Framework Guidelines for Students — Collaborative Learning in Distance Education

Sivachandran Chandrasekaran¹, Parminder Singh Badwal¹, Guy Littlefair¹, Manfred Mühlfelder²

(¹ School of Engineering, Deakin University, Geelong, Australia; ² SRH Mobile University, Riedlingen, Germany)

Abstract: This research study explores theoretical framework guidelines for students engaged in distance education through collaborative learning. Distance education has played an important role in the provision of educational equity for distance learners who live in remote Australian communities. Engaging students and academic staff will always enhance student-learning outcomes to ensure a positive experience in distance education. It can be effectively achieved through collaborative learning for off-campus learners. In distance education, academic staff and students encounter a number of challenges such as lack of student motivation, high student attrition rates, and a sense of isolation from a university community. Collaborative learning experiences will enhance learner-staff and learner-learner interactions in distance learning, which can be achieved through developing a learning process. The learning process for distance learners involves student-learning strategy, staff interactive sessions, peer-to-peer support, e-assessment, and self-realization of graduate learning outcomes. This distance learning process and framework guidelines are confined for Deakin University learning environment, however, the expectations is that the distance learning will be more mainstream in future of learning and teaching in Australian institutions. The focus of this research is to develop framework guidelines by analyzing collaborative learning experience of distance learners (off-campus) in a particular unit. It helps to analyze the barriers in distance education and finding ways to initiate collaborative programs in future. It also helps to fulfill the distance learners’ expectations on program delivery.

Key words: framework guidelines, student learning experience, distance education, collaborative learning.

1. Introduction

Collaborative learning has been gaining the interest of teachers since the 1970’s (Bruffee, 1984; Gaillet, 1994). In early 1980’s, it was the first time when the term collaborative learning appeared in the list of topics suggested by Executive Committee of the conference on college composition and communication (ECCC) for discussion at ECCC annual convention (Bruffee, 1984). In the following year, the collaborative learning effectiveness made its place from ninth place (last year) to first place on the ECCC topic list (Bruffee, 1984). At the same time, some shreds of evidences from previous literature started believing that this technique helps in
engaging students more deeply with text and also in academics engagement with professional communities (Bruffee, 1984). In Collaborative learning, students have the opportunity to interact and communicate with other peer learners to demonstrate their understanding of solving design problems. There are different ways to assess students learning capabilities, which are aligned to the learning outcomes. Collaborative learning is an educational approach to teaching that involves groups of learners working together to solve a problem (Laal & Laal, 2012). Collaborative learning is reforming the classroom learning. It enables the passive recipients of information (to whom education is provided by an expert teacher) to become active learners. The focus of this study is to develop framework guidelines for distance learners by analysing collaborative learning experience of distance learners (off-campus) in a particular undergraduate unit “project management”. This study helps to analyse the barriers in distance education and finding ways to initiate collaborative programs in future.

2. Significance of Collaborative Learning

Collaborative learning is beneficial only if there are well–functioning and active members in a group. The dysfunctional group activity can devalue the benefits of collaborative learning along with overall learning (Soller, 2001). Therefore, the mutual understanding within the group is vital aspect, which is considered as the major challenge to collaborative learning process. In order to achieve an effective collaborative learning, the process of teaching must include development and enhancement of student’s ability to learn (Gokhale, 1995). In other words, role of traditional teacher must be changed from just information transmitter to learning facilitator (Gamson, 1994). Achieving this change in role of traditional teachers is another challenge to collaborative learning. The importance of collaborative learning was depicted from the following aspects such as:

- Collaborative learning provides students with the skills of working in private/public workplace (Beckman 1990, O'Neill, Scott et al., 2011).
- Collaborative learning gives students an opportunity to share their individual experience and trading of ideas within the group. As a result of which students learn more with this learning technique (Raudsepp, 1984).
- Students learn importance of team work through collaborative learning (Beckman, 1990).
- Collaborative learning develop social skills in students which are not very easy to learn from lecture-oriented classrooms (Soller, 2001).
- Collaborative learning makes teaching and learning a shared experience (Resta & Laferrière, 2007).
- In collaborative learning, students take responsibility of learning (Resta and Laferrière, 2007).
- Collaborative learning enhances critical thinking and problem solving skills (Gokhale, 1995).

3. Impact of Collaborative Learning in Distance Education

The Advancement of networking technology (distance education) has benefitted universities to reach out the students having schedule or location constraints (Soller, 2001). This technology enabled the students to take advantage of many educational opportunities which were previously unattainable (Soller, 2001). In order to facilitate this networking technology, software was needed to support the structured on line learning activities. In early 19th century, computer supported collaborative learning (CSCL) system has been developed to support distance education (Guzdial, Hmelo et al., 1997; Jermann & Dillenbourg, 1999; Singley, Fairweather et al., 1999). The CSCL system initiated the provision of shared online workspaces, online lecture notes, online presentation and the most important tool for online communication, i.e., chat tools and bulletin boards. The online
communication tools along with other online tools enabled the students to participate in online discussion and provide directions or guidance to their peers (Bruckman & De Bonte, 1997; O'Day, Bobrow et al., 1998). The overall higher education system has promoted and enabled collaborative learning in distance education.

Garrison et al found that computer-mediated communication (CMC) system had the potential to change the nature of distance education by blending the features of collaborative learning with online/distance learning (Garrison, 1993). Kaye et al believed that computer mediated communication to bring a new paradigm in distance education (Harasim, 1990). In year 1999, Elizabeth Stacey conducted a study aimed to observe the effects of computer-mediated communication on online collaborative learning. Stacey observed that CMC maintained environment for social construction of knowledge by empowering collaborative learning process (Stacey, 2007).

In addition to the above systems, in 2007 wiki (another computational system) was launched to facilitate collaborative learning in distance education. This system enabled all the off-campus students to interact with each other via taking part in online discussions and sharing their experiences with each other (Lamb & Johnson, 2007, Jones, 2010; Chawner & Lewis, 2013). The wiki process was meant to facilitate online collaborative learning. Peter in his research study found that wiki offered a mechanism for promoting collaboration among online students and benefited the off-campus students by enabling them working collaboratively (Jones, 2010). Deng et al., and Elgort have found that web 2.0 application, blogs, podcasts along with social networking or internet based activities which promotes online collaborative learning has brought a dramatic revolution in the higher education system (Deng & Yuen, 2007; Elgort, 2007).

The above literatures reveal that just after implementation of collaborative learning over the traditional lecturing system, the efficiency (in terms of effective learning) of collaborative learning encouraged the education providers to introduce collaborative learning in distance/online education as well. For the same reason various computational systems were developed. Thus each computational system (e.g., CMC, CSCL, wiki etc.) was proved to be very efficient in spreading collaborative learning trend in online learning system. From the overall discussion, collaborative learning technique was proved to be the most efficient technique of delivering education in distance education system.

4. Methodology

The online survey questions were designed to determine the students’ level of experience on collaborative learning from undergraduate engineering. The views of students on collaborative learning in a particularly from third year engineering unit called “Project Management”. From the quantitative and qualitative analysis performed, the results are analysed and presented from a students’ perspectives. The survey is paper based which was conducted by a third person not involved in the teaching. The survey was given to 35 students in the third year of engineering class, which was anonymous and non-identifiable. These results are from students’ own experiences and the results present various views, which include students’ knowledge and expectations in collaborative learning. The survey questions used in this research were given in Appendix A. The third year unit “Project Management” was a core subject where students need to undertake after passing the professional practice subject as a prerequisite. The scope of this unit focuses on engineering project management, which teaches knowledge skills and competencies relevant and commonly required to proficiently manage projects that typically involve or are encountered in professional engineering practice. It also concentrates on three main concepts such as preparation and planning required for a project; the activities associated with managing the project including
resource management and human management; and the evaluation of project status and completion of a project.

5. Student Views on Collaborative Learning

In order to have a better understanding of collaborative learning technique at undergraduate level, it was essential to conduct a research on the impact and comfortability of the students in using the existing system of collaborative learning techniques. A total number of 35 students where requested to answer a questionnaire with 9 distinct questions which were put forth to collect the data at the end of the semester. Out of which, 18 completed the initial survey and this explorative research aimed at discovering the perception of students about the comfort level, the impact of using cloud based technologies/activities, and personal preferences of working in a team and about factors affecting the engagement of off-campus learning.

![Figure 1  Impact of Learning Resources](image)

When students where asked about the resources that had major impact on their learning outcomes during their learning process. From the responses obtained it is clear that 33% of the students mentioned using recorded class lectures and 27% of the students mentioned on blackboard collaborate (E-live sessions), about by 22% of the students mentioned on online learning resources. Whereas 18% of the students are in a mixed mode of using discussion forums and interacting with other students online (11% and 7% each), as shown in Figure 1. It is worth to notice that most of the students preferred recorded lectures and collaborating black board sessions.

The students are also asked about their perceptions on collaborative learning. Table 1 shows the responses that indicate that majority of students described that collaborative learning is an interactive approach to teamwork (67%) and the active involvement in explorative learning (33%). Table 1 also clearly depicts that the aspects of learning in team and peer-to-peer learning where not preferred by the students. The past literatures prove that the positive impact of this collaborative work enhances the fact of learning in groups and to perceive the usefulness of the explorative learning with peer support.

<table>
<thead>
<tr>
<th>Perceptions</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interactive approach to teamwork</td>
<td>67</td>
</tr>
<tr>
<td>Learning in teams</td>
<td>0</td>
</tr>
<tr>
<td>Active, involved, exploratory learning</td>
<td>33</td>
</tr>
<tr>
<td>Peer to peer learning</td>
<td>0</td>
</tr>
</tbody>
</table>

When students are asked about the comfortability of collaborative learning, it is clearly shown in Table 2 that

943
around 67% of the students revealed that collaborative learning does help in distance learning and 33% of students revealed that it is necessary for distance learning. From this cohort of students’ perceptions from third year undergraduate engineering, it is evidently shows that students interest in learning teamwork skills and are becoming ready for future career.

<table>
<thead>
<tr>
<th>Students Perceptions</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is necessary</td>
<td>33</td>
</tr>
<tr>
<td>Does helps</td>
<td>67</td>
</tr>
<tr>
<td>Possible helps</td>
<td>0</td>
</tr>
<tr>
<td>Is not necessary</td>
<td>0</td>
</tr>
</tbody>
</table>

Figure 2 shows Student’s perceptions on their experience with the cloud based technologies/activities in Distance education. It is clearly shows that the use of and usefulness of blackboard collaborator for inter and intra team communication in cloud based technologies/activities in distance education has an equal value in being efficient, very efficient and somewhat efficient with an aggregate of 33%. On the other hand, sufficient interactivity with staff/students, Ease of use and quality of access has their distribution in being effective (67%) and very effective (33%). It is evident from the observations that the students’ perception on the various scales of measuring collaborative learning technique proves to be efficient.

Figure 3 clearly depicts that it is really important to understand the effect of collaborative learning with the ability of the student to achieve their graduate learning outcomes. Based on the perceptions of students on how collaborative learning affects ability to achieve GLO, it is clearly shows that the positive impact on the interactions with information and communication technologies and the easiness of working more effectively on project/assignment tasks is very much useful (11%) and 33% of students say that it is somewhat useful. Followed by the encouragement to spend more study time off campus having an equally distributed opinion of 33% deciding that it is very much useful, 11% of students say for somewhat useful. The approach of individual learning
which enhanced the freedom of learning at students pace, around 22% of students revealed that it is very much useful and 44% of students reveals that it impact is less (11%–little and 33%–somewhat). Also, very few students’ judges that the impact of interacting with other students helped in achieving the learning outcomes. Around 22% of students mentioned that interacting with other students is not really positive. One of the Deakin graduate learning outcomes (GLO7) is teamwork skill, the collaborative learning in teamwork will enhances problem solving, analytical thinking, communication, working through difference of opinions, negotiating issues and perspectives in a team.

Figure 3  Collaborative Learning Affects Students Ability to Achieve Graduate Learning Outcomes

Figure 4  Factors Affecting Students Engagement in Off-campus Learning

Figure 4 shows that Time management was a dominating factor affecting the engagements of the distance learners. Most of the students (22%–44%) agree that the influence of other factors such as Family, social and professional commitments, learning teaching resources, timely feedback and response to queries are affecting the engagement of off-campus learners. Some of the students (11%) are aware of managing work, family and study in a balanced way. When students are questioned about their preference in assessments, about 67% of the students preferred to have 80% individual and 20% group assessments (Table 3). Table 4 shows that 100% of students
preferred to be in a group of 3 persons when the students are asked about the grouping.

Table 3  Students Perceptions on Assessments

<table>
<thead>
<tr>
<th>Students Perceptions</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>0% group (peer assessment)/100% individual</td>
<td>0</td>
</tr>
<tr>
<td>20% group (peer assessment)/80% individual</td>
<td>67</td>
</tr>
<tr>
<td>50% group (peer assessment)/50% individual</td>
<td>33</td>
</tr>
<tr>
<td>80% group (peer assessment)/20% individual</td>
<td>0</td>
</tr>
<tr>
<td>100% group (peer assessment)/0% individual</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 4  Students Perceptions on Grouping

<table>
<thead>
<tr>
<th>Students Perceptions</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (individual only)</td>
<td>0</td>
</tr>
<tr>
<td>3 students in a group</td>
<td>100</td>
</tr>
<tr>
<td>5 students in a group</td>
<td>0</td>
</tr>
<tr>
<td>Group randomly</td>
<td>0</td>
</tr>
<tr>
<td>Group by student own preference</td>
<td>0</td>
</tr>
</tbody>
</table>

![Figure 5  Students Perceptions on Grouping](image)

Given the fact that the collaborative learning technique involves a lot of group assessments, it is important to know the experience of students with respect to on/off campus students in a team. It is clearly shown in Figure 5 that the preferences of the students are towards having a mixed team with both on and off campus students as in Figure 5. About 33% of students prefers 1–2 on campus in an off campus group where as 67% of students prefers 1-2 off campus students in an on campus group. Overall students’ perceptions reveal that both on-campus and off-campus students experienced and revealed that collaborative learning is essential for life-long learning and problem solving which develops shared understanding between the team.

From the overall analysed survey results, students reveal the use of online recorded lectures followed by the blackboard sessions (online collaborative session) are more supportive in learning resources. The blackboard session is an online classroom environment, which enables students and teachers to communicate synchronously with audio, video, text messaging, and a white board with file/screen sharing. Majority of students describes collaborative learning is an interactive approach to teamwork and the active involvement in explorative learning. Around 100% of the students revealed that collaborative learning does help and is necessary for distance learning. It is also evident that students have very efficient experience with the cloud-based technologies/activities used in distance education. Figure 3 shows the positive impact on the interactions with information and communication
technologies and the easiness of working more effectively on project/assignment tasks. It clearly depicts the experiences of students on collaborative learning which helps to enhance their ability to achieve graduate learning outcomes such as teamwork, communication, critical thinking, problem solving. Most of the students revealed that the time management is a biggest affecting factor with family, social and professional commitments during their studies. The students want to be assessed more on their individual effort and less on their team work which resembles the students comfort of undertaking the responsibility of submitting work for assessments. The collaborative learning is a positive approach for all students in a classroom where on/off campus work together with other team members and enhance their learning capabilities.

6. Framework Guidelines for Students

The framework guidelines were designed and derived from the student perceptions through survey results. From the set of survey questions asked around collaborative learning, the below framework guidelines are appropriate for the cohort of students studying at Deakin study environment. Figure 6 shows framework guidelines for collaborative learning for students.

![Figure 6  Framework Guidelines for Students](image)

The guidelines are for both online and on-campus students to work as a team effectively and efficiently in a collaborative environment. Self-management, peer to peer support and technology integrated learning are three important aspects that a student need to considered in a collaborative environment.

6.1 Self-management

Educational institutions have the responsibility of educating students in their engineering disciplines through different modes of delivery. The students have their responsibility for acquiring quality learning by managing professional/personal activities. Through a chosen learning career path, students obtain a great opportunity to gain self-managed, self-directed learning strategies that helps to attain full potential in an academic environment. From the survey analyzed, it is clear that students need to follow a self-managed strategy to work effectively in a team.
of members who are combination of on-campus/off-campus. This strategy also helps them to communicate and respond with the lecturer/facilitator from time to time. The following are the role/responsibilities of a student for a self-management. Figure 7 shows a triangle approach on self-management.

- Ability to observe and react in a professional environment (self-directed).
- Identify and solve problems in timely manner and give feedback to peer members.
- Seek support and guidance from staff member.
- Manage an adequate balance between family, social and professional commitments.

6.2 Peer to Peer Support

Peer to peer support is a well-established practice in many learning environments. In educational institutions, the aim of peer to peer support learning is to enhance collaborative work in a team effectively. In peer to peer support, students obtain an opportunity to share their professional problems faced in team projects, assignments, assessment and content delivery. The mutual support and understanding will help to eradicate the problems and develop more intellectual and social skills within the on-campus or virtual learning environment. Figure 8 shows a combination of different role of a peer to peer support. The benefits of peer-peer support learning for individual student are

a) Improving professional relationships with colleagues/other peers in a team.

b) Developing teaching and learning practices from peer feedback.

c) Sharing broader knowledge of curriculum and implementing new learning ideas — being interactive and an effective learner.

d) Enhancing peer to peer assessment and learning outcomes — an individual and team assessor.
6.3 Technology Integrated Learning

At Deakin University, the learning and teaching delivery is a combination of cloud and located learning activities. Cloud learning (online learning) enables students to evidence their achievement in distance learning. The units contain integrated short, accessible, highly visual, media-rich, interactive learning experiences rebuilt for the mobile screen, and integrating learning resources created by Deakin to provide worldly and premium experiences for learners (Catford, 2012). In cloud learning, students have an opportunity to become generators of content, collaborators in solving real world problems, and are able to evidence their achievements in professional and personal digital portfolios. The technology-oriented experiences for the students take place in a digital environment where students are able to connect with peer learners, teaching staff, and mentors; and have the ability to create evidence of their achievements in the curriculum. The students learn the importance of teamwork through collaborative learning. The distance learners are away from each other and away from classroom environment. Technology is used as a stream to connect those students, which creates an online collaborative environment such as Cloud Deakin (virtual learning environment). Figure 9 shows how a student can be engaged with technology integrated learning.

The above guidelines assist students to be self-managed, peer supportive and technology enhanced learners. Time management is an ability to utilize the time more efficiently in order to enhance the productivity. Following this research study outcomes, there are literature discuss similar issues in practicing distance learning. Ranjita et al observed that poor time management may exaggerate the stress level among the students Misra and McKea (2000). Moreover, Macan et al., observed enhanced performance and work/life satisfaction among the students with better time management skills (Macan, Shahani et al., 1990). Similarly, till last decade peer feedback was believed to be having a resistance in peer assessment using grades (Cheng & Warren, 1997). Liu et al states that students can learn more from peer feedback assessment via meta-processes, i.e., reflection and justification of their work (Liu & Carless, 2006). The timely management and feedback helps student to enhance their learning capability and to develop various professional skills such as critical reflection, presentation skills and group coordination (Poulos & Mahony, 2008; Weaver, 2006; Topping, 1998). Hilary et al., found that the number of students drops from their studies due to a mixture of social and emotional factors (Gerdes & Mallinckrodt, 1994). To overcome this problem, students need to have an adequate balance between family, social, professional commitments and study which reduces the anxiety level and enhance their academic performance.

7. Conclusion

This research study explores theoretical framework guidelines for students by analysing students’ perceptions
on collaborative learning who engaged in distance education. From the analysed survey results, it is clearly highlighting that students learn differently in teams, the students also learn from the experiences of their peers. Collaborative learning gives an opportunity for assessing the team member’s strengths and weaknesses where students have peer-peer learning pressure makes the learning process active. This collaborative learning requires students to act in new ways, which is an excellent opportunity to work and share their knowledge with peers. This research study is an evidence for the academics to understand how collaborative learning works for students in different learning environments. Through collaborative learning, distance learners able to receive the same level of learning and teaching support, course resources, peer-peer interaction and staff interaction, assessment feedback by using Cloud Deakin as a feasible online learning environment. The above framework guidelines are more evident for students learning in virtual environment at Deakin study environment.

References
performance and stress”, *Journal of Educational Psychology*, Vol. 82, No. 4, p. 760.


