teacher" in building an e-Learning community for students. And how to train teachers to help obtain such skills is another difficult issue that needs more research.

Similarly, e-Teaching systems call for a feature that can continuously identify social accountability of higher education and signal a right direction of faculty development towards what are expected capabilities for teachers to acquire in the 21st century knowledge society.

However, since the next generation of e-Teaching systems described above is still difficult to identify, for the remainder of the paper, we instead sketch an example of Web 2.0 type of e-Learning systems. This is because it is easier to identify what students need to improve their learning than what inspires teachers to improve their teaching.

In order to enrich an e-Learning environment for students, we can install a realistic student culture in the Web by social networking that emulates real college life.

For example, Facebook for college students connects students through social networks for making friends just as they usually do through classes, clubs, and parties on campus[14]. While Facebook restricts students to their school's network only to avoid uninvited strangers outside their schools, TIES students at different universities can make friends and events together as they wish. Thus, the Facebook type of enabling students to socialize with each other is the best fit to the e-Learning side of TIES to foster a vivid college culture in the Web.

After a student finds friends, he has to learn how to manage his money next. For example, he has to find out which bank account fits his needs best, and manage his budget and credit card spending for tuition, books, room and board, and he may have to find financial aids, college scholarships, or educational loans. FinAid, for example, offers such help services plus financial advice online to students[15].

Next, he may have to look for a part time job to make ends meet, or may become interested in pursuing some internships or volunteer positions. It would be so convenient for him if his e-Learning system is integrated with an accredited online job SNS, where he can quickly find a job on a part time basis, or an internship of his interests, and so on.

TIES can work in partnership with these SNS and integrate their services with its e-Learning systems to enrich a students' Web community.

We also observe that nowadays students' brains have become like TiVO[16], which edits out what they don't like to see or hear, or avoids unwanted interruption especially from their teachers and parents. Furthermore, their selection of key words to book what they like to hear and watch inside their TiVO brains often gets influenced by the word of mouth of their trusted friends. Thus, it would be nice if the next generation of e-Learning systems can take advantage of TiVO like system as a data mining device to identify a student culture more precisely and systematically.

These are a few thoughts about transforming a current Web 1.0 e-Learning concept into a Web 2.0 and beyond. As for transforming a current Web 0 status of e-Teaching into a Web 2.1, we need a lot of innovative ideas to make it happen. However, the last thing we want to do is to follow Google's way. If you do, you will always be a follower below Web 2.0.

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[1] It is also blurring the lines between LMS (Learning Management Systems) and LCMS (Learning Content Management Systems).

[2] For other problems that teachers encounter in online teaching, see Dianne C., "University Instructors' Reflections on Their First Online Teaching Experiences," *JALN* Volume 8, Issue 2, 2004, pp. 31-44.

[3] See T. O'Reilly's seminal article on Web 2.0, "What Is Web 2.0 Design Patterns and Business Models for the Next Generation of Software," http://www.oreilly.com/.

[4] See, for example, Siemens, G., "ePortfolios," http://www.elearnspace.org/Articles/eportfolios.htm

[5] Varlamis, I. and I. Apostolakis, "The Present and Future of Standards for E-Learning Technologies," *Interdisciplinary Journal of Knowledge and Learning Objects*, Vol. 2, 2006, pp. 60-76. (to be printed: Jan. 2007) See also Devedz˘ic V., "Think ahead: evaluation and standardisation issues for e-learning applications," *Int. J. Continuing Engineering Education and Lifelong Learning*, Vol. 13, Nos. 5/6, 2003, pp. 556-566.

[6] For a good survey and discussion of Web 2.0 in higher education, see Alexander, B., "Web 2.0: A New Wave of Innovation for Teaching and Learning?" *EDUCAUSE Review*, vol. 41, no.2, 2006, pp. 32-44.

[7] http://investor.ebay.com/

[8] "A Web 2.0 Investment Thesis," in O'Reilly's paper.

[9] http://www.tiesnet.jp/

[10] http://www.cccties.org

[11] See Koichi Nakajima, "TIES Initiative: Promotion of Open Courseware and Utilization of e-Learning," *Journal of Multimedia Aided Education Research*, National Institute of Multimedia Education, Vol. 2, No.1, 2005, pp. 43-54 (in Japanese).

[12] See also Koichi Nakajima, "A Shift of Focus from e-Learning to e-Teaching" presented at 6th Annual MERLOT International Conference, Ottawa Canada, August, 2006, http://conference.merlot.org/2006/.

[13] For example, according to "the Learning Management System Research Report 2005" by the eLeaning Guild, staff training and content integration with FD systems like CRM and HR (Human Resources) are troubling higher education the most. http://www.eLearningGuild.com.

[14] http://www.facebook.com/

[15] http://www.finaid.org/

[16] http://www.tivo.com/