Collaborative Construction of Advance Organizers as A Learning Event for Online Instruction

Wan-Ling Liao, National Taiwan Normal University, Taiwan
Chang-Hwa Wang, National Taiwan Normal University, Taiwan
Yu-Hsuan Chen, Taipei College of Maritime Technology, Taiwan.

Abstract
Instructional strategies for online learning vary from face to face learning in many aspects. However, only a few studies suggested appropriate strategies for online learning. Classic instructional theories such as advance organizer has been proved to be effective for teaching. It is traditionally developed by professional instructional designers. But in a collaborative construction online learning environment, the role for developing advance organizer may shift from instructional designers to the learners.

In this study, we proposed to employ user-developed advance organizer as a learning event after they have learned instructional contents. This instructional event may be considered as a reinforcement for newly learned knowledge. After regular instruction, learners will be asked to develop their own advance organizers collaboratively, and instructor will provide interactive feedbacks during the collaborative construction process.

This study will employ Google Sites to create the collaborative learning environment. Selected topics on Experimental Statistics course will be the subject matter to be taught. Research subjects will be Master's students. They will be assigned to either experimental group or control group and several sub-teams will be formed to perform collaborative works. The difference between the experimental group and control group is that the former uses the collaborative construction of advance organizer to be the reinforcing strategy but the latter uses practice-and-drill type of exercise as the reinforcing strategy. Posttests will be given to both groups to evaluate the learning outcome and investigate the significance of using collaborative construction of advance organizer as reinforcing strategy.

Keywords: advance organizer, collaborative construction, online learning

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Introduction

The concept of advance organizers has been used in education for a long time. Some studies pointed out that advance organizers has a positive impact for learning performance and learning attitudes (Ambard & Ambard, 2012; Jafari & Hashim, 2012). Another study compared the learning effectiveness of different types of advance organizers. Learners not only had a positive attitude but also indicated advance organizers could help them to dismantle the course and emphasize important concepts (Chen & Hirumi, 2007). And the other study explored the effect of visual advance organizers and the result showed that advance organizers could promote the English reading comprehension (Lin & Chen, 2007). During the past 50 years, many aspects regarding the application of advance organizer have been dicussed, including teaching strategies, learning retention, and learning satisfactions.. However, there were less studies paying attention on who should be the designers of the advance organizers.

The Cognitivism include Piaget's cognitive-developmental theory, Vygotsky's social constructivism, Ausubel's meaningful learning theory and Bruner's discovery learning theory. And the similarity argument of these theories are that learners' knowledge is not directly instilled by teachers, but construct their own knowledge through interacting with the environment. However, Lu (2011) mentioned that in recent years, the development of Web2.0 brought a new way of network cooperative learning, so people can participate actively, share resources and create knowledge together. That means people interact with the online environment to build knowledge and become the constructor of knowledge. EIn the constructive online learning environment, the instructional methods as well as the role between instructors and students are very different from the traditional instruction. Learners have more control over their learning while teachers become assistants alongside them.

The purpose of this study is to employ Google Sites to create the collaborative learning environment, and propose to employ user-developed advance organizer as a learning event after they have learned instructional contents. After regular instruction, learners will be asked to develop their own advance organizers collaboratively, and instructor will provide interactive feedbacks during the collaborative construction process. After the online instruction, we will evaluate the learning outcome, learning experiences and investigate the significance of using collaborative construction of advance organizer as a reinforcing strategy.

Collaborative Construction of Online Learning

The concept of the collaborative learning comes from the constructivist teaching, emphasizing that the way of acquiring knowledge is not through the teacher but student take the initiative to learn. The construction of knowledge is not necessarily only an individual process of exploring learning but may be influenced by groups which have a social interaction (Seng & Yu, 2005).Based on the characteristics of collaboration, the network technology Web2.0 provides a new learning channel and collaborative space, and supports the interaction, feedback and maintenance of interpersonal relationship. Some educational researchers believe that Web2.0 system is one of the potential educational technologies which can be used to assist teaching and enhance learning outcomes (Alexander, 2006).

For the past few years, some studies reported that the development of the joint construction of narrative brought a strong dynamic in a social learning environment which allowed learners making lots of knowledge-building conversations (Barron, 2003). The collaborative learning focuses on the real problem situation or learning tasks, leading learners to solve problems or complete their learning tasks, and is considered to be an effective teaching method to promote a form of online learning community (Gersh,2001).In traditional learning, the learning environment was led by teachers. In a constructive learning environment, learners are encouraged to learn from each other, and accommodates a variety of learning styles. In other words, instructors and textbooks will not be the only sources of information.

The Application of Advance Organizer

Ausubel (1960) believed the development of learners' cognitive architecture was derived from reforming materials, combined with their original cognitive architecture, and produce a new cognitive architecture. Ausubel thought that the most important factor was the learner's cognitive architecture to determine whether the new learning materials were effective for learners.

Yang (2006) mentioned that the advance organizer could make a meaningful link between students' past experiences and new knowledge. That is, advance organizer was a bridge between students' cognitive structure and the instructional materials. Prior studies have proved that advance organizer has positive effective for learning outcomes or learning attitudes (Ambard & Ambard, 2012; Hashim, 2002; Chen & Hirumi, 2007; Lin & Chen, 2007).

Chien, Jen and Lai (2011) pointed that the application of advance organizer could make the organization and structure of the teaching more complete, and make students got the point more easily. Li (2009) found that the content of advance organizer must be closely related to the content of learning in his study. Chen, Hirum and Zhang (2007) mentioned there has no obvious effectiveness of advance organizer may because of its loose structure and its guide for use was not detailed.

According the concept of advance organizer and the results of past studies, we can understand the real situation of applying advance organizer in teaching, and help us to develop principles to evaluate advance organizer.

Learning Experience

Based on social constructivism, people work together and complete a task. The aim of constructing knowledge actively is a characteristic of a powerful learning environment. Liaw (2003) mentioned that a web-based learning environment provides students with more equal opportunities for retrieving information and interacting with each other actively because it has appropriate characteristics such as hyperlink networks, and synchronous or/and asynchronous communication.

So and Brush (2008) pointed out that student's perception of collaborative learning would influence satisfaction. Strijbos and Laat (2009) indicated that a greater sense of responsibility can increase an individual group member's awareness to the group's goal and subsequently increase group efficacy. The positive interdependence will be

generated when the performance of a single group member depends on the performance of other members, and it can enhance internal cohesion.

Dewiyanti, Brand-Gruwel, Jochems and Broers (2004) mentioned that students'participation in collaborative learning makes important contributions to group members when they are collaborating to solve a problem or to accomplish a task. And they explained the important elements which may influence studentsparticipation are course characteristics, individual characteristics, different aspects of collaborative learning process and satisfaction.In Liaw and Huang's (2006) study, learners' feelings and learners' attitudes toward a collaborative e-learning environment were investigated. They considered five elements when designing a web-based computer support collaborative learning environment: learners' attitudes, environmental characteristics, environmental satisfaction, collaboration activities, learners' characteristics, and environment acceptance.

In conclusion, there are various types of factors will affect learning experience. In this study, we will integrate these possible factors and modify its contents to develop the measures to examine learners' experience in accordance with our research purposes.

Method

In this study, we employ Google Sites to create the collaborative learning environment. Fundamentals of Experimental Statistics for Master's students will be the subject matter to be taught. Participants will be assigned to either the experimental group or the control group and several sub-teams will be formed to perform collaborative works. After regular instruction, posttests will be given to both groups to evaluate the learning outcome, investigate the learning experiences and the significance of using collaborative construction of advance organizer as reinforcing strategy. Research framework is shown in Figure 1.
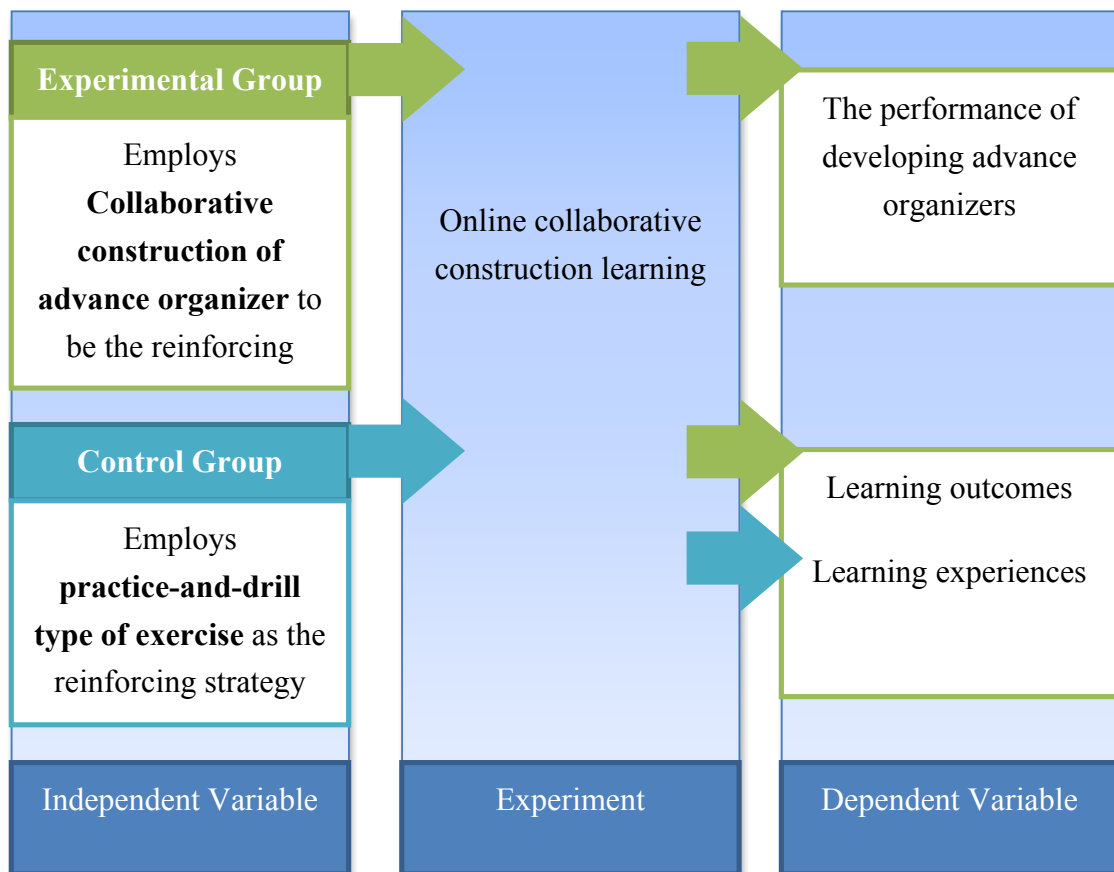
Figure 1: Research framework

Participants

All 26 participants will be Master's students selected from a major university of Taiwan who enrolled for the Experimental Statistics course. They have an average age of 23 and will be separated to 7 groups mixed of males and females. Each group consists of 3 or 4 students. The 26 participants finally form 4 experimental groups and 3 control groups.

Procedure

The major learning events will be designed separately for the experimental group and the control group with equal loads. The experimental group will be assigned to use the collaborative construction of advance organizer, the control group will use practice-and-drill type of exercise as the reinforcing strategy. A 3-week online learning activity is designed for the experiment.

In order to explain the collaborative construction online learning process, an orientation will be given to all participants. At the same day, instructor will introduce the principles of advance organizer to the experimental group and will give the Experimental Statistics pretests to both groups.

In the beginning of the collaborative construction online learning, two groups will be asked to watch some learning questions related learning objectives deigned by instructor on Google Sites. Then they will need to collect materials, share information with their group members, join their group discussions, collaborate and organize their

information and write down the answers blow the questions. At last, the experimental group will need to follow the guidelines to develop their own advance organizers collaboratively and the control group will need to complete an exercise collaboratively. During the collaborative construction process, instructor will provide interactive feedbacks to participants. Learning process of two groups has shown in Figure 2 and Figure 3, and the different learning events had marked in red.
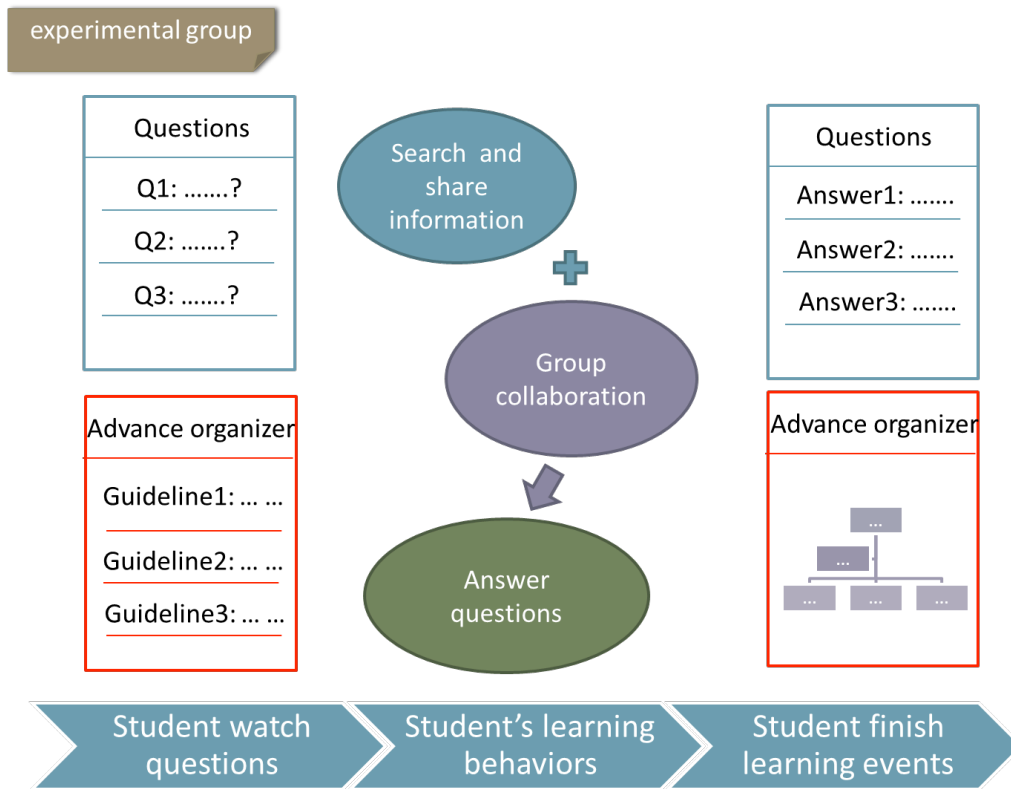
Figure 2: The learning process of the experimental group
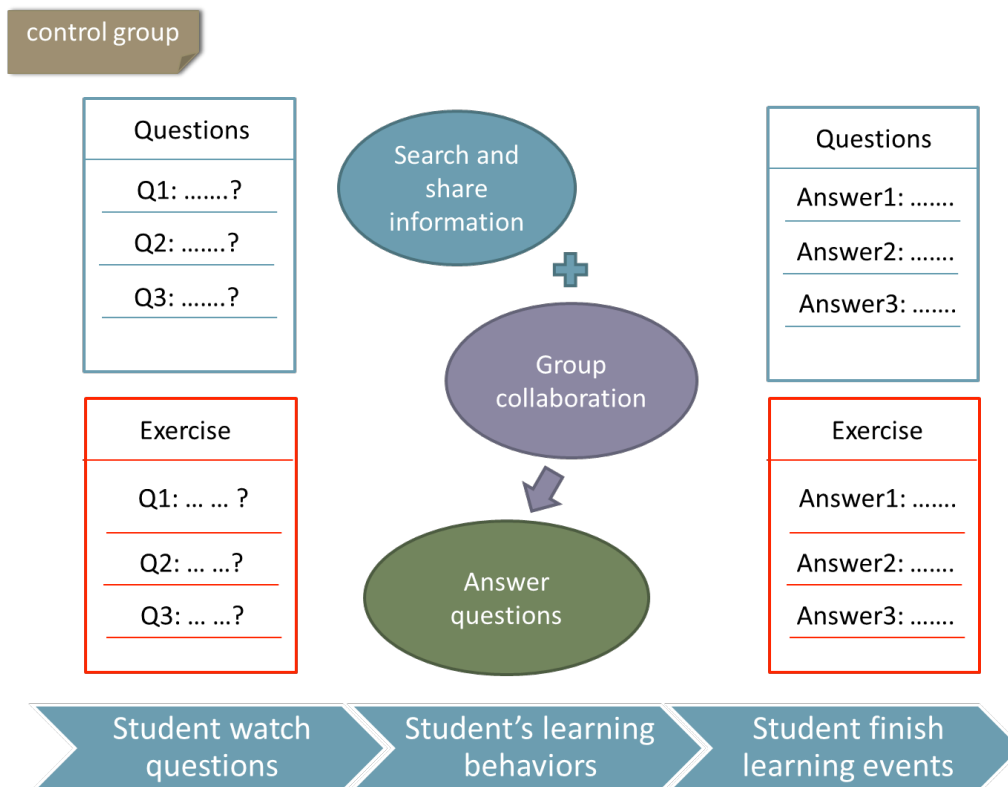
Figure 3: The learning process of the control group

After the collaborative construction online learning, the Experimental Statistics posttests and the questionnaire of learning experience will be given to both groups. And then will invite three experts to evaluate the questionnaire for the performance of advance organizer.

Instrument

Questionnaire for advance organizer is designed to examine the performance of the advance organizer developed by each experimental group. This questionnaire consists of two variables, the content and structure of advance organizer. There are about five questions in each variable. The format of all questions is a Likert-type scale, ranging from 1 (strongly disagree) to 5 (strongly agree).

Questionnaire for Experimental Statistics test with 21 questions is designed to examine the variety of students' academic achievements during the collaborative construction online learning. Questions are designed according to the teaching objectives and learning contents.

Questionnaire for learning experience with about 36 questions is designed to evaluate how students feel and experience during the collaborative construction online learning. It consists of five variables including the environmental characteristics, environmental satisfaction, individual characteristics, collaborative learning experiences, collaborative learning satisfaction. The format of all questions is a Likert-type scale, ranging from 1 (strongly disagree) to 5 (strongly agree).

In order to gain a deeper understanding of learners' true feelings and learning difficulties in the collaborative online learning, we will develop a semi-structured interview outline according to research problems. It consists of three variables including the performance of collaborative construction, learning experience and learning event.

Expected Result

This paper proposed an innovative learning strategy for collaborative construction online learning that may enhances the effectiveness of learning. Although this research is still ongoing, we expect that the following questions may be answered:

1. Is there an impact on learning outcomes while the role for developing advance organizers shifts from instructional designers to the learners?
2. Would there be a relation between the performance of advance organizers developed by learners and their learning outcomes?
3. What are learner's perceptions and experiences during this collaborative construction of online learning?

This work expects to provide teachers with applicable strategies for designing collaborative construction of online learning. In the future works, instructional designer can focus on how to enhance learner's learning motivation or compare the effects of using different types of advance organizer as learning strategies.

Acknowledgements

References

Alexander, B. (2006). Web 2.0: a new wave of innovation for teaching and learning? *EDUCAUSE Review, 41*, 32-44. Retrieved September 8, 2010, from http://www.educause.edu/ir/library/pdf/erm0621.pdf

Ambard, P. D., & Ambard, L. K. (2012). Effects of narrative script advance organizer strategies used to introduce video in the foreign language classroom. *Foreign Language Annals*, 45(2), 203-228.

Ausubel, D. P. (1960). The use of advance organizers in the learning and retention of meaningful verbal material. *Journal of educational psychology*,*51*(5), 267.

Barron, B. (2003). When smart groups fail. *Journal of the learning sciences, 12*(3), 307-359.

Chen, B., & Hirumi, A. (2007). Investigating the use of advance organizers as an instructional strategy for web-based distance education. *Quarterly Review of Distance Education*, 8(3), 223-231.

Chen, B., Hirumi, A.& Zhang, N. J. (2007). Investigating the use of advance organizers as an instructional strategy for web-based distance education. *Quarterly Review of Distance Education, 8*(3), 223-231.

Chien, F. M., Jen, C. I. & Lai, Y. L. (2011). Effectiveness of collaboration in exploratory teaching project between university and elementary school: a case for social studies. *The Journal of Regional and Social Development Research, 2*, 1-36.

Gersh, S. O. (2001). Technology's role in creating the shared learning environment. *Multimedia Schools, 8*(5), 48-51.

Hansen, L. M. (2002). Defining inquiry: exploring the many types of inquiry in the science classroom. *The Science Teacher, 69*(2), 34-37.

Jafari, K., & Hashim, F. (2012). The effects of using advance organizers on improving EFL learners' listening comprehension: a mixed method study. *System: An International Journal of Educational Technology and Applied Linguistics*, 40(2), 270-281.

Li, C. H. (2009). The use of advance organizers to prepare college students to listen in the foreign language classroom. *Taiwan Journal of TESOL, 6*(1), 83–110.

Liaw, S. S. & Huang, H. M. (2006). *Investigating Learner Attitudes toward a Collaborative E-Learning System*. Proceedings of the 10th International Conference on Computer Supported Cooperative Work in Design, 1-5. IEEE.

Liaw, S. S. (2004). Considerations for developing constructivist web-based learning. *International Journal of Instructional Media, 31*(3), 309-321.

Lin, H., & Chen, T. (2007). Reading authentic EFL text using visualiazation and

advance organizers in mutimedia learning environment. *Language Learning & Technology*, 11(3), 83-106.

Lu, P. C. (2011). A study on the Influence of blog learning communities on undergraduates' knowledge constructions in arts general curriculum. *Journal of Research in Education Sciences, 56*(2), 137-174.

Seng, J. L. & Yu, M. S., (2005). An adaptive, collaborative, and constructive interaction design in e-learning. *Electronic Commerce Studies, 3*(4), 331-358.

So, H. J. & Brush, T. A. (2008). Student perceptions of collaborative learning, social presence and satisfaction in a blended learning environment: Relationships and critical factors. *Computers & Education, 51,* 318-336.

Strijbos, J. W. & Laat, M. F. D. (2010). Developing the role concept for computer-supported collaborative learning: an explorative synthesis. *Computers in Human Behavior, 26*, 495-505.

Yang, L.L.(2006). Implement of didactics and reception learning. *Research and Development in Science Education Quarterly,* 61-74.