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Using New Technologies to Support Collaborative Learning for College Students

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Abstract

The study creates collaborative learning environments with Mind Map, Blog and Wiki based on the curriculum named learning science and technology. Participants are 117 college students from Ningbo University. Case study and Questionnaires reveal using new technologies can support collaborative learning for them and improve their collaborative awareness and capability. In addition, learning technologies brings about the cognitive load in the learning process so that collaborative learning is not deep enough.

Index Terms: collaborative learning; technologies; college students

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1. Introduction

Higher Education in China is mostly driven by examinations, leading college students to spend most of their time on diligent self-study, being isolated from partners. When leaving school or college, students are faced with the specter of unemployment as many employers prefer to hire employees with several years of collaborative work experience, especially collaborative work with new media technologies in globe. Thomas L.Friedman names this phenomenon which the world is flat [1].

All in all, students should understand other people and actively seek cooperation. The responsibility of higher education is to provide collaborative opportunities for them going beyond classroom learning and let them work as scientists, writers, historians, artists or problem solvers etc... They can construct themselves knowledge on the depth of understanding the world with new technologies to support collaborative learning.

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From 2006, we have conducted a curriculum named learning science and technology to enhance their collaborative awareness and capability, not only learning computer and network skills for them. We try to make the course experimental research base where college students and educator can have collaborative learning experience based on new technologies [2].

2. Method

2.1 Setting research objective

College students should learn to use new technologies to construct digital learning environment for their collaborative learning and inquiry learning.

2.2 Implementation of the research process

2.2.1 Preparation phase: building team of collaborative learning and selection of research topics based on Mind Map

Learning objectives of the course not only require students to understand and master the learning of knowledge, methods, and techniques, but also really understand learning changes that occurred in the information age. They should learn to use learning theories and technologies to guide their work and development, which can reflect on their learning experience and show learning styles, characteristics and personality so that they can play learning strengths and overcome learning disabilities.

As the course involves a wide range, there is a problem what we taught. At first, let them know learning model on the course based on the team work with new technologies, and then we introduce some general introduction about the course and relatively new research field combined with the characteristics of the course in order to provide some basic content and choice of research topic for them.

At the same time, students started to build teams according to their interests and hobbies, and scale of the team is 4 to 7 students. Then they named their team, selected research topics, elected leader, and assigned tasks for every member. This process requires frequently communication between them, but it is very difficult to focus on topics and remember what each member talks about. Even the secretary records all the contents of the conversation and accumulates a lot of text; they often do not know what they have been talking about at last.

Mind Map is a powerful graphics technology which is inspired from all directions to the functioning of the brain cortex with words, images, numbers, logic, rhythm, color and spatial awareness, etc. Its greatest feature is the diverseness to make a discussion, negotiation atmosphere easier, and its record of strong non-linear way of thinking easily provokes sparks and creative ideas to create value. It is conducive to study and problem-solving. As Tony Buzan says that Mind Map is the ultimate organizational thinking tool, it can change boring information into color, easy to remember. There is a high degree of organizational chart. It handles things similar to our brain processing [3].

So we introduces the basic knowledge and using method of Mind Map to them, then we encourages teams to discuss with the help of Mind Map. They are required to express the process of building collaborative learning team and selection of research topics based on Mind Map. It makes students activities become effective and interesting. When encounters problems, they are asked to write them down in the center of a piece of white paper, and every one puts down keywords, or symbols of their own ideas or solutions to problems, recorded in the branch on the theme. They could continue to add up their ideas in the sub-branch around the theme from beginning to the end. This process also helps to mobilize the enthusiasm of their discussion, and encourage those who are shy away from expression to participate in the collaborative work.

2.2.2 Collaborative phase: using blog and wiki to support collaborative learning process

A blog is a type of website or part of a website. Blogs are usually maintained by an individual with regular entries of commentary, descriptions of events, or other materials such as graphics or video. ...Most blogs are interactive, allowing visitors to leave comments and even message each other via widgets on the blogs and it is this interactivity that distinguishes them from other static websites [4].The feature is in line with learning environment advocated by constructivism, which argues humans generate knowledge and meaning from an interaction between their experiences and their ideas. ...it is an interaction between their experiences and their reflexes or behavior-patterns [5].

In the actual teaching process, we develop a course's blog. Educator creates his blog where he presents some successful cases of collaborative learning, curriculum resources, and learning tasks for students, and then requires students to create their one team's blog. Educator links their blog to his own so that he can get feedback on team learning performance in time.

After team's blog were created, every member expressed viewpoint on successful cases of collaborative learning from various perspectives. As a team named "feeling season" says, they learned how to introduce their members, how to assign tasks and set goals to urge members to fulfill its mandate effectively, and how to do summary of their work at end of the semester. Through the study of model and writing blog together, students enhance their understanding and spirit of cooperation and improve the skills of blog.

As the students are familiar with learning model, we requires them to release a preliminary research plan which includes research topics, study motivation, research methods, resources required, and task allocation for their reflection on selection of topics deeply. Educator and other students also give comments for improving their performance.

Wiki is unusual among group communication mechanisms in that it allows the organization of contributions to be edited in addition to the content itself [6]. Wiki can focus on building a collaborative working environment to support students learning through communication, collaboration to create and solve problems.

In order to enable students to fully experience the online collaborative work, we require each team to create a team's wiki. Members can edit entries, and these changes will be documented around their research topic. In the actual teaching process, we adopt Zoho Wiki, developed by ZOHOO Corporation. It enables educator to create interactive online course content for students and insert dynamic content like videos, presentations, reports and graphs to make regular subjects more interesting. With Zoho Wiki, students created dynamic team portals to share work online with different teams and partners. They came together, collaborated on the project and shared their knowledge, uploaded, stored and accessed important documents online [7].

2.2.3 Evaluation phase: using new technologies to report on team collaboration's performance

How do we evaluate team work's performance? Prof. Slavin thinks that collaborative learning is that students in the group in a series of learning activities based on their performance throughout the team reward or recognition [8].This practice is evaluated along three dimensions. The first dimension is the collaborative process where students understand the views of others and actively seek cooperation. The second dimension is effects of using new technologies to support the extent and effectiveness of team collaborative process. The third dimension is the results on team collaborative work including the research topics whether it makes sense, methods of inquiry, blog and wiki updates, and how well the task is completed.

After working hard for a semester, the collaborative learning of team achieves some results. A panel report is held at end of the semester. They discuss the team reports in the form of Mind Map, release reporting initiative with team's blog, co-edit and present the results with zoo wiki.

3. Results

3.1 Case study

Take a team named “Twilight Chapter Seven” for sample, which is drawn from a class of 34 students at Ningbo University and finally grows up as an excellent team in technical support. We conduct the specific tracking and recording on the team collaboration, whose spirit gives us the deepest feelings. When we see the name of the team at first, we could not guess the meaning. By searching through Google, we come to know that it is a song by Jay Chou, a favorite singer by the majority of young people. The beautiful song is composed of seven notes required and played coordinating. The team is composed of exactly seven students of harmony with each other. But they didn’t have a clear understanding on their study topics at first, and how to develop and analyze the subject confuse the team. After several discussions and consultations, there was still no progress. Therefore they started to discuss the problem in the perspective of Mind Map [9].

They prepare a large piece of white paper, draw the issues in the central part of the paper, and then distribute each student a pen of his favorite color. Everyone is asked to express their views on the issue, used the keyword or symbol next to the outward extension from the subject. Each member expresses his views to complement and gives the reasons. Students find this approach very fresh and interesting, so they are quickly adapted to the ways and begin to discuss actively. Because everyone holds a different color pen, it could show the views of everyone. At the same time, they keep looking at the painting and talking about the relationship between the issues. After discussing for an hour, they decide to develop a website for teaching and learning with the wiki concept, which are innovation and a challenge for them. Then they are to make a plan and divide tasks. Furthermore, we find a strong leadership team captain who Linfeng.Long would like a symphony conductor conducted a beautiful orchestra.

This case proves the mind map a systematic presentation of knowledge, visual organization in the process of problem solving. It can help students learn more effectively and clarify the mandate and objectives. It encourages to think aloud with its divergence and effective visual symbol, and to contribute to creating a new, equal consultations fun learning environment. It is with this unique form of communication and visual communication process, the team emerges from the initial confusion and perplexity, which defines the research objectives and corresponding research projects and programs.

3.2 Questionnaire Survey

The quantitative data source includes student’s survey related to collaborative learning, application of new technologies, learning attitude, teacher behavior to explore the impact of teamwork [10].

The survey is administered at the end of the semester and quantitative data are collected and analyzed to seek patterns of using new technologies to support collaborative learning for college students.

The participants in this survey are 83 freshmen from Ningbo University. They are willing to change Learning methods to foster collaborative ability and interested in new technologies.

- 83% of students think experimental teaching has enhanced their awareness of using technologies to support collaborative learning; 67% are proficient in using appropriate technology to achieve learning goals; however 33% are not clear which part of collaborative inquiry supported by technologies.
- So educator need emphasize and elaborate on the role of technical in a collaborative inquiry process.
- In the collaborative learning based on new technologies, 81% of the students like to use this approach to change the concept of their learning and are actively willing to work with others in the future.
- 86% students consider themselves actively involved in the activities of team organization and comment. 78% are satisfied with their roles and tasks. 85% explore the process where the confusion appears and are solved through reflection or communication by new technologies.

- 81% thinks that team leader plays role of coordination in the collaborative inquiry. At first time of collaborative inquiry, most of students lack of experience within some teams, so some of the team members do not make any contribution.
- Therefore educator needed to identify problems and guided them out of the difficulties in time.
- More than 80% of students believe they have become accustomed to use technologies to achieve learning objectives.
- In the meantime, 64% hold the view that the technologies for collaborative learning, brings about cognitive load in some extent.
- So educator need to figure out the tools before explaining all the features and to use precautions to assist the students to master the tools of time-consuming.
- Investigation reveals that educator is very influential on team's collaboration. 96% believe that educator should give more guidance on using of technologies in the learning process. 91% think that educator should instruct students how to do research topics more deeply. 78% of students believe that educator need give their feedback by reporting the completion of each task and the score on educator's blog or team's blog in time.

In order to further understand the students experience and feelings of collaborative learning, some students are interviewed.

- “Which technologies are most useful to you?”

Some students consider wiki very useful for them to work together and collaborate on the project and share their knowledge. Team's blog could collect the resources for their project. Other students believe technologies give them greater convenience. Especially when research topics are not clear, they could use Mind Map to support their discussion.

- “What is your greatest feeling on the teaching experiment?”

Some of the students' answers are very interesting. For them, by working together they have learned a lot of learning technologies. Team work is not easy, and needs better coordination. There is variety of ideas in team's work, so students need to coordinate well.

- “What is your power to collaborative learning?”

Some students hope more in-depth knowledge and understanding on their common interest. When they see other teams doing very well, they are inspired by strong ambition to do a good job through hard working.

- “As a team leader, do you think all the members in your team are active? Why are they positive? Is there the existence of conflicts within the team, what it?”

Some leaders say not everyone is positive. Those who are not interested in research topics are not positive. There are no conflicts in team, but some time the views of the discussion are inconsistent. We could adopt better idea of everyone.

- “What do you think are the shortcomings of the teaching experiment?”

Learning time is not enough to fully grasp the technologies, and educator is hoped to give more guidance on identifying research topics where there is a lot of confusion in the process of collaborative learning.

- “What do you think a good team should possess?”

Each member in team work is interested in their research project. Moreover, positive understanding, common goals, clear objectives, mutual tolerance, listening to the views of others, and a cohesive and responsible leader are need.

4. Conclusion

This study is an important complement to the exiting literature in collaborative learning. It breaks the traditional teaching methods in higher education, actively advocates technologies and the construction of the learning environment that combines teaching practice. College students learn to use new technologies to construct digital learning environment for their collaborative learning and inquiry learning. Through

collaborative problem solving, the authenticity of knowledge learning and problem solving migration are increased, and so are their collaborative awareness and capability.

In addition, because the time for learning is short, learning technologies brings about the cognitive load in the process of student learning and collaborative learning is not deep enough.

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