Effect and use of Collaborative Learning: a Review

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Abstract

Collaborative Learning (CL) is a very important strategy to foster critical thinking, learner's autonomy, self-decision among the students. It does not just mean doing the project in a group, but it is a highly advanced level of psychological situation, which triggers the latent mentle faculties among the participants. It needs expertise to implement it in our classrooms. To understand how collaborative learning situation goes on in a class (virtual/face to face) we have reviewed the research work done in the field of collaborative learning, holding the specific objectives to find out: (i) the effects of collaborative learning on teaching learning process; (ii) the use of various collaborative learning strategies; (iii) various methods to access and analyze collaborative process and interaction patterns; (iv) online resources for collaborative learning. The review briefs the results of various studies revealing the benefits of collaborative learning to improve the four skills of language, to promote self-efficacy, motivation, critical thinking and to develop sense of community, among both the teachers and students. Various methods and techniques for collaboration and in depth analyses of the interaction patterns and characteristics has been discussed. Various online resources such as, Google Docs, Cloud Services, think Lets, class blog etc. has been explored. The studies also revealed the importance of interaction in collaborative learning.

KEYWORDS: collaborative learning techniques, interaction patterns, online collaboration, constructivist learning, self-reflection, innovation, team-work.

1. Introduction

The quality in education marks the growth of a nation. In 21st century the learner needs to become more critical, an independent thinker; but at the same time he must be able to work in teams, as a problem solver in a team. Collaborative learning serves the maximum to the purpose. It gives you freedom and autonomy to learn independently and creating new things, while learning and growing with your team members at the same time. The research work has been in progress to see the effects of collaborative learning in the classroom.

The concept of collaborative has its roots in our own social set up. We grow up together in our social group, learning from each other. The deepest core of our intellect is stimulated when we interact, discuss and work with others. But this may not happen when working alone. Psychologists, realizing the importance of collaborative learning, are keenly involved in knowing the most productive techniques of applying collaborative learning into the classroom; be it in a classroom of a traditional setting, a computer supported or entirely a virtual environment.

Dillenbourg (1999) says that "collaborative learning is a situation in which **two or more people learner** (a pair, a small group, a class, a community, a society …and all intermediate levels) attempt to **learn something** (follow a course, study course material, perform learning activities such as problem solving) **together** (face-to-face or computer mediated, synchronous or not)."

Thus, we can say that online collaborative learning includes building and sharing knowledge by the learning groups using asynchronous or real time communication network via computers.

2. Objectives of the Study

In the present study, the investigators have reviewed the research work done in the field of collaborative learning, holding the specific objectives to find out: (i) the effects of collaborative learning on teaching learning process; (ii) the use of various collaborative learning strategies; (iii) various methods to access and analyze collaborative process and interaction patterns; (iv) online resources for collaborative learning.

3. The Review

For the review of literature the researcher selected mainly the four online sources: (i) Springer Journals; (ii) Shodhganga; (iii) Proquest and; (iv) Eric.

3.1. Effects of Collaborative Learning on Teaching Learning Process

The researchers in the first section discuss the studies stating the effects of collaborative learning on students, teachers and on the teaching learning process.

3.1.1. Facilitating students' project work

Collaborative learning can facilitate students' project work, as reported by Cheung, Leung and Leung (2015), whose study reported that the students' daily project works can be facilitated by including online communication tools. They liked to collaborate via WhatsApp and Moodle.

3.1.2. Learning English through collaboration

Sricot (2010) showed that collaborative learning improved the understanding of English reading comprehension of the students, learning of the vocabulary and the ability of writing the summary in English. Similarly, Shahamat and Mede (2016) reported that collaborative learning bear positive effects on the teaching learning process of English language classroom of fifth class. Collaborative learning acts as a facilitator in the public speaking course as reported by Ann (2014). It also benefited the most the "African American students, Hispanic American students, and students whose mother had no more than a high school education" Ann (2014). Collaboration improves the reading comprehension as Fall et. al. (1997) summarized "students who discussed the story improved their understanding of facts and their interpretations".

3.1.3. Effect on Loneliness among children with disability

Bansal (2014) found collaborative learning as helpful in reducing loneliness. It was found that the impact of strategy was longer in duration in inclusive schools after the treatment was withdrawn as compared to the experimental group of special schools.

3.1.4. The Efficiency of Online Collaborative Learning

Andrea et. al. (2008) reported "asynchronous collaborative learning online can increase professional competences". In contrast, Lynn's (Lynn, 2014) investigation did not indicate a statistically significant difference in student performance using an online social networking platform, hosted through Wiki space.

Exploring in the similar line, Mercer (2002) indicated that "synchronous communication tools was superior to asynchronous CMC used alone to support group collaboration. It provided a learning environment more like face-to-face".

3.1.5. Establishing Sense of Community

Strauss and Corbin (1998) showed that students recognized their sense of community by having a sense of co-producing through collaboration. When a sense of community was developed, students felt more at ease in working in teams, advanced sense of accountability, and formed confidence in their team members. Students develop "sense of community" by accomplishing common goals together.

3.1.6. Constructivist Learning

Raval (2102) studied the effectiveness of Constructivist Approach on achievement. After the manipulation of the program, CIP was found effective as compared to traditional approach, both in boys and girls as compared to traditional approach.

3.1.7. Collaborative Learning for Teachers' Professional Development

Minjeong and Kyunghee (2014) reported that collaborative professional learning activity assisted the teachers in their growth and learning as professionals. "Collaboration among teachers was proved successful by Doppenberg, Bakx and Brok (2012) who identified that teachers can learn a great deal through "high quality team meetings."

3.1.8. Stakeholders Team up

Collaborative learning can be a great help to build up parent-child relationships facilitating growth at both ends. Jeffs (2000) found that "parent/child dyads working together in literacy skill development" began to learn from each other and from the technology. Similar to Jeffs, Samantha (2016) goes a step further and evaluated Family-School Collaboration with Culturally and Linguistically Diverse Families and found that when parents are involved in their children's academic and school life, children experience improved language achievement.

3.1.9. Feelings of Frustration among Online Learners

Besides the several benefits of collaborative learning strategies, it can generate frustration among the learners. "The perception of an asymmetric collaboration among the teammates was identified by the students as the most important source of frustration" reported by Neus and Margarida (2012). Their study says that there were many

challenges faced by online learners such as groups were not properly managed, more sense of goal sharing among group members was needed".

Conclusion

The above discussion revealed that including collaborative learning strategies into the teaching learning process can bear fruitful results. It has proven the most beneficial to improve all four skills of language, such as skill of reading, of writing, of listening and skill of speaking. Collaboration among learner promotes learner self-efficacy, motivation, and performance, establishes their sense of community and helps removing feelings of loneliness. Among teachers also it fosters self-reflection and critical attitude to analyze their own teaching. However, studies found that online collaborative learning leads to frustration among the participants.

3.2. The Use of Various Methods and Techniques for Collaborative Learning

To make collaborative learning a success, it should be supported by various collaborative methods and techniques. In this section the researchers discuss the studies that showed how collaborative learning can be assisted and amplified through various methods and techniques.

3.2.1. Diagrammatic representations in collaborative learning

Amelsvoort et. al. (2007) found that diagrammatic representations may perk up collaborative learning, except when used in a co-constructive way. The learning pairs who involved in serious discussion utilized their presentations as a base for knowledge building benefitted more, in comparison to pairs who involved in only surface conversation.

3.2.2. Students' Collaborative Skills in Open Innovation Environment

Oganisjana (2015) found that although the learners were optimistic to carry out in an environment where they would be given with the probability to use a range of means for collaboration and co-initiation: (i) they showed an attitude to work mostly in "small close circle of participants" with their team mates and teachers; (iii) the participants mostly preferred to work within their own groups and were not very open to the collaboration with other groups; (iv) there was a dearth of enthusiasm and receptivity to collaborate with people from outside.

3.2.3. Mobile Learning

Hernando et. al. (2014) highlighted the latent qualities of mobile learning as an evolving educational means that is proficient of supporting and nurturing the teaching-learning process. Alejandro and Mendoza (2014) concluded that "Mobile Phone-Mediated Collaboration (MMC) via LINE, an instant message function on smart phones, have great ability to enhance interaction in online collaboration as compared to CMC via Moodle forums, a virtual learning system on desktop computers. Chung, Lee and Liu (2013), also explored the peer interactions assisted by two collaborative programs: one with mobile computers and the other with "shared-display groupware (SDG)". Results favored SDG as being helpful in supplementing face-to-face peer dealings supported by mobile computers.

3.2.4. Assessment in Collaborative Learning

Brindley, Walti and Blaschke (2009) found assessment not very strong element to increase learner participation. The authors suggest that instead of focusing on the scoring of collaborative group tasks, teachers should include a mixture of instructional strategies to make the quality of group work better and to amplify the probability of student involvement. Pozzi et. al. (2016) showed that students who carried out the Peer Review (PR) in groups were less active from the cognitive point of view, while they devoted more effort to deal with organizational matters and discourse facilitation. And study by Ferrer and Cano (2016) analyzed a practice of formative peer-assessment and showed positive effects on the involvement, motivation and learning perception but not on performance improvement".

3.2.5. Obstacles and Remedies in Collaborative Learning

Tracie and Theresa (2009) discussed various obstacles in collaborative learning activities. As per their reports, students feel reluctant about group grade and not getting full credit they have done more work in comparison to their team mates. But those who support collaborative learning say that it teaches students to be helpful to others and sharing responsibilities and team work for future jobs.

Conclusion

A teacher who is using collaborative learning in their class must know and equip themselves to use various collaborative learning strategies. The studies discussed above give us a fair list of such methods and strategies. The use of diagrammatic representations, open innovation environment and Mobile learning in collaborative learning was proved useful. Whereas, assessment and peer review tasks didn't stand strong to support collaborative learning, however bears positive effects on involvement.

3.3. Collaborative Processes and Interaction Patterns

To master the collaborative learning techniques, we need to dive deep to understand the processes and interaction patterns involved in collaborative learning. In this section, the studies reporting various methods to access and analyze collaborative process and interaction patterns are discussed.

3.3.1.Levels, Patterns and Characteristics of Interaction

Ngah (1994) discussed that the students' interactions occurred at many levels in the course. At the lowest level of interaction, there was the "participative monologue" where students gave their views without "listening" to others on-line. There were also examples of "one-time dialogue", where a communication occurred between two participants only once, and then stopped. At the highest level, there was display of "interactive communication" where many students interact, negotiating on a common issue. Baez, Henning and Segovia (2013) found that team work was an area in need of improvement Forums, chats and other interaction spaces should be examined closely to study the types of discussion proposed, the substance of those discussions, methods of working together, and the division of roles and tasks.

Three collaboration characteristics: interdependence, independence and synthesis were introduced by Muuro, Oboko and Wagacha (2016). The findings inform that it provides a

learning experience to students with poor individual learning skills to improve their learning through group learning.

Oliveira, Tinoca and Pereira (2011) studied the different types of group work practices in online courses and revealed that the more and less successful groups, evidently revealed distinguishing design of work, specified "by negotiation, research, conception and production". Jahng, Nielsen, and Chan (2010) analyzed students' interactions during whole-group discussions and small-group activities. The results indicated that students' involvement patterns were alike in the two diverse settings. However, Pisutova (2016) revealed that participants do not anticipate participating in negotiations, but they didn't hesitated when they were told to do so.

3.3.2. Analyzing Interactions

Zheng, Yang and Huang (2012) proposed a new method named the" IIS-map-based method" for studying interactions in face to-face collaborative learning settings and reports that this method can analyze interactions effectively. Whereas, Anaya and Boticario (2011) studied two approaches that use "machine learning techniques" to analyze student group work. Fong (2012) analyzed the students' collaborative writing sessions by video-taping and they were followed by the production of student diary entries and interviews in order to understand the experience gained during the sessions. The findings show that all students had mutually benefited from the collaborative writing sessions.

Ahmad (2014) studied some existing Multi-agent based technologies and analyzed existing "Multi-agent based E-learning systems". Most of them are lacking in providing all features like intelligence, accessibility, interactivity, adaptability, collaborativity and security together into a one single system. Thus, the study proposed a new Multi-Agent based architecture called "BOKHARI-IMBLS" for E-learning situation with focus on mutual interaction and easiness of working on it.

3.3.3. Factors Affecting Performance

Premchaiswadi and Poroahan (2015) recognized the most significant factors that play role in affecting the performance of teams: (i) The degree of communication, interactions and involvement/participation between students has crucial impacts on the performance of groups. (ii) The extent of students' interaction, involvement and participation, and level of students' communication was four times greater in the high performance groups.

Fung (2007) found the most significant barriers in collaborative learning as: the lack of time and the learners' preference for spending time on reading than on online discussion. Thompson (2008) reported that "there was a strong relationship between the degree of online collaboration and the quality of group projects". Results suggested that team harmony, turning leadership roles, and self and peer assessment were valuable strategies to encourage collaboration.

Conclusion

The studies presented above gave us an insight to understand various collaborative

learning processes. To know actual success of collaborative learning we need to do quantitative analyses of the communications occur among the groups. The studies gave us several techniques to analyze the quality of interactions. Mobile applications have been also introduced to support collaborative learning.

3.4. Online Resources for Collaborative Learning

There are myriad of resources online that can be used for collaborative learning activities. In this section the studies are discussed that have exploited such resources for the good of educational processes.

3.4.1. Google Drive Environment for Collaboration (GDEC)

Marra et. al. (2016) created "a combined pedagogical and technological environment - Google Drive Environment for Collaboration (GDEC)" to maintain collaborative problem-solving. Regression analyses showed statistically significant relationships between: "Individual student contributions to the collaborative environment and homework and project and second exam scores; Pre- to post collaboration skill scores on all Dimensions of Teamwork scales increased."

3.4.2. Using Online Social Media

Pinto (2013) stated that using online social media on individuals, teams and organizations offers additional importance to both associates in the course of the growth of combined provision which is exclusive to that specific corporation and does a true input to the "intellectual capital" of each of the team mates. Levis (2011) demonstrated the use of social media in teaching-learning processes.

Liu (2016) made a Face-book Group, i.e., "Internship Community of Mobile Collaborative Learning" (ICMCL) to spot the viability of "mobile collaborative learning" for the prospective teachers. The results revealed that "the more frequency the pre-service teachers performed in browsing the Facebook Group, the more sense of community they had".

3.4.3. Using Wiki

Camacho et. al. (2016) described that the exercise of Wiki platform motivates students to study about collaborative activities and enhanced a "sense of community", rather than an individual accomplishment as in a "traditional competitive assessment". However, a few weaknesses are: (i) students not well conversed with new tool, (ii) Less understanding of "scientific texts" in English, this at times influence negatively the smooth progression of the work.

3.4.4. Using a Class Blog

Alvarez and Bassa (2013) used a "class blog" in an Argentinean university, in which "didactic strategies" to support group writing activities were applied. Results showed that the students were quite active not only in the "virtual space" but also help them to be more active in their regular classroom and enhanced their "fluency and precision in the conceptualization of writing".

3.4.5. ThinkLets

Chang et. al. (2016), introduced thinkLets to online collaborative learning. The results of the study revealed that "YST is proved applicable in this context, and satisfaction is higher in online collaborative learning with thinkLets".

3.4.6. Google Docs

Google Docs were used by Suwantarathip and Wichadee (2014) to see its effects on writing abilities of students. "Students in the Google Docs group gained higher mean scores than those working in groups in a face-to-face classroom".

3.4.7. Cloud Services

Cloud services have a feature that allows its user to edit the document and it can be further edited by multiple users with whom it is shared. The students chose the "multi-user mode" and when it is used in face-to-face CSCL, "(1) social influence plays a vital role related to students' intention to use; (2) training and problem-solving assistance are helpful to familiarize students" (Sui & Ming, 2016).

Conclusion

The above studies give us a variety of options to be used for our collaborative learning group. Google Drive Environment for Collaboration (GDEC), Google Docs, Cloud Services, thinkLets, class blog etc. Online social media, like wiki platform or Facebook Group motivates learners to gain knowledge about collaborative activities and develops a sense of community, instead of "an individual achievement as in a traditional competitive assessment".

4. Summary

Encapsulating, we can say that collaborative learning is very useful for all the stake holders. It carves and polishes higher order mental faculties of the subjects and serves the greater end of developing a sense of community, spirit of working together. Collaborative learning has a very positive effect on student learning and guides us towards the better and expert handling of such learning situations. Collaborative learning is a powerful tool to activate students' those cognitive faculties which are otherwise inactive. It develops the ability of problem solving and critical thinking among the participants.

Collaborative learning strategies need expertise. The concept must be understood and implemented properly. The teachers should be taught and should be motivated to use various collaborative strategies in their instructions. It is high time to realize the power of team work and put it into use. It is true that great changes need great effort and time. For inducing collaborative methods in teaching and learning with all the expertise required, the time is now.

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