

Gold Peach Web Community 1996-2001: A Series Research on Developing Web-Based Interactive Learning Environment

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Abstract

This series research was based on three growing and progressive concepts of web community, culture and cultivation to develop an interactive learning environment for children. The series was conducted from 1996 to 2001. Five generations of web-human interaction and user interfaces have been developed and tested.

There were four sub-systems in this community: total Web-Based CAI, interactive learning navigation, collaborative learning classroom, and community management. A quasi-experiment was conducted to observe users behaviors. We found the 'web community model' was a better design for web-based learning. The culture could be an essential factor to reconsider the idea of 'software internationalization'. The cultivation was an old tradition deserved a new look.

Keywords: Web-Based Learning, Interactive Learning Environments, Web Community, Culture and Cultivation

1. Introduction

This series research attempted to access the specific objectives as follows:

Developing an interactive learning platform 'Gold Peach' for children based on the fundamental ideas of 'web community'.

Initiating the features of 'culture' and 'cultivation' on designing web environment.

Conducting a well-designed quasi-experiment including 3 primary schools to testify the usability and to observe the learning behaviors in 'Gold Peach'. Two pretests and an interval test have been done. The experiment is still under going.

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2. Literature Review and Problems Defining

2.1. Web Community

Web community was a progressive and extended concept from 'network-based learning community' that was introduced by Lave et al. (1991)'s 'situated learning' and modified by Qiou (1996). In the recent years, researchers both from the fields of education and information systems contributed deliberate ideas to build a web-based learning community with various points of view.

Reviewing the suggestions of relevant literatures, the components of network-based learning community could be summarized as the following:

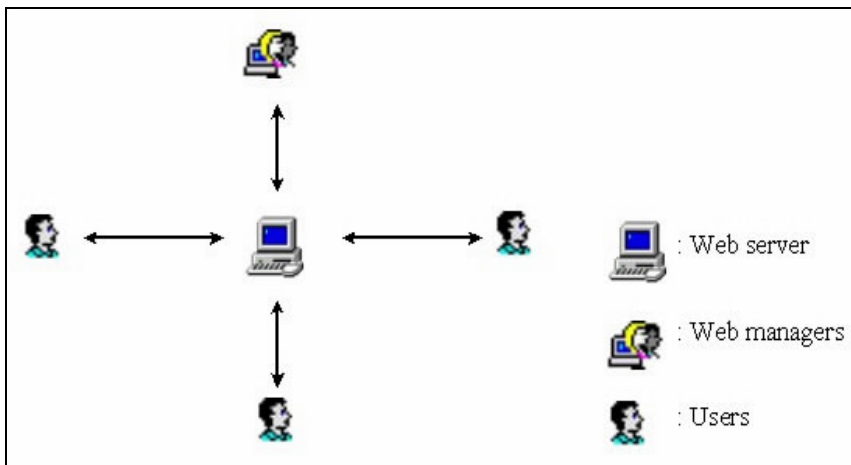
The organization of community: There were hardware, tools, and members. The community could be in an open or a closed form. Boisvert (2000) emphasized the new technology could bring more customized environments.

The learning activity: Lave et al. (1991) indicated it should have legitimate peripheral participation (LPP). Such participations included access, communication, learn to talk, collaborative learning and knowledge sharing. Michalski (2000) suggested to initiate an interaction by more deeply exploring learner needs, concerns, and expectations.

The learning material: There were both existing material that was prepared in the learning database and ongoing knowledge that was shaped by the collaborative learning processes. Mioduser et al. (2000) pointed out those developers' pedagogical conceptions and beliefs, which should be either explicitly stated or implicitly embedded in the web's design.

The moderation: Lave et al. (1991) did not reveal any leader in the community while Qiu (1996) advocated the necessary role of 'moderator' who would be the teacher to the other users (students). O'Leary (2000) also paid attention to the teachers' roles. However, Kearsley (1997)'s idea could be noted here. He emphasized an

Figure 1. Website Model



online teacher is to coordinate the learning direction more than to dominant dogmatism. After examining the literature above, the author suggested there should be the fifth element: 'the integrated interaction model'.

In general, the conceptual modes of websites interaction could be described as 'radiation model' (see Figure 1):

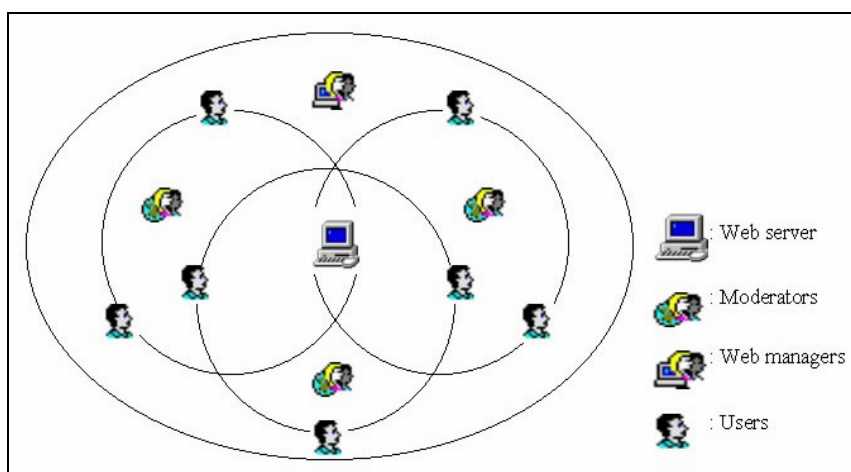
The website manager has a 'one to multiple' interaction with users through internet. The website manager will provide all web function, service content and all learning activities. In practice, it is impossible to prepare complete and sophisticated learning material,

achievement test, and all peripheral participation by a single manager or few individuals. It reflects the facts that a lot of existing learning websites that are lacking of updating or content depth.

Therefore, the author brought a new 'web community model' as Figure 2.

This model designed two different interactions:

Figure 2. Web Community Model



systems functions and information contents. The website manager would only take the former responsibility. The information contents would be divided into more sub

communities or interest groups that would be coordinated by external moderators. It was expected that there would be some interlaced area between groups, thus it would be linked as an integrated community. Group moderators did not have to worry about the web techniques; they could be concentrated to develop the learning behavioral interaction for users.

2.2. Culture

Internet makes the earth smaller, brings the world into a village. Some advocated the software behind the browsers could be 'without frontiers'. (Hall, 1997) They believed that it could adapt the user interface to different social and cultural requirements that was referred to as 'software internationalization'. (Hall et al. 1999)

However, when we are celebrating the international boundary is falling down; do we regret that the pluralistic colors are also vanishing? Though there are millions web sites, we have found the inevitable trend that the web characters grow similar faces, wear same uniforms, their interactions are more and more following consistent pattern. We cannot tell which web site is from a certain corner of which continent.

It worried him when the author called for a seminar of designing a new web with his college students. When we needed an innocent leading actress, there was only Snow White left in students' mind; when we made up a worrier model, the Black Knight came out; when we set up exploring plots, they were thinking of Star Trek. They ignored or forgot there are plenty of symbols and scientific fictional stories in Chinese history and mysteries. The young generation is losing its heritage of cultural imagination. (Wu, 1997) Thus researchers began to criticize the US-centric viewpoint and the US 'software evangelists' who determine the system design. (Kersten et al., 2001) A reconsideration suggested that we should remind web designers to consider 'cultural feature' to be an essential factor for designing web. It would be not interesting, if there were no cultural differences in the cyber world. (Henderson, 1996; Wu, 1998; Wu et al. 2000,1999)

Kersten et al. (1999) even advocated that the culture factor should be deeper-than-interface localization. It should reflect the beliefs, ideas, language, rules, knowledge, procedures and norms. The approach was clear. However, the questions of implement remained. We need more studies working on this subject.

2.3. Cultivation

Media's form (or environment) is as well as content may produce cultivation effect to children, according to Gerbner et al. (1979)'s series work concerning Media Sociology perspective. This idea may trace back from a long tradition of 'The Medium is the Message' (McLuhan, 1966). It argued that media itself would affect audience's recognition, attitudes, and even behavior.

There were rich studies and documents on 'TV cultivation theories' in 1970s and 1980s. (Anderson, 1980; Hughes, 1980) Scholars advocated that there are heavy effects influencing children by television. They also found television would build up a 'media reality' which is far different from the 'real reality'. 'TV children syndrome' was discovered and considered a serious problem.

However, there was still a positive angle to this effect. We could conclude that although media might distort one's behavioral development, while it also might inspire one's mental potential especially in his/her childhood.

WWW is the most powerful media next to television. When we reviewed the lessons from television, the author wanted to suggest that developing web is not only defining a mechanism but also initiating an organism that might cause cultivation between community members.

The effect of cultivation could be operationalized and explored by users' behavioral changes after their experiencing the new media's form and environment. Therefore, the web community also needs a two-way feedback system to collect, measure, and interpret data that real users' innovation behavior, if there is any. This old tradition deserves a new evaluation.

2.4. Current Learning Webs

The author thoroughly investigated ten significant current learning webs in Taiwan to understand if they also noticed the above three concepts. The observation could be summarized as:

Table 1.

	Web Community	Culture	Cultivation
Yes	2	0	1
No	8	10	9

Most of learning webs were in radiation model, one way teaching, and without any culture consideration. This fact explained the emerging need and encouraged the author to develop an integrated web learning community environment.

Furthermore, there was only one research paper concerning the academic evaluation on web community learning according to Eric (the U.S. Department of Education Educational Resource Information Center database) 2001. Since that paper (Waterkins, 1997) focused on the higher education system, it covered student retention rates, increased efficiency, but issues of culture and cultivation. It reflected the emerging need of a research on such issues through thorough methodology.

3. Methodology

As an application research, four methods were employed:

1. Literature reviews.
2. In-depth interviewing with experts whose major is in children education.
3. Web systems analysis and design. Four requirements had been defined, they were:
 - Total Web-Based CAI: including structural learning materials, systematic learning achievement tests, scores database, users demographic database, parameters base, and analysis tools.
 - Interactive learning navigation: guiding users how to solve problems with internet resources instead of telling them the answers.
 - Collaborative classroom: creating an online virtue space for the moderator and users to allocate assignments, talk over problems, display output, and share knowledge.
 - Community management: verifying the applications for moderators, recognizing the rights of them, providing tools and interfaces for moderators to prepare learning materials, tests, and other collaborative activities.
4. Quasi-experiment:
 - Two primary schools within the same location and similar size were designed to be the quasi-experimental groups. One control group was chosen with the same profile as the quasi-experimental groups.
 - All groups took the same learning materials and same tests before and after training. The two quasi-experimental groups took the Gold Peach as an enhanced learning tool, while the control group followed the traditional classroom learning.
 - Natural sciences materials were defined as the core task of the learning goal. All groups' learning achievement and motivation would be measured at the end of experiment program.

4. Results

4.1. Community Environment and User Interface

The web was named 'Gold Peach Web Community'. Gold Peach is a magic fruit in West Holy Mother's garden based on Chinese ancient legend. You could navigate the cloud and explore unknown world after eating the Peach. The sprit of scientific fiction is as seen as modern imagination.

Since Gold Peach also appears in the famous Chinese classic fiction ‘The story of the venture tour to West’, we adopted and inherited the background, characters and plots from the story to create the cyber environment of the web as Figure 3.

Figure 3. Gold Peach Entrance



After logging in the community, the child users could play roles as Magic Monkey, Pig, Sandman, Dragon Horse or other genius etc. They could follow Master Monk to break in 81 forbidden area that were controlled by different monsters and demons. They could steal Gold Peach to surf the WWW to find out the answers for their questions. Or, they might join one of parties in Flower Island where they could chat or work out a task

together.

4.2. Interactive Learning Design Process

The moderator (teacher or expert) users could apply to be god or goddess in South Heaven Palace. After verification procedure, they would be authorized to be in charge a specific interest group to develop the learning interaction with child users.

With an easy, step-wise, and flexible tool, they could plan their syllabus and learning units. It was easy to reorganize and modify chapters and sections.

There were multiple functions to support moderators to arrange test. They could use either closed-ended or open-ended questions, single option or multiple choices. They also wanted to design some hints for the users who did not pass the test. They could set links to the internet resources where buried the treasure of answers.

They could also direct a virtue seminar or assign a fieldwork. All participants could exchange their idea or experiences upon moderators' requests.

All closed-ended questions in tests would be graded automatically while moderators would mark the open-ended questions.

The users scores and evaluations would be computed and organized in database. A parameter framework would be derived from a certain amount of accumulative data later on. In the same time, a report of user's learning achievement would be prepared for use's parents through web connection. Parents also could reply their comments to the moderators.

5. Discussions, Reflection and Conclusions

5.1. Web Community: A progressive idea for learning environment

Web Community could be considered as a progressive idea for learning environment. It improved traditional one-way teaching and display and realized total peripheral participation and interaction.

The more advantages of 'Web Community model' than 'website model' in learning could be summarized as the following:

1.1.1.Designated activities

First of all, we suggested that the learning activity is more important than the learning materials. Examining the current learning website, we found most of them were storages of electronic textbooks. Some of them provided online tests and some of them maintained a bulletin board without a devoted moderator. It was obvious that the centralized design could not afford a function to react every user. It was almost impossible to initiate and guide an interactive learning activity for each individual user.

The Web Community design could develop interactive learning platform and environment where all community members could learn, solve problems, and share knowledge. For example, one school of our experimental groups is located beside a stream. When the students received the learning unit of 'ecological field study', the teacher had designated an observation and collection tour along the stream with a thorough web-based map and tips. The discovered clues in this activity have been proven to be more fruitful than the students can learn from a standard material.

Furthermore, the teachers could prepare various tests by consolidating learning contents that were combined primary schools' curricula with internet resources and information.

2.1.1.Remote workgroups

The author also suggested the importance of the exchange, communication, and integration between sub-communities. Though the two schools of our experimental groups are in the same district, they had few opportunity to share their teaching and learning before this project. During this experimental period, they could share, refer, or modify each other's learning abstracts, tests, and assignments. We are planning a final presentation that will be accomplished by remote workgroups in these two separated schools. They are going to finish a collaborative work in remote condition.

It was expected this collaboration model could produce more understanding in value and confidence, if these remote workgroups were in different social economic status.

Reviewing the literature of the experiences of web-based learning, we found, especially in higher education systems, the purpose of many systems were to let the students study at home and reduced the hours in classrooms. The author did not recommend that a web-based learning system is a replacement, even an alternative, for classroom learning. It should be a support and enhancement for learning in personal. The author's model suggested creating a pluralistic virtue classroom without space boundary and with holistic learning ideas while all sub-communities kept their uniqueness.

3.1.1.Existing problems

However, the researchers also found some problems that were coincidentally matched Lee (2000)'s findings in Korea. Suggestions for future improvement are as follows:

- Failing students should be identified and should receive more instructional attention.
- Feedback systems should be considered that would satisfy students' high expectation and avoid over instructions' workload.
- There is a strong need for instructional efforts to maintain the proper levels of learning and instructional demand.
- Deliberate strategies may be needed to stimulate students' serious perception of online instruction,
- It is desirable to design more fun and interesting procedures in the learning environment. Though the 'Gold Peach' used the legend characters and fictional plots, the process seemed not very attractive yet. It could be a good idea that combining game and test in the future.

5.2. Culture: A deficiency, excess and integration trace

Though the perspectives of examining the culture factor in a system design varied, the succinct and distinguished direction was from the presentation, i.e. the user interface. (Kersten et al. 1999)

Three generations of the user interface were developed during last a few years. It revealed the introspection on seeking the cultural feature of web design.

Figure 4. 1st Generation



Figure 4)

The effort on discovering lost tradition inspired the using of Chinese ink and calligraphy art to stylize the home page for the 2nd generation. The cultural specification was distinguished, however, the black-and-white idea was too abstract to attract children's attention. (See Figure 5)

Figure 5. 2nd Generation



Figure 3)

5.3. Cultivation: A ferment attempt

The result of this research 'Gold Peach Community' was expected to guide a new direction and a new method for children to develop their abilities of learning and problem solving under silent and positive cultivation.

The effort to discover the cultivation effect was still under ferment period. However, this research investigated and accomplished some feedback mechanisms in the systems. They could detect and reveal possible cultivation effects by comparing users learning behaviors and achievement.

The author is developing new functions into 'Gold Peach' to observe students' cultivating learning behaviors. These on going functions are including:

- A data mining function: it will watch the interaction between students and teachers.

There is a database to monitor and record their behaviors in 'Gold Peach'.

- A parameter base: it can analyze students' learning categories.

Though the 'culture requirement' was highlighted according to the web developing strategy for the 1st generation, the implement was relatively unsuccessful. The artists in the project team were still lost in the long term Westernized training. The leading role, Magic Monkey, was cute, but lack of originality. The presentation of icons and background were inevitably under European shadow. (See

We did not find a balance between cultural skill and modern technique until the 3rd generation. We inherit the 3-D model of Chinese flour idol and the styling interest of folk drama to create cyber characters. The objects in the background were Chinese materials with modern simplified geometric outlines. The real culture should be a living idea that contented historic and current context. (See

-An intellectual teaching-learning model base: it will select proper teaching model for teachers that will match the students' individual learning category.
Since cultivation is more likely a time series effect than a sudden change, the author also suggests a large scaled and longitudinal experiment on this issue in the future studies.

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