

Benefits of Using Computer Based Cooperative Learning in Science



Education

KEYWORDS :

Anuradha Sekhri

ABSTRACT

The present paper highlights the benefits of computer based cooperative learning based on its theoretical relevance to the science classroom. Light will be thrown on the significance of the cooperative learning in science, in addition to focusing on computer based cooperative learning which could make a difference in the learning process of science learners. This paper highlights advantages of cooperative learning and integration of technology with cooperative learning. The paper concludes with role of teachers in cooperative learning classroom and social benefits of cooperative learning. Cooperative learning can help students develop skills in communication and improve their motivation to learn. Cooperative learning also has positive effects on student achievement, increases student relationships and increases self-esteem. These benefits of cooperative learning help learners improve efficiency. Cooperative learning is an effective teaching strategy in science teaching. It fosters positive attitude in the students, such as cooperation, tolerance and trains students to express or convey ideas.

Introduction

Computer based cooperative learning can be effective for delivering content to students and for instructors interacting with each other in a face to face classroom using communications tools such as email, conferencing system, whiteboards, chat rooms and video conferencing and it can deliver content in multimedia format like a video on demand, audio clips, animations, simulations and movies also. Computer based learning can support for all educational levels and can be useful for formal and non-formal education. So, learning activities should be planned in such a way that educators must integrate utter technology and cooperative learning when students are actively involved in sharing ideas and work cooperatively to complete academic tasks. In order to enhance learning, technology must promote cooperation among students and create a shared experience. Cooperation is working together to accomplish shared goals. Within cooperative situations, the individual seeks outcomes that are beneficial to themselves and beneficial to all other group members. Cooperative learning is the instructional use of small groups so that students work together to maximize their own and each other's learning (Johnson, Johnson & Holubec, 1998). It also observes the perception that cooperative learning dramatically improves student's academic accomplishment (Faryadi, 2007).

Accordingly, the integration of telecommunication and computer technologies is expanding the classroom beyond their walls. The technologies, therefore, allow those individuals who wish to continue their education more readily wherever they are regardless of their life responsibilities which might have prevented them from attending classes at the university or college location. Thus, location and time no longer serve as deterrents to continuing education. With the availability of these technologies, learning is no longer encapsulated by time, place, and age, but has become a pervasive activity and attitude that continues throughout life and is supported by all segments of society (Kozma & Schank, 1998).

Characteristics of Cooperative Learning

According to Kagan (1989), cooperative learning can include team development activities: (a) Cooperative classroom atmosphere through class building activities. (b) Special training in social roles and social skills. (c) Specialized tasks for teams. (d) Special scoring, recognition and reward systems structured for individuals, teams and classes. He also describes the five key elements which define characteristics of cooperative learning:

- (i) *Team formation* teams of 2-4, with students of different abilities, mixed ethnicity, gender.
- (ii) *Positive interdependence* the gain of one student is associated with gains for other students; team has same goal; posi-

tive interdependence can take several different forms.

- (iii) *Individual accountability* contributes to academic gains; contribution of each individual is made known to the team; can take several forms: reward accountability (i.e. team grade based on individual test scores), task accountability (i.e. each student accountable to group for her portion of the project).
- (iv) *Social skills* are developed and practice based on the structures used; students can learn how to listen to each other, resolve conflicts, set and revise agendas, keep on task, and encourage each other; time devoted to review group process which can be done individually and as a team, i.e. did we help each other? Did we ask for help if we needed it? Did we all participate?
- (v) *Structuring and structure* a critical component; task structures are created when no one individual can complete the learning task alone (e.g. think-pair-share, jigsaw, round robin paraphrasing, group products); reward structures are created by making grades dependent on each other (e.g. team scores are a sum of the improvement scores of individuals).

Linking cooperative learning to science

Cooperative learning allows teachers to achieve at least three major instructional objectives listed in the National Science Education Standards (NRC 1996):

1. Cooperative learning improves students' thinking and helps them construct their own understanding of science content by strengthening and extending their knowledge of the topic. The sharing of ideas allows students to explore, refine, and question new ideas
2. Cooperative learning promotes student involvement and engagement. Research often shows that for true learning to occur, students must take responsibility for their own learning and not depend solely on the teacher. The use of cooperative learning supports this outcome and provides all students with public opportunities to make their thoughts visible to others by allowing them to talk about and consider their own as ideas as well as those of others
3. Cooperative learning aids in the development of important communication skills and scientific thinking processes. Cooperative techniques provide the social settings in which teachers can help students analyze their thinking processes and encourage all students to interact with their teachers and peers in a way that is conducive to science learning.

Teacher's Roles:

In a cooperative learning class, teachers are facilitators who should guide their learners on how best to achieve educational objectives (Zhang, 2010). Teacher talking time should be less than student talking time (Jacob, 2006). Teachers also are re-

quired to provide their learners with a model answer to encourage further learning (Harel, 1992). The role of the teacher is very important in cooperative learning. To have an effective cooperative learning group teachers must know their students well. Grouping of students can be a difficult process and must be decided with care. Teachers must consider the different learning skills, cultural background, personalities, and even gender when arranging cooperative groups. Much time is devoted to prepare the lesson for cooperative learning. However, teachers fade in the background and become a coach, facilitator, or and sometimes a spectator after the lesson is implemented. Teachers who set up a good cooperative lesson teach children to teach themselves and each other. Students learn from their peers and become less dependent on the teacher for help.

In a cooperative learning teachers have to be involved when they are needed. Their help must be relevant and encouraging. Study found that "The teacher's role in cooperative learning generally includes (a) specifying objectives, (b) grouping students, (c) explaining tasks, (d) monitoring group work, and (e) evaluating achievement and cooperation (Ding, Li, Piccola, & Kulm, 2007).

Benefits of Cooperative Learning

Cooperative learning produces greater student achievement than traditional learning methodologies (Slavin 1984). Slavin found that 63% of the cooperative learning groups analyzed had an increase in achievement. Students who work individually must compete against their peers to gain praise or other forms of rewards and reinforcements. In this type of competition many individuals attempt to accomplish a goal with only a few winners. The success of these individuals can mean failures for others. There are more winners in a cooperative team because all members reap from the success of an achievement. Low achieving students tend to work harder when grouped with higher achieving students. There is competition among groups in cooperative learning. Some forms of group competition promote cohesiveness among group members and group spirit. Cooperative learning has social benefits as well as academic. One of the essential elements of cooperative learning is the development of social skills. Children learn to take risks and are praise for their contribution. They are able to see points of view other than their own. Such benefits contribute to the overall satisfaction of learning and schooling. Students work with classmates who have different learning skills, cultural background, attitudes, and personalities. Heterogeneous groups promote student learning. These differences forces them to deal with conflicts and interact with others. Social interaction improves communication skills that become a necessity to functioning in society.

Conclusion

Cooperative learning provides the opportunity for students to learn academic skills and care about the feelings and needs of others in their groups. It requires that students assume responsibility for themselves and for the success of the group. Cooperative learning is promising. The promise is to encourage students to learn actively and constructively. In a cooperative atmosphere the role of the teacher is different. He/she does not act as

a sole deliverer of knowledge, but a friend and a helper in time of needs. In a cooperative learning teachers have to be involved when they are needed. Their help must be relevant and encouraging.

REFERENCE

- Ding, M., Li, X., Piccola, D., & Kulm, G. (2007). Teacher intervention in cooperative-learning mathematics classes. *The Journal of Education Research*, 100 (3), 162. Jacob, G. M. (2006). Issues in implementing cooperative learning. In S. G. McCafferty, G. M. Jacobs, & A. C. DaSilva Iddings (Eds.), *Cooperative learning and second language teaching* (pp. 30-46). Cambridge: Cambridge University Press. Johnson, D. W., Johnson, R. T., & Holube, E. J. (1998). *Cooperation in the classroom*. Boston: Allyn and Bacon. Kagan, S. (1989). *Cooperative learning resources for teachers*. San Juan Capistrano, CA: Resources for Teachers. Retrieved Dec 17, 2015 from http://charactered.ode.us/ICE/lessons_html/cooperative.html#top Kozma, R., & Schank, P. (1998). Connecting with the 21st century: Technology in support of educational reform. In C. Dede (Ed.), *Learning with technology*. Alexandria, VA: Association for Supervision and Curriculum Development. Retrieved January 19, from 2013. <http://pedagogy21.pbworks.com/Technology+and+the+Educational+Process.pdf> National Research Council (NRC). 1996. *National science education standards*. Washington, DC: National Academy Press. Retrieved Dec 17, 2015 from <http://www.nsta.org/publications/news/story.aspx?id=52116> Faryadi, Q. (2007). Enlightening Advantages of Cooperative Learning. Retrieved Dec 17, 2015 from <http://files.eric.ed.gov/fulltext/ED495702.pdf> Slavin, R. E. (1984). Component building: A strategy for research-based instructional improvement. *Elementary School Journal*, 84, 255-269. Zhang, Y. (2010). Cooperative language learning and foreign language learning and teaching. *Journal of Language Teaching and Research*, 1(1), 81-83. List of sites consulted http://alumni.media.mit.edu/~andyd/mindset/design/cle_rsched.html <http://www.westeastinstitute.com/wp-content/.../wafaa-salem-Full-Paper.pdf> <http://pedagogy21.pbworks.com/.../Technology+and+the+Educational+Process>.