# The Research of Constructing The Environment Of Web-based Cooperative Learning Community

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**Abstract**— *Web-based Instruction is an unavoidable trend in recent days. Educational organizations and enterprises take part in this unlimited cyberspace by setting up a virtual teaching environment.*

*The teaching model aims at the integration of learning resources and learning procedures because of the flourish of computer technology, cyberspace communication, and transformation of education technology. Cooperative web-based learning community is an important cyberspace teaching mode in order for effectively attaining resources, making use of diverted professional knowledge, and improving teaching effectiveness.*

*The purpose of this study is to bring up an accessible model for future web-based learning community design and implementation by exploring the essence of both web-based cooperative learning community and web-based teaching environment.*

The prevalence of personal computers and network technology makes a structural change in teaching modes. Different to the traditional teacher-centered instruction, the Internet has changed the way students learn. The classroom is not limited in the boundary of a "room", so as the students no longer passively receive what they are taught.

## I. The content of web-based cooperative learning

Romiszowski and Mason (1996) pointed out that CMC (computer mediated communication) in the application of education has formed two teaching modals: one is still the traditional concept that centers around teachers or teaching materials; the other is communicative and is a new educational environment that supports cooperative learning. Hsrasim (1989) thinks that on-line teaching, suitable for cooperative learning, is a brand new education domain. (see Figure 1)
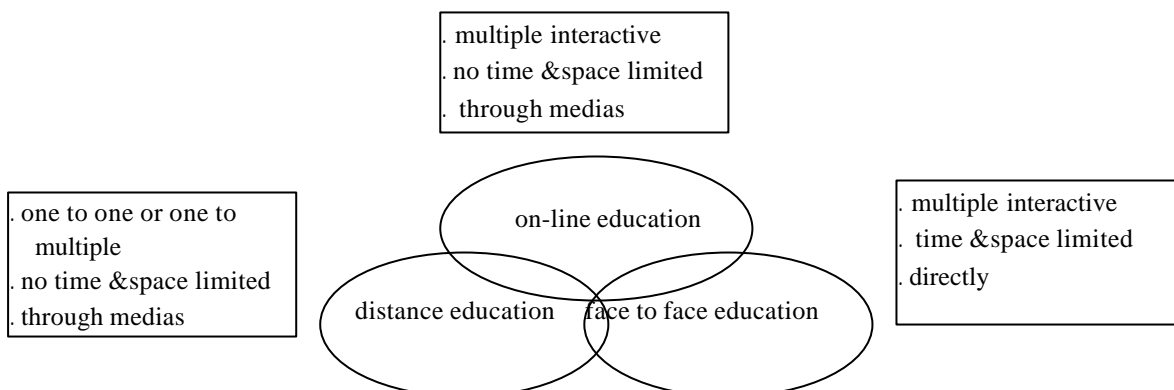


Figure 1 three chacters of the education style

Advantages of web-based cooperative learning:

1. Strong database
   In usual discussion, partial information is easy to lost. But the strong memory function of computers can be used to record the content of interaction. Learners are able to review previous discussions.

2. Broad transmitting area
   By means of boundless Internet, communication boundary can be broadened so that knowledge discussion group can include more academic communities. Thus, multiple perspectives can be shown and enrich

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knowledge domain and interaction and improve the its quality.

3. Visualized learning environment
   Electronic media can create visual images. This is difficult for the usual teaching environment. Through the help of visualized information, we can improve the depth of discussion. (Cheng, 1996)

An effective cooperative learning activity or system development should satisfy the following five elements. (Wei, 1999; Chen, 1999)

1. Cooperative group structure
   includes size and number of groups, diversity of group members, the condense and composition of group
   1) the size of groups depends on learning activities
   2) the number of groups: basically small groups with the number of 7 to 15
   3) choose members from different places in order to satisfy the request of diversity
   4) arouse feelings among group members before formal learning activities to condense the groups

2. Cooperative task structure
   Cooperative task means that groups are allowed, requested or encouraged to accomplish a task. Tasks are designed either to be a division of labor or a coordination that requires all members to work together.

3. Cooperative motivation structure
   To create cooperative motivation, an award can be given based on individual member's performance or on the outcome of a coordinated project/ product. Intrinsic motivation should replace as much as possible the external rewards, for example, let group outcome has the opportunity of public exhibit, or let participants find pleasure from learning activities.

4. Individual responsibility
   To look into individual responsibility is to avoid someone picking work. This is how "individual responsibility" should be designed: give awards to groups according to each member's learning or accomplishing tasks. The other way is to give unique tasks to group members.

5. Cooperative environment structure
   Cooperative environment includes space that group members can get together to hold meetings, discussion and to learn. It is also a place for groups to exchange data and knowledge. Interactive channels or tools should be provided as much as possible, but should not be too much to create interference.

II. The meaning of web-based learning community

Web-based learning community is a virtual learning community, in which all experts and can find solutions to problems together though discussion and interaction, and then build their own knowledge system. Internet is only a tool of its application; by means of the tool, we can combine all personal knowledge experiences. Web-based learning community, in short, is a concept of knowledge sharing. In the society, everyone has his or her professionalism. By means of web technology, every person can share with others his or her experiences. In the web-based learning community, everyone can be a knowledge giver or receiver, and through interaction with different experts, knowledge is gradually constructed, and then a learning community. (Chiu 1996; Collins & Bielaczyc, 1997) The following table is a collection of definitions of web-based learning community. (see Table 1)

Web-based learning community is defined as: in the society, everyone has his or her specialty and deficiency. Through the use of web technology and virtual reality and the cooperation of ??and experts, the resources and experiences can be shared, aimed at learning motifs. Learners should learn independently, construct knowledge actively. Members should bear the concepts of sharing and providing, and manage a free and open virtual learning community, a web learning system that accelerates all members to grow. (Chen, 2001)

III Related learning theories of web cooperative learning community

1. Social construction
   In social construction, learning is based on old knowledge. Through the interaction with others on the Internet, we construct knowledge layer by layer. When new and old knowledge conflicts, learners will test repeatedly and then adjust to construct personal knowledge. Through this process, a common group

consciousness is gradually formed. The web-based learning community happens to provide a environment for the development of individual knowledge and group interaction.

2. Situated cognitive

Web-based learning community arranges a lot of learning contexts for participants to explore

while learning. All sources of knowledge come from the abundance of Internet resources and the sharing of real lives of participants. (Chang, 1998) Thus, in the process of implementing web-based learning community, we should make sufficient use of virtual reality for learners to learn actively.

Table 1 table of the Definition of web-based learning community

| Scholars | year | Definition toward web-based learning community |
|---|---|---|
| Salomon | 1993 | the core concept is distributed knowledge: everyone in the world has his/her specialties, if everyone uses his/her specialty to assist children learn skills, children's learning will be more dynamic. People in different areas can provide different knowledge to children, which can broaden their knowledge. |
| Chiu | 1996 | Combine all the new hands and experts together, without the limit of time and space, to join the learning activities. They have the rights and obligations of sharing and providing knowledge to make all the group grow together. |
| Hsu & Yang | 1997 | A virtual learning community, in which new hands and experts can figure out solutions together by discussion or other interactions and construct their knowledge system. This is a tool for connecting distributed personal knowledge and experience. |
| Chang & Tang | 2000 | 1. Every learner learns independently, construct knowledge independently.<br>2. All members should have the concept of "sharing and providing".<br>3. Emphasize on the importance of distributed professionalism. |

Through the cooperation among learners, best learning effect can be achieved. And then when entering the same situation, the original cognition will transfer to reach the goal of knowledge acquisition.

3. Cognitive apprenticeship

In web-based learning community, it is emphasized that knowledge is constructed by the interaction of experts and new hands. Learners are lead by experts, mimic how experts do trouble-shooting and ask when encountering questions. Learners can make use of e-mail, discussion room, news groups, e-board, net meetings, etc to observe the knowledge skills.

4. Cognitive mentoring

The interaction between experts and new hands can be described as the following six steps:
1) learners find out problems and ask for solutions
2) learners and experts define problems and diagnose them
3) experts and learners work on solutions together
4) learners do trouble-shooting with the assistance of experts
5) experts conduct analysis and discussion of solutions
6) learners revise the solutions and then implement them. (Yang, 1997)

IV. Constructing web-based cooperative learning community environment

In terms of constructing a web-based cooperative learning community environment, Barret (1999) brings out the following perspectives:

1. Participating in publishing: eg. participating in publishing articles in all the discussion boards.
2. Socializing: eg. greetings on the Internet
3. Interaction: making responses to articles on discussion boards.
4. Cognition: in learning community, each group makes responses or suggestions to all the other groups.
5. Meta-cognition: doing after responses to curriculum issues

When constructing related web-based learning environments, the following points need special attention: (Lu, 2000)

1. Interactive learning community application: in web-based learning community, the joint of learning companion makes learning activities more diversified. In learning environments, students can be competitors, peer-tutors, as well as peer-tutees.
2. Animated on-line teaching materials: Bruner(1996) brings out that on-line material design should consider the previous experiences and dispositions of students. It should also mimic the authentic situations, be learning activity-centered, and provide dynamic ways of learning.
3. Complete learning routes tracing: the function of teaching and learning management lies in record learning situations in detail. For example, lesson preview unit, learning route, stop time and numbers. (Lu, 2000) Students can arrange their own time, adjust their learning strategies according to their abilities and do planned homework. (Lin, 1993)

Scholar Lin(2000) thinks when constructing a complete web-based learning community, the ideal aspects should include the followings:

1. On-line lessons
   On-line lessons are the main basis for scholars implementing Internet learning activities. The best principles for on-line lessons are constructivism and scaffolding learning theory.
   Constructivism has five elements for curriculum design (Brooks & Brooks, 1995)
   7) Give students an interesting and challenging question
   8) Center learning activities around main learning objectives or concepts; let students get the whole picture
   9) Manage to understand students' points of view, thus, let students express themselves sufficiently and see their perspectives
   10) Adjust the curriculum flexibly to meet students' needs
   11) Evaluate students' learning effect in the teaching situations

In web-based learning community, scaffolding learning theory put highly emphasis on active participation and discussion of learners. There are two ways to provide scaffolded knowledge:
   1) directly present the same learning cases for observation
   2) provide related information for analysis and conclusion. (Henin & Proctor, 1998)

2. On-line tests: on-line tests should be presented mainly in multimedia and should give immediate feedback after examinees finish the tests. It is an advantage of computers, which can enforce learning effects.

3. Virtual classroom: web-based cooperative learning community is a place for learners and teachers to interact. Learners can use it to discuss, observe, and cooperatively learn, while teachers can do consultation of learning.

4. Teaching management: the main purpose of teaching management is to record learners' learning information in order to provide a basis for teacher evaluation and consultation.

5. Learning tools: Learning tools are the aids provided for learners in web-based learning community. The most common one is on-line notebook for learners to jot down learning reflections anytime they want.

Synthesize from the above, we can conclude the following references:

1. Build interactive leaning communities: learning environments are created for participants. In the learning community, learners are always the "protagonists". The investment of all kinds of resources is for the purpose of seeking change to increase
4. with the curriculum, we record learners' learning to provide advanced personalized consultation. The management mode can also process statistics of test results and analyze personal and the groups learning effects. All kinds of e-mails records and discussion boards records are included in the management mode.

5. Flexible curriculum design and material production: we have multiple choices in the curriculum design. We can also use the network multimedia to provide information-on-demand for learners.

6. Dynamic learning resources: in accordance with on-line lessons, all kinds of learning handbooks and on-help information are provided. Related topics of learning resources are integrated using hyperlink to provide learners extra references.

V. The development mode of web-based cooperative learning community

Cooperative learning community not only puts emphasis on individual differences, but also group learning. Via new forms of transmission, on-line teaching can provide an environment for web-based cooperative learning. Students cooperate to learn, and with the sharing of resources, their learning effects can be strengthened. Thus, we develop a web-based cooperative learning community mode. (See Figure 2)

XI. Conclusion

In the environment
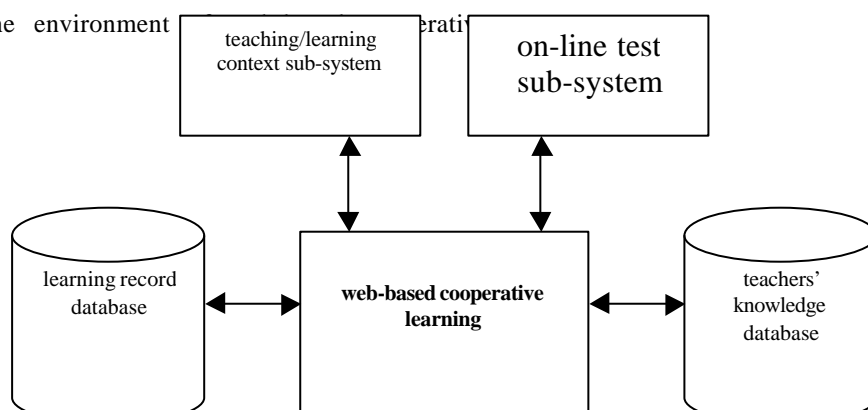
the learning effects in every interaction.

2. Build public news forum: open forums can encourage learners to express their opinions bravely. Others can also learn different cognitions from classmates' points of view.

3. Build teaching/learning management mode controlling the learning process: in accordance learning community, interaction between human and machine is mainly the scope of individual learning, and it emphasizes the grasp of concentration and personal differences. Via the application of Internet learning environment, learners are not restricted by time and space, and they are here together to organize a learning community with aidentical goal of learning.

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Figure 2  The development mode of web-based cooperative learning community