# Overview of Collaborative E-Learning

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*Abstract:* - Collaborative E-learning (CE) is very famous nowadays. CE integration can become a very challenging process that requires large technology resources. Although CE can bring competitive advantage and increase performances, the high failure rate is a major concern. The majority of previous studies and research projects have been conducted in identifying applications of CE. Hence, the purpose of this study is to explore the applications of CE that are used and the framework that applied for implement CE. The method used is this paper is by performing a systematic literature review based on search on four digital libraries. The tools, framework and advantages of application CE are identified from the review of the previous paper. The identified of tools and framework in application CE which are can help other researcher to prevent failures in the implementation of CE projects.

*Key-Words:* - Collaborative e-learning (CE); framework

## 1 Introduction

In recent years, e-Learning has become very famous. The information technology is integrated in curriculum which helps in creating much more effective learning environment than traditional learning and the system uses up-to-date and latest educational technologies to implement a learning environment. According to [32], the fundamental fact to the development of technology in education is growth rapidly and the technology are powerful for education, learning and teaching. Collaborative e-learning is a one of most powerful tools to disposal learning professional. [9]. Usually, students are working in groups of two or more, mutually searching for understanding, solutions, or meanings, or creating a product. Collaborative learning activities vary widely, but most center on students' exploration or application of the course material, not simply the teacher's presentation or explication of it. [10].

Hence, the purpose of this study is to explore the applications of CE that are used and the framework applied in the CE project implementation. Understanding these factors will deepen the perception of CE implementations and help to avoid mistakes during the implementation process, thereby increasing the rate of CE success. This study reviews the literature and identifies the tools of CE and the advantages associated with the CE implementation in the higher education. The framework is identified during and upon the implementation of the CE. The research was guided by three main research questions, which will be described in the fourth section:

1. What are the tools of application in Collaborative E-learning (CE)?

2.What are the advantages in implementing CE in the Institutions?

3. What is the framework will be apply for Collaborative e-learning?

## 2 Collaborative E-Learning

Eastern and Western scholar claimed that collaboration online learning where students learn together actively and interact with instructors and other participants via social interaction using a computer or online environments. [7], [8] and [26]. The activities of collaboration online learning through applications such as blogs, wikis, social networking sites, online games, online video sharing and immersive virtual environments. The term collaboration means working together and it is any active process that engages two or more partners work together to achieve outcomes that they cannot realize independently. After the introduction of ICT, collaboration can be defined as using the capability of ICT to facilitate the collaboration across organizations [9] Collaborative e-learning used in conjunction with peer and self-assessment can depend understanding, develop teamwork skills and draw attention to the process required for effective group work. [35] On the other hand "collaboration learning" refers to a method in that all learners at different levels of performance work with each

other in small groups toward a common goal. Participants share their understanding of subject learning with others and, support, cooperate with each other. They are involved with higher levels of emotional and cognitive skills in related and targeted process. [6]Collaborative learning is also to considered as a continuous process through which team members collectively or constructs a new knowledge. It also developed a group product through the experience of working together. [1]

# 3 Method

This study followed a formal systematic literature review process. As part of the process, a protocol is developed to provide a plan for the review in terms of the method to be followed.

## 3.1 Searching strategy

This section explains the strategy used to conduct the searches for this study. The strategy used to construct the searching process are by identifying the alternative spelling and synonyms for the terms and use the Boolean OR to incorporate alternative spelling and synonyms and used the Boolean AND to link the major terms.

### 3.1.1 Resources

The searching of the resources is conducted at a different digital library which is Science Direct, IEEE Xplore, Springer Link and Google Scholar. The total of the paper involved in this study are 50. The range of paper reviewed is from 2010 and above. The keywords used for searching are: Collaborative E-Learning, framework Collaborative e-learning, advantages collaborative e-learning and tools collaborative e-learning.

### 3.1.2 Additional Search Criteria
The search strategy was primarily based on a search in a digital library. However, primary source were all checked for other relevant references.

## 3.2 Study procedure

The list of primary studies identified by the search is evaluated against the set of inclusion and exclusion criteria. The criteria used are as follows:

### 3.2.1 Inclusion Criteria
The study is to review about the collaborative e-learning and the framework design in implementing the CE in an higher education. Thus, in the process of the conducting this study, some inclusion criteria are applied:
a.      Publication, paper, and technical reports that study that describes about the tools and advantages collaborative e-learning and the framework design found in the implementation of CE.
b.      When several report of the same study exists, only the most completed publication will be included.

### 3.2.2 Exclusion Criteria

The studies that met the following criteria will be excluded from the review because we only want to focus on overview of Collaborative e-learning applications and framework:
a.      Publication/reports for which only have an abstract or Power Point Slide available.
b.      Unpublished report from internet source

The primary resources selection is reviewed based on the title, keywords and abstract. Then, those completed primary resources that found to be relevant for the study will be selected and the irrelevant resources will be excluded. Full copies of the primary resources will be reviewed based on the inclusion and exclusion criteria.

# 4 Result

## 4.1 Tools of Collaboration Online Learning

Basically, social network are the most part in collaborative e-learning tools. The collaboration tools and interacting tools help students and lecturer luxury in a formal and informal way of knowledge attainment. These tools recently have become an important part of today's educational system, including learning management systems (LMS), such as Moodle, Blackboard, Atutor, Fronter, and massive open online course (MOOC) eLearning platforms such as Coursera, edX, Udacity, Khan Academy. The social tools not only provide an easy way of communication between users to collaborate on numerous tasks, but they also are a good way to share knowledge by promoting distance. [75] Previous researcher mentioned that there are many tools for collaborative e-learning such as forum, using instructional technologies online tools ProofHub, MindMeister, Google Docs, BigMarker,

SlideRocket, and Skype. [8] and [10]. Another researchers addressed that several computational tools used by the Alpha–Beta Research Group when coupling collaborative and mobile. [71] There are many activities involved in collaborative e-learning such as Collaborative work on a group project (wiki), Playing a group game (serious game), Collaborative accumulation of information for shared use (database), Glossary which is the learners collaboratively create a dictionary of the terms, Assessment of one learner's work by other learner(s) (workshop), Chat, Videoconferencing, Forum and White board. These activities can be used in different combinations between them to ensure the interaction required for collaborative learning [3] and [6]

These online group collaboration tools have enabled smooth and fast communication, collaboration among distantly located students and their instructors. Consequently students can growth more from the experience of their lecturers. These tools along with instructional design and application strategies devised by instructors has managed to improvement of knowledge and polishing of students' skills. This has acceptable educational benefits to reach to more and more students universally beyond the boundaries of classrooms.

## 4.2. Advantages Of Collaboration Online Learning

Recently scholar mentioned that there are many advantages in collaboration online learning. Several benefits in collaborative activity participation in an online learning environment were found including the teamwork skills, increased responsibility attitude to collaborate and development of cognitive processes within the group.[19]

Students will more advanced and deep understanding of the subject, skills of processes, active role on learning and critical thinking. [7] In the other hand, collaboration online learning can increase participation and creativity level problem-solving skills, decision-making power, critical thinking, virtues and moral values and self-confidence. [6] Online technology collaboration learning more freedom in time and space. Students were highly confident and strongly motivated. [15] On the other hand, the benefits of collaboration online learning also improvement the generic competencies which are teamwork competencies, enhancing student's confidence, intercommunication abilities, boosting student's collaboration abilities and stimulating student's

innovation abilities. [1] and [20] Some of the previous researcher [3], [21], [70] and [5] claimed that the advantages of collaboration online learning which are classified in the following three categories.

i. Social Benefits
- students will creates a positives atmosphere, learning communities, encourages social, builds teamwork, social organizational, decision making, debating and presenting skills
ii. Psychological Benefits
-  It referred to increase a confident and satisfaction of the learner, creates positive attitude towards lecturer and studied subject, builds responsibility to learning and time management skills.
iii. Academic Benefits
-      Process learning by online are promotes critical and analytical thinking, active participation of students in the process of education, increase motivation, creates and environments of active participations, more effective problem solving, develops communication and technology skills

## 4.3. Research in Collaborative Learning

In collaborative e-learning, the evaluation process is most important to ensure that the activities of collaborative learning achieve the target and the objective. There are several researcher studied about many issues regarding the collaborative e-learning. For an example, studied indicate that focused an activity of group assignment task in virtual [68], studied the tools and platform that approach for performing collaborative e-learning, [66] ,[17], [13], [28], attitudes in interaction that occur in collaborative e-learning platform[66], student engagement satisfaction [11], [30], [65] experience and perception learner which using collaborative e-learning [22], [18], [14] , [67], [29], comparison of impact using collaborative e-learning [28]evaluated the performance while using collaborative e-learning [63], [64], [15] ,[16] Assessment of skills and knowledge is a crucial factor in systems supporting e-learning in general and personalized eLearning and social-collaborative e-learning in particular. The use of open-ended questions and questionnaires is deemed important in the area, while this is one of the assessing methods more work-intensive for the teacher. The evaluation process (Fig. 1) in the context of learning has a transversal nature and spread throughout. This process consists of two sub processes of peer assessment and self-assessment. [1]

Fig.1 The assessment process in project

Online peer learning and assessment in the collaborative learning process in higher education practice are examined with respect to the learners' experience and reactions to that experience. The assessment has underlined as a critical success factor of online education. Based on the theoretical framework of CHAT and the application of the Adobe Connect program, the study examines how learners in an online context can be collaborative and social with the support of this program. . Therefore, the study addresses the idea that peer learning and assessment are critical to encouragement the quality of the online learning and teaching process in the higher education system, and it attempts to show that the contributions to the field are practical applications of online education studies. Limitations of the collaborative learning environment may be investigated in detail, and higher education institutions may develop their own organizational and pedagogical models that improve practice and give insights on the value of these models and their limitations. [22]

### 4.4. Process of collaborative learning

Collaborative learning is a training technique in which several people gain skills by studying together. Actually, modeling language according to [24], there are Cooperative Problem Based Learning Meta Model, LDL- Learning Design Language and PoEML (Perspective Oriented EML). The main feature of a collaborative target involves in many players commit a suit of transactions in order to perform some common objectives. Each player shares its own knowledge or information (part of), documents, databases, different computer application and so on. Such partners will exchange data entities and knowledge reaching common and individual objectives. By deploying this approach, the implementation of new learning methods is needed. A new dimension – collaborative environment specific – has a large impact on the

learning process (methods and methodologies) because of the essential collaborative environment of learning. An entire face to face meeting is the appropriate way in communication. [72] Collaborative e-learning consists of seven dimensions which are cooperation, communication, psychological support, conflict management, work organization or planning, resource management and support for innovations. [1] Previous researcher also claimed that the five elements should be present, so that a group exercise can be called collaborative e-learning. There include positive interdependence, face to face promote interaction, individual and group accountability, Interpersonal and small group skills and group processing. [3]

### 4.5 The existing collaborative e-learning framework

This universal view has to also include the roles and varieties of participants (students, lecturers, tutors and designers) in the various stages of the collaborative process. The derived framework has incorporated all these elements. The framework is also a guide to both designers and developers through a laid down development process. The resulting output of the framework supports synchronous and asynchronous, intrapersonal and interpersonal, formal and informal teaching and learning and is an aid in the delivery of other information relevant to both learners and instructors. It is therefore our belief that when the derived framework is used in the development of e-collaboration system, it will lead to effective experiences. However in this studied have some limitations. [25] claimed that it has not yet been prototyped and empirically tested. The testing will be realized when an online collaborative teaching and learning environment has been developed as an online educational platform and its usability and effectiveness has been confirmed through series of evaluations.

Another researcher using Community of Inquiry (COI) Framework to investigate the interplay of computer supported collaborative learning tools, psychological factors, and learning behaviors, with the goal of increasing active interaction among learners. COI framework consists of three elements which included social presence is the ability of participants, cognitive presence and teaching presence which is refers to the design, facilitation and direction of cognition and social processes. [27]
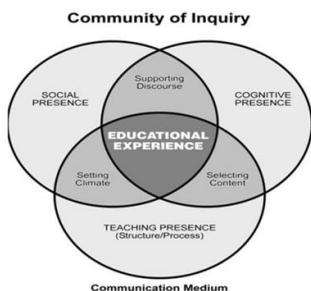
The CoI framework is a useful framework for evaluating learning activities and behaviors in the learning community however the limitations of using CoI framework just a few studies have referred to it in relation to effective CSCL design. The findings showed it can contribute to effective CSCL design and class design with the use of social media, such as Facebook. [27] Similarities previous researcher studied also applied CoI framework for the collaborative e-learning [28], [29] and [30]

Using ADIIE Model as the framework from the previous studied, several phases were involved in process of designing the diskusiMAYA platform including analysis phase, design phase, integration phase, implementation phase and evaluation phase. Through the diskusiMAYA platform, the log report for detailed information through field research that can record students' interaction and learning outcomes were used. Conceptual framework shown as fig.3 below.
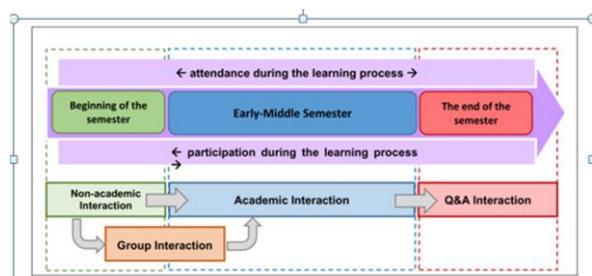


Fig.3 Conceptual Framework

Through Collaborative Taxonomy (Salmons, 2011), researchers found that first and second categories namely 'Reflection' and 'Dialogue' are the most generated interaction, while the most difficult interaction to be established in diskusiMAYA platform is interaction at stage 6 namely 'Synergized Collaboration'. 'Synergized Collaboration' requires the highest level of active participation from all competent group members using intermediary medium by regularly conducting critical discussion. Among the limitation that could be identified is due

to different job-related experience, difference of technical skills in gathering the course such as developing learning software and lack of reading, in which majority of the respondents are not active in attaching reading materials as reference in discussions. [73]

Framework of GroupStudy also one of framework in collaborative e-learning. With this online group study model students can create a group and share their ideas and they can work collaboratively as such in a physical group study which is more than a forum. Group Study as a method for improving the peer interaction in MOOCs. The framework is very well utilized by the students for interacting with the peers and the outputs of group with the highest rate of interaction is found to be best among the obtained outputs. [74]

Cultural Historical Activity Theory (CHAT) is the basis of the framework of the collaborative e-learning that mentioned by [22].The theory consists of the perspective that the online environment has also its own nature and culture. Learners need social interaction to share knowledge and skill development within this culture. Within the framework of CHAT, the Adobe Connect program enables facilitation to create a collaborative learning environment by which the online learning process adopts learning outcomes, rebuilding of knowledge and skills development for learners.

## 5  Discussion

Collaborative e-learning has become the trend that shows the evolution of science and technology. The issues addressed earlier are some of the examples of CE implementation. This issue is very important to the provider and also the users, for them to know the best's tools and framework design that they may use the in collaborative e-learning applications. This paper help focusing on the collaborative e-learning applications and the framework that it bring to the user. In addition, this study also addresses tools and advantages of CE application. Through this study, we identify that not many research is focusing on the evaluation in collaborative e-learning For future work, we would like to study more about the evaluation in CE and come up with a solution to overcome the problem.

## 6  Conclusion

In can be concluded that, collaborative e-learning mostly gives more benefit and advantages also

useful and it's applied in many areas such as higher education, organization and industry. In this study, the most areas of collaborative e-learning application are higher education area. For an example, studied indicate that focused an activity of group assignment task in virtual [68], studied the tools and platform that approach for performing collaborative e-learning, [66] ,[17], [69], [28], attitudes in interaction that occur in collaborative e-learning platform[66],student engagement satisfaction [11], [30], [65] experience and perception learner which using collaborative e-learning [22], [18], [14] , [67], [29], comparison of impact using collaborative e-learning [28]evaluated the performance while using collaborative e-learning [63] , [64] ,[15] ,[16]

Overall, it will conclude that collaborative e-learning are very good to apply for learning process which are there are many beneficial for students, lecturer and also for organization. Collaborative e-learning are applied mostly in higher education and industry. But the most area that previous researcher studied in area higher education which is focusing for the students and lecturer can observe and peer the assessment by online collaborative learning. Collaborative e-learning impact is classified in three categories which are advantages for social benefits, psychological benefits and academic benefits. There are many framework will be applied in collaborative e-learning such as using Community of Inquiry (CoI), ADIIE Model, Conceptual framework, framework of GroupStudy and Cultural Historical Activity Theory (CHAT). However, the future researches its need to review deeply the criteria of evaluation that related with the topic or subject which are study for collaborative e-learning.

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