CHAPTER 1 THE PROBLEM

In this chapter the rationale of the thesis, theoretical framework, statement of the problem, assumptions, scope and delimitation, and importance of the study are discussed.

1.1 Rationale

Learning process in higher education compels each student to actively play a part in every learning activity. To support this, many universities, especially in the United States and Europe start to offer learning community (LC) that plays important role in "mediating the relationship between learning community participation and learning outcomes" [72]. LC consisting of a group of students and faculty emphasize learning group in the process of knowledge construction of group participants or commonly called as constructivism [17]. Besides, LC also use the concept of collaborative learning [25] which involves joint intellectual effort by students, or students and faculty together [76].

However, different from the situation in Indonesia, LC is still not known at universities in Indonesia. Likewise with Telkom Graduate Engineering School (TGES), a faculty that runs master study program in engineering at Telkom University. As a college of engineering that focuses on the development of information and communication technology, TGES need to develop learning students develop creativity, but to remain focused on the development of information and communication technology. This is consistent with the results of research conducted by UNESCO (2010) in Zhou stating that creativity is a skill that is required by the engineering students for the challenges of the global era in the future [99]. It is also supported by the Law of the Republic of Indonesia education system in 2003 which also states that the education that develops the creativity of learners becoming the standard of education in Indonesia [36].

Therefore, this thesis proposes a conceptual model that incorporates the concept of creative thinking in the learning community supported by information and communication technology.

1.2 Theoretical Framework

In this subchapter a brief review of literature of the concepts or knowledge bases underlying the rationale of this study is presented. Exposure of these concepts is expected to provide an understanding of creative learning community in universities in Indonesia. Map of the concepts that support this research can be seen in Figure 1-1.
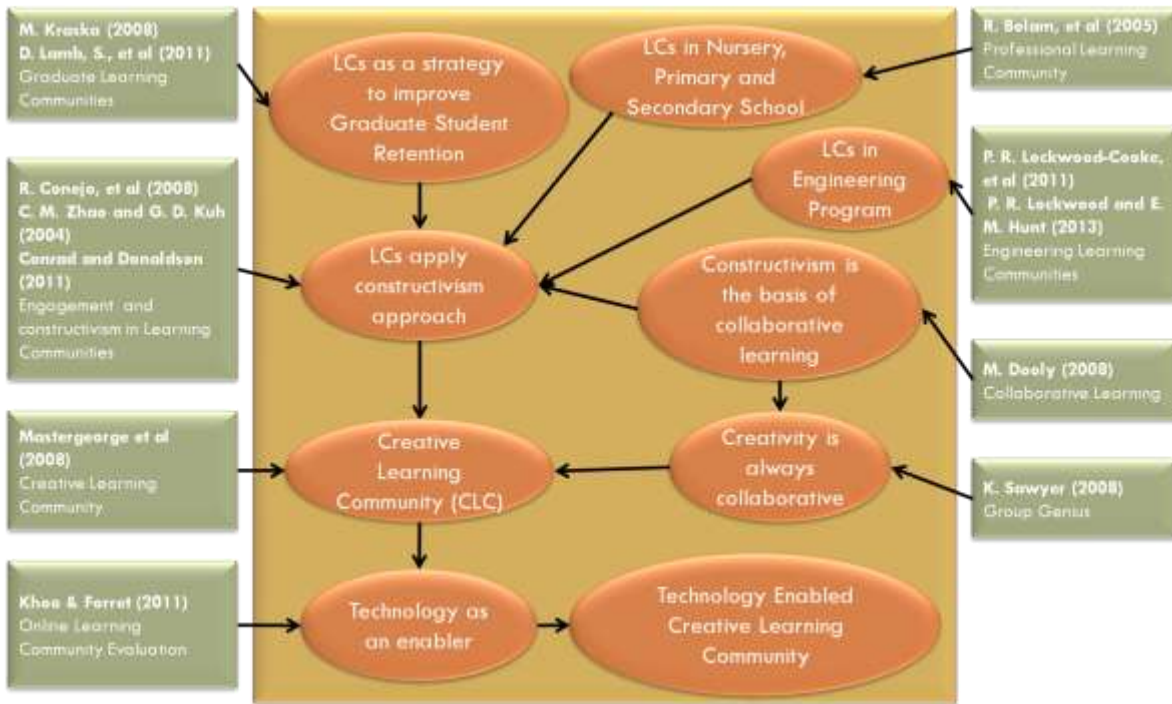
Figure 1-1 State of the art of the thesis

Learning communities have been studied since more than two last decades [**49**], study about the implementation of learning communities to improve undergraduate education is one of the topic which are explored [**72**]. Besides, student participation in a learning community has positive link to student engagement, outcomes and satisfaction with college are findings in another research of learning communities [**97**]. As Conejo et al. revealed that learning communities is endorsing the constructivism learning approach [**17**], it is a paradigm that knowledge is constructed and transformed by students [**25**]. So, we can say that learning community is a learning strategy that boosts learner to build their own knowledge in such a group situation. This underlies several studies examining the correlation between students' engagement and the success achieved when they are involved in a learning community [**97,17**]. The impact of development of mobile and wireless technologies, mobile learning community term begins to be explored as a new topic research in learning communities [**59**]. It begins with the development of a new paradigm in electronic learning pedagogical design known as mobile learning [**50,58**], ubiquitous e-learning [**74,48,55**], or just-in-time mobile learning [**89**]. The development of information and communication technology leads the education system to use computer, network or other technology devices as the learning tools in learning communities both in virtual [**17,18,45,34**] or in actual environments [**7**].

In addition, school level also uses the concept of learning community which is called as *professional learning community* (PLC) [**30,70,91**]. Literature revealed that this concept has been concerned about over twenty-five years ago. It is used as *"a strategy to increase students' achievement by creating a collaborative school culture focused on learning"* [**30**].

In Indonesia, there is also a PLC-like which is called as *community college* (*Perguruan Tinggi Komunitas*), what makes it different with PLC is that the program is a continuation of senior high schools or called as the *post-secondary education.* The program is proposed in order to build the

national economy through the strengthening of regional economic. It is a higher education in the area (county and city) for 1-2 years' duration with a focus on applied education. It is designed for wider community either who has been working and/or not yet, low-income workers, and the general public who require local technical skills (life skills) so that they are able to work and/or improve the quality of jobs that have been practiced [**79**].

The work of Zhou [**100**] encouraged the development of creative skills in engineering program within group situation, particularly through problem and project-base learning approach. Because creativity is vital characteristic that is needed to create innovation in engineering programs, Psychology and Engineering Program of Ohio University developed *Creative Engineering Design Assessment* (CEDA) [**13**] [**14**]. Creative personality, cognitive risk tolerance, and engineering creativity are the CEDA scores that characterize the students between genders (men and women).

Study about group creativity which popularized by Goran Ekval in 1983 emerged many researchers to examine the creative climate within a group or organization, Creative Climate Quotionnaire (CCQ) was a tool he developed "to assess how much any particular context will support creativity and change" for organizational diagnosis and development [**38**]. Decades before, the studies about creative thinking emerged. Bacanlı et al, describe creative thinking with quadruple thinking which consist of *"critical thinking, creative thinking, caring thinking and hopeful thinking ways".* They added three Mathew Lipman's teaching thinking which consist of "*critical thinking, creative thinking, and caring thinking"* with *"hopeful thinking"* as *"in consideration of the needs of Turkish society"* [**5**]. They divided teaching thinking ways into two dimensions through with "cognitive-affective and convergent-divergent" [**5**]. Edward de Bono as one of the central figures in this area, then originated the lateral thinking term [**98**]. Lateral thinking is regarding with insight, creativity, and humor [**10**].

The use of technology in supporting learning process is widely known as technology-supported collaborative learning [**71**]. It is acknowledged that the use of technology in supporting learning process is designed by colleges or universities has some motives; as revealed by Resta and Laferrière the motives why colleges or universities provide learning process with supporting technology is *"to prepare students for the knowledge society, to enhance student cognitive performance or foster deep understanding, to add flexibility of time and space for cooperative/collaborative learning, to foster student engagement and keep track of student cooperative/collaborative work (online written discourse)"* [**71**]. Collaborative learning is a concept that *"emphasizes providing a shared workplace for students to interact and learn through cooperation"* [**51**]. It focuses on *"students' exploration or application of the course material, not simply the teacher's presentation or explanation of it"* [**76**].

A framework for collaborative systems assessment has been studied by Cugini et al [**21**] . It describes the "collaborative capabilities, that is: human communication, persistent shared object manipulation, archival of collaborative activity and so forth" [**65**]. "The main quality characteristics of the collaborative systems" as cited by [**65**] in [**23**] namely: "correctness, flexibility, interoperability, maintainability, reliability, testability, and consistency". Damianos, et al proposed Evaluation Working Group (EWG) Framework for Collaborative Systems "to facilitate description of a collaborative system and to evaluate how well that system supports various kinds of collaborative work" [**23**]. It has four levels: requirement, capability, service, and technology. There is also a

model to measure information system success which is known as DeLone and McLean (D&M) model using the six dimensions: *system quality, information quality, service quality, use, user satisfaction, and net benefits* [**64**]*.*

1.3   Statement of the Problem

1. What are the learning community characteristics of the Graduate School of Telkom Institute of Technology? How are they structured? What activities do the learning communities engage in?
2. What course that is representative to enable creative learning in the Graduate School of Telkom Institute of Technology?
3. How to collaborate learning among the learning community members within Graduate School of IT Telkom learning process? What is known about technology use to facilitate the work of learning community for faculty?

1.4   Scope and Delimitation

Scope and delimitations of this study are:

1. The context of the model is in Telkom Graduate Engineering School, Telkom University
2. The study produces a conceptual model of technology-enabled creative learning community located in Telkom Graduate Engineering School, Telkom University the findings are not evaluated yet in the other universities.

1.5   Importance of the Study

Two main contributions of the study are:

1. Conceptual model of *technology-enbaled creative learning community* to the knowledge base especially in area of Engineering Education
2. Guidance of the application of *technology-enabled creative learning community* for thesis course at Telkom Engineering Graduate School, Telkom University. The study provides rationale and development guidance that can be used as consideration in developing learning process of thesis course by the study program.

1.6   Definition of Terms

Terms used in this thesis are as follows:

CLC   : Creative Learning Community

LC   : Learning Community

T-E CLC : Technology-Enabled Creative Learning Community

TEGS   : Telkom Engineering Graduate School

Tel-U   : Telkom University