Next-Generation eLearning:
Sharing and Re-use Digital Learning Resources
with Pedagogically-Sound eLearning Tools

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Abstract

Today, eLearning has become the key to a profound revolution in learning. This is because eLearning can offer what is possibly the most flexible and effective learning approach. With eLearning, students can study at their own pace, anytime and anywhere. eLearning enhances student's learning experience by allowing a better interactive communication with instructors. This is enabled by providing a mixture of synchronous and asynchronous learning activities administered through a well-designed eLearning environment. High-quality learning content, presented with good teaching methodologies, and instructional models can render a positive impact on the student's learning outcome.

*With its promising benefits, eLearning has now enjoyed widespread adoption not only in higher education but also in corporate training. eLearning has grown from its infancy of merely being a way to access online learning text material into a mature, dynamic, and personalized learning experience provided through powerful and blended tools (Garrison and Anderson, 2003, NIIT, 2003). But what about **the next-generation of e- Learning?***
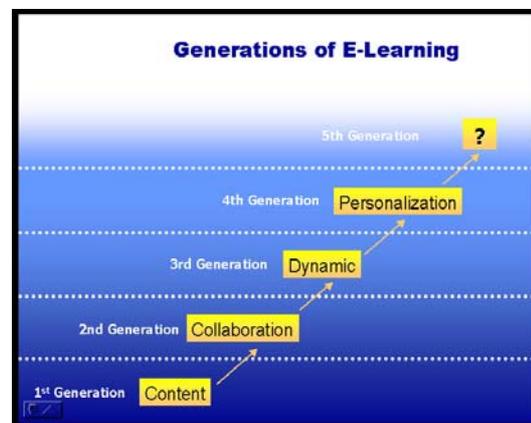
Figure 1: Generations of eLearning (NIIT, 2003)

This research report is not intended to be a forecast of the future of eLearning, nor an intensive review of all newly designed eLearning tools/ functions offered by widely used eLearning platforms. However, this study aims to create a conceptual guideline for future design and development of eLearning tools and methodologies based on some early indications. In addition, some critical issues related to the future development of eLearning are raised in order to draw the attention of those in the eLearning field. Awareness of these issues will help to prepare them for the next phase of eLearning.

Most of the ideas presented in this report are the products of the author's review on books, articles, research studies, and literature about eLearning and its future trends. In addition to the documents' review, this report presents the concepts about next-generation eLearning collected from eLearning experts, designers, and visionary thinkers in Japan. Moreover, some widely used eLearning platforms are selected by the author in order to compare their tools/ functions. Emphasis is placed on those platforms that have been grounded in modern instructional theories. Some of the newly developed innovative eLearning platforms' plug-in tools, currently still in experimentation stage, are also sought

Keywords

Next-Generation eLearning, Digital Learning Resources, Pedagogically sound eLearning Tools

Introduction

There are many ways to divide eLearning technology into its major components. A simple but widely used approach is to divide eLearning technology into 2 key functional components – learning content, and eLearning platforms[1] (techlearn, 2001). There are many fine qualities in the popular and powerful eLearning platforms. Yet, despite their popularity among users and their positive attributes, these platforms still need improvement to reach the next stage of maturity. Therefore, in the first section of this report, I present a brief review of the current status of eLearning platforms pinpointing their strengths and weaknesses. I will then report the findings of a comparison of instructional-related tools offered by selected eLearning platforms. Finally, some major areas of improvements

for the next-generation eLearning platforms are discussed.

I. A brief review on the current status of eLearning platforms

Many studies have been conducted in order to evaluate various eLearning platforms and make recommendations to their institutions or companies. eLearning platforms have become one of the top ten current information technology issues in higher education (McGee 2003). Many articles have been published discussing the successes and failures that existing eLearning platforms have experienced. The strengths and weaknesses of existing eLearning platforms are summarized as follows:

Strengths:

1. Existing eLearning platforms now come with more tools than ever before. A wide variety of tools are provided with most current eLearning platforms from simple productivity tools i.e. calendar, to advanced student involvement tools i.e. student portfolios.

2. Not only is it that the quantities of the tools have increased but the functionality of the tools have increased. For example, the discussion forums tools now not only allow users to be able to simply sort and display bulletin board messages, but also to "watch a forum" sending users email notification when new items are posted.

3. Current eLearning platforms are extensible. They are now able to integrate with other systems efficiently i.e. students' database system, SAP, KMS, etc.

4. More and more eLearning platforms are open source platforms. This means that anyone who wants to make use of them can download and adapt them free of any charge.

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[1] Also known as Learning Management System or Course Management System

Weaknesses:

1. The first and perhaps the most serious complaint about existing eLearning platforms is that they are not pedagogically driven. Most users of current eLearning platforms are experiencing the lag that the design and development of existing eLearning platforms have not kept up with research in learning theory. For example, the structurally rigid course container of the platform across the curriculum creates a one-size-fits-all experience comprised of predefined content units, consistency of instruction, and an imposed organization based on previously independent pedagogical choices (McGee 2003).

2. Current eLearning platforms hamper learning resources sharing. Only 6% of all 66 eLearning platforms reviewed in this study are able to support the sharing and re-use of learning resources. Since developing new learning resources requires a lot of time, effort, and financial expenses, eLearning platforms should provide the users with a tool to facilitate sharing and reusing learning resources.

3. While eLearning platforms are getting larger with more and more embedded tools, they are also becoming more and more complex to use.

4. As mentioned above, one good thing about existing eLearning platforms is that more and more of them are becoming open source. However, the bad thing is most of the widely used eLearning platforms are not open source. In fact, they are costly and only large educational institutes can afford to use them.

II. A comparison of widely used selected Platforms in Japan

Table 1 shows the frequencies and percentages of eLearning tools from 66 selected eLearning platforms[2], [3]. Since the focus of this report is limited to the aspect of instructional value supported by eLearning platforms' tools/ functions, only the frequencies and percentages of tools that are categorized as student involvement tools, communication tools, and curriculum design[4] were reported in Table 1. Based on the data shown, out of the selected 66 eLearning platforms, more than half of them do not have tools for student community building, video services, whiteboard, student portfolios, content sharing/ reuse, curriculum management, and instructional standards compliance. Only half of all the products reviewed have incorporated instructional design tools.

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[2] Data shown in this report is based on a review of EduTools' page on ELearning Technologies: Web Resource for Comparisons in 2003,

(http://www.edutools.info/course/compare/all.jsp) as well as an interview with eLearning designers and visionary thinkers in Japan during the beginning of 2004.

[3] The existing products in this report can/ may be improved in later versions.

[4] Evaluation format is from Bruce Landon's "Comparative Analysis of Online Educational Delivery Applications" site (http://www.edutools.info/course/compare/all.jsp)

eLearning Platform Tools	Availability	Percentages of Availability
Student involvement tools		
Groupwork	49	74.24%
Self-assessment	51	77.27%
Student Community Building	**27***	**40.90%**
Student Portfolios	40	60.60%
Communication tools		
Discussion Forums	61	92.42%
File Exchange	53	80.30%
Internal email	56	84.85%
Online Journal/ Notes	40	60.60%
Real-time Chat	49	74.24%
Video Services	**12***	**18.18%**
Whiteboard	**24***	**36.36%**
Curriculum design tools		
Accessibility Compliance	40	60.60%
Content Sharing/ Reuse	**4***	**6.06%**
Course Templates	43	65.15%
Curriculum Management	**17***	**25.76%**
Customized Look and Feel	47	71.21%
Instructional Design Tools	**33***	**50.00%**
Instructional Standards Compliance	37*	56.06%

Table 1: Frequencies and percentages of availability of eLearning tools
* N = 66

eLearning Platform Tools	WebCT 4.1 Campus Edition	Blackboard 6
Student involvement tools		
Groupwork	✔	✔
Self-assessment	✔	✔
Student Community Buildinng	✗	✔
Student Portfolios	✔	✔
Communication tools		
Discussion Forums	✔	✔
File Exchange	✔	✔
Internal email	✔	✔
Online Journal/ Notes	✔	✔
Real-time Chat	✔	✔
Video Services	✗	✔
Whiteboard	✔	✔

eLearning Platform Tools	WebCT 4.1 Campus Edition	Blackboard 6
Curriculum design tools		
Accessibility Compliance	✔	✔
Content Sharing/ Reuse	✗	✗
Course Templates	✔	✔
Curriculum Management	✔	✗
Customized Look and Feel	✔	✔
Instructional Design Tools	✔	✔
Instructional Standards Compliance	✔	✔

Table 2: Comparisons of eLearning tools provided by two widely used eLearning platforms in Japan

Table 2 shows the comparison of eLearning tools offered by two selected leading eLearning platforms widely used in Japan. From Table 2, it can be summarized that both platforms are well equipped with tools and functions that allow users to create various forms of instructional experiences.

However, it is interesting to find that none of the eLearning platforms selected provides users with a tool to share and reuse content. It is not beyond the author's expectation that later versions of all the products will be substantially improved in terms of content sharing and reuse tools[5], [6].

III. Need for Improvements

Next-Generation Pedagogically-Sound eLearning Tools

As mentioned earlier, many users especially those who are educators are still not satisfied with the way current eLearning platforms' tools/ functions support "meaningful learning." Hence, it is this

author's belief that next-generation eLearning platform developers will take this problem seriously and try to come up with a better tool that embraces sound pedagogical principles from multiple theoretical paradigms. In other words, next-generation eLearning platform content developers should be able to select sound pedagogical eLearning tools/ functions which apply best to the instructional design task at hand.

The next-generation pedagogically sound eLearning tools can be divided into 3 categories which are 1) communication Tools, 2) student involvement tools, and 3) instructional design tools.

1) Communication Tools
- Integrated video services must become a standard offered by all of the next-generation eLearning platforms. Based on the data shown in this report, only 18 % of the selected eLearning platforms in this report offer video services. However, of the 82% that do not offer video services, most of them provide add-ons through the integration of modules or links to third-party applications instead. As we already know from prior research evidence, streaming video can be a very effective option for transmitting learning materials to the students. Students can better acquire

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[5] Based on Blackboard's product overview white paper, the latest version of Blackboard (Blackboard Content System™) has now offered users a support tool to share and reuse learning resources that users have created.

[6] WebCT Vista has now incorporated content sharing and re-use tools.

knowledge through watching videos than simply reading texts.

- The next-generation eLearning tool must offer students more varied ways of communicating their ideas and thoughts. For example, the students should be given a chance to write an evaluation as they go through the learning materials, adding a note, comment or annotation if they feel like it, capturing and collecting their own personal library as they go along. Next-Generation eLearning tools must allow users to annotate and comment learning material as well as provide tailored content feeds providing exactly what the students want. (see Figure 2)
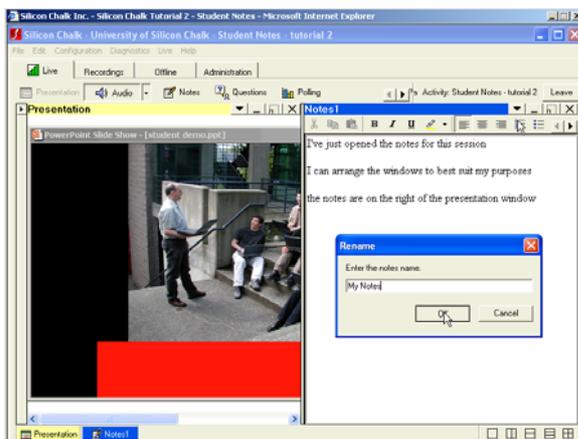

Figure 2: An example of next-generation eLearning tool (www.siliconchalk.com)

- The next-generation eLearning tool must support mobile learning. This means that students are able to use their mobile devices as a part of their eLearning. At this moment, existing eLearning platforms have already started to incorporate plug-in tools that work with mobile devices. For example, a Japanese widely-used eLearning platform called Excampus now has incorporated plug-in tool called I-Tree that allows students to visualize the current status of interactivity on the discussion forums as a wall screen on their mobile phone. In addition, many platforms now have an option of sending text messages to mobile devices indicating new postings. Much research is currently being conducted to investigate the possibilities of integrating eLearning functions/ tools into mobile devices.

2) Student Involvement Tools

Currently, most of the eLearning platforms already offer a variety of student community building tools within their products (Table 1). However, the next-generation eLearning platforms must be able to draw upon a tool that can support collaborative learning among peers with **a more structured scaffold approach**. This can be done in several ways. For example, this new tool must give clear and direct instructions on how to collaborate with peers effectively (i.e. how to write your reflective journal; or how to critique and comment on a classmates' work; etc.) when needed (see Figure 3). Or, a template-driven or wizard-type tool should be developed, one that can help students to focus on their assigned task as well as sharpen their reflections prior to sharing their ideas. With these next-generation tools, we should strive to have a richer collaborative learning environment.
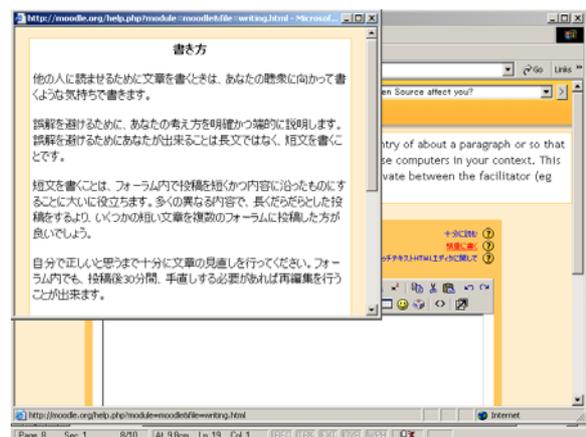

Figure 3: An example of next-generation eLearning tools (www.moodle.org)

3) Instructional Design Tools

Presently, existing instructional design tools are simply tools that help instructors to create learning sequences in small steps, for example with lesson templates or wizards. However, next-generation eLearning tools must offer better help for instructors to design meaningful learning environments for their students starting with the first step of writing meaningful objectives to the final step of assessment. In addition, the next-generation of eLearning tools should provide instructors with more advanced ways to create simulations of real-world situations in a virtual environment. A simulation-making tool is not just some scripted instructional material / presentation making tool. On the contrary, to strengthen the learner's conceptual learning, the tool must help create a representation of the material in a manner that places the learner within a context in which the material would actually be used.

Next-Generation Content Sharing and Reuse Tools

The next-generation eLearning tool must allow users (both instructors and students) to share and reuse learning resources across course containers, and support the reuse and interoperability of learning resources. In addition, the next-generation eLearning tool must allow instructors to register their learning resources with an option to designate their resources to be private or publicly accessible. In addition, to facilitate storing and accessing of learning resources by instructors, it is indeed indispensable for next-generation eLearning platforms to integrate a central content repository supporting standards such as SCORM/IMS, Dublin Core, or CANCORE.

Next-Generation eLearning with Better Interface Design and Simplified Navigation

The more add-ons eLearning platforms contain, the more complex they become. Some eLearning platform users are now facing difficulties locating where things are, or how to navigate to where they want to go within the platform. In the next-generation of eLearning, a more simplified navigation, in which related tools are grouped or linked, is needed. In addition, a more user-friendly interface design should be created and adopted in the next-generation eLearning platforms. For example, the next-generation eLearning platform can make use of graphic-based screen designs (see Figures 4-5).
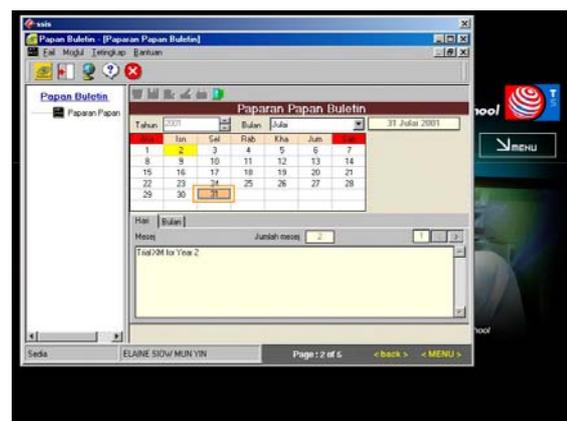
Figures 4-5: An example of next-generation eLearning Interface Design and Simplified Navigation (Smart School Management System, Project by TELEKOM, Malaysia)

Next-Generation eLearning tool that learns

Many visionary thinkers seem to feel that the next-generation eLearning platforms should be able to draw upon a tool that can learn about their users' by gathering information through their interactions and utilizations (Hodgins, 2002, Kajita, 2004). At present, eLearning platform developers are trying to develop the next-generation eLearning tool which is self adapting. Such an eLearning tool would be able to understand the context of interactions (events or actions) between users and the system. For example, by acquiring the user's log-in data such as where the user logs in from, the speed of the users connection, and the device or system the user is using to connect to the platform, the tool would be able to customize services to suit the user's conditions. This information could be used to filter unnecessary images to a low speed connection or turn on or off additional features based on the user's browser. In addition, such a tool should be able to capture observed patterns, recognizing behaviors of the user. For example, this next-generation tool must be able to learn about the user's learning competency (through the user's input) and be able to adapt its services accordingly. A good example of an attempt to build this kind of tool is the development of intelligent agents and tutors. (see Figure 6)

Figure 6: An example of next-generation intelligent tutor (http://alicebot.org/dave.html)

Summary

To summarize, what I have presented in this paper is this author's notion of the **"next-generation eLearning"** based on a study of the existing evidence and early indications.

The paper discussed the trends of the emerging tools in next-generation eLearning with an emphasis on instructional-related tools. Nevertheless, a word of caution is needed to point out that in order for next-generation eLearning tools to work successfully in creating a meaningful learning environment, well-designed strategies of teaching/ learning following instructional design principles are needed by instructors. However, since the emphasis of this report is on eLearning platforms' tools and functions, the author does not discuss the important aspects of instructional design issues in this report. In conclusion, the concepts of next-generation eLearning tools presented in this report will perhaps take several more years to mature. However, how soon it is realized depends not only on eLearning developers but also on those who will make the final decisions on the future of eLearning, "those who use it."

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