CHAPTER 1
INTRODUCTION

This chapter introduces the study of computer supported systems for reflective learning. In this chapter a background of the area followed by the problem statement, research questions, purpose of study, limitations, methodology, and the definition of operational terms are presented.

1.1 Research Background

The widespread use of technology in education throughout the world is known to all involved in education. The author believe that the pioneering development of Communications and Information Technology (C&IT) holds out much promise for improving the quality, flexibility and effectiveness of higher education. The potential benefits will extend to, and affect the practice of, learning and teaching and research. Learning performance assessment aims to evaluate what learners learnt during the learning process.

In recent years, how to perform the learning performance assessment is a critical issue in the web-based learning field. Still, lecture-based training is effective only for certain types of students (Gudivada et al., 2008). In the last decade or so, there has been powerful attention in using non-lecture based teaching methods and classroom activities to improve student learning (Bean, 2001 & Silberman, 1996). According to Gudivada et al. (2008), these methods include cooperative learning, collaborative learning, experiential learning, exploratory learning, peer-assisted learning, problem-based learning, reflective learning, writing based learning, and active learning - some of these methods can be used in lecture-based training too. Reflective learning (RL) refers to a
great or deeper degree of processing material to be learned. It engages a large amount of the learners thinking or cognitive capacities.

Various studies have shown that active and cooperative learning (ACL) increase student comfort with course materials, improve student confidence and learning skills, decrease drop-up rates, reduce gender and racial bias, retain non-traditional students, increase student motivation and increase higher order thinking (Miller & Groccia 1997; Sandler et al., 1996; Doughetry et al., 1995; Anderson & Adams 1992).

The other method used for non-lecture based teaching is reflective learning. In most academic background, students utilize critical thinking skills to discover complex thought at the core of their authority. When students take on in critical thinking, they are disposed to develop approaching the concepts and the learning process. Educationalists use different strategies to hunt the best technique to keep the student actively in their learning. Most of the educational institutes aim to lead in fundamental, modern changes in both course and teaching-learning process by integrating technology (Woo, 2003). Since the beginning of reflective learning in higher education, student depth of understanding has been increased (McConnell, 2005). These facts are growing interest in using reflective learning techniques.

1.1.1 Recent approaches

Finding signify that students may be classified, according to Kember et al. (1999), as non-reflectors (lack evidence of deliberate appraisal), reflectors (demonstrate insight through analysis, discrimination, and evaluation), and critical reflectors (indicate transformation from initial perspective).
Reflective learners consider in their motivation, attitudes and idea, skills they need for different components of their study and learning, and the gaps in their knowledge and skills (Thorpe, 2004).

There are a number of tools in literature intended for promoting reflective thinking and practice. One of them is creating learning journals. E-Reflective journals can reduce the impact of external control while providing opportunities to promote and document system instability and imbalance. Reflective journals allow for documentation of emergence, division and embrace participants’ involvement in interpretation of data in inherently non-linear ways. Reflective journals assist to build up a holistic picture of the interplay between an individual’s history and their current and emergent ‘state’, thus providing insight into ‘sensitivity to initial conditions’ (Phelps, 2005). Written reflective journals are both a learning and assessment tool and a medium for recording research data. It is important to notice that this strategy of reflective journals promote students to become active learners.

There are three knowledge management technologies which can be used to develop reflective learning:

- Concept mapping;
- Weblogs;
- E-portfolio.

With the concept mapping, learners develop reflective learning on the process of self-examination (Sheil & Jones, 2003). Learners reflect what they have learned and write the main idea in the center of the page. Concept maps are particularly useful for the process of giving birth to questions and analyzing the difficulties.
A blog was defined by Armstrong *et al.* (2004) as a web-based space for writing that does not require specialized technical knowledge and allows for frequent updating of content without recourse to individuals with technical expertise. Blogs (web logs) are one of the fastest growing features of the World Wide Web. They provide users with a personal web based space for writing, managed by the author who compiles lists of links to personally interesting material interspersed with information and editorial. Blogs lend themselves to a narrative and conversational structure (Armstrong *et al.*, 2004). These features differentiate them from more traditional online communication tools used in virtual classrooms and offer new possibilities for educators.

Learning portfolios are purposeful collections of artifacts that represent the learning experience of the portfolio owner who might be an individual or a group of individuals’ learners, project teams, and academic program (Wang *et al.*, 2007). The folio thinking approach is design to enhance self awareness by enabling learners to make their knowledge explicit and visible for themselves as well as for others, which helps learners not only with their self-examination, strategy giving but also with the evaluation. E-portfolio also deepens learning by enabling learners to make meaningful connections.

Multimedia communication technology can support reflective learning by distributed professionals, following their participation in group tasks. One of these technologies is voice annotations. It has been used by the participants to offer reflections upon the clips and these annotated clips are now being shared online among this community (Goodyear *et al.*, 2001).
Henry et al. (2001) found that, through collaborative action-based reflection, action learning can liberate participants from reutilized and habitual ways of thinking about themselves and their scope and capacity to act in and on their world. Action learning can be potentially self-transcendent and institutionally transforming. Much of the literature on action learning focuses on managers developing their capacity to learn and transform their own organizations.

1.2 Problem Statements

Nowadays, learning packages have various functions and ways to benefit the students. Besides giving notes and exercises, students may also see their achievements in group discussions. However, the reflective learning method requires every students participate actively in learning process. The reason that reflective learning comes in hand is that students can discuss their knowledge with each other. Furthermore, this study mostly emphasizes on reflective learning method to improve active learning. It was found that no concentration is given to the note modules. As mostly the notes are as the same and simple as what is printed in the text books.

In addition, implementation of online learning into educational system which guide to personalization is a significant change in this technology arena. According to Nelson (2008), one of the biggest challenges of any learning method is engaging the learner and the best way to do this is through personalization. Remarked by Nelson (2008), online learning is no exception - it is not simply about providing content; it is about providing a personalized learning solution - which is flexible, creative and relevant to the learner. Therefore, the enormous potential of online learning in the future of learning and development has to be taken into consideration.
Hence, the central focus of this study is identifying the design process and learning experience of the post graduate students at Faculty of Computer Science and Information Technology in University of Malaya through evaluation of the system according to reflective learning. In this dissertation, the post graduate students’ ability in learning as the result of implementation of reflective learning techniques in pedagogical model is studied.

1.3 Purpose of Study

The study aims to investigate reflective learning methods for post graduate students in University of Malaya. The students in this study are used to apply the various tools for reflective learning in their previous academic experiences. In respect to the learning outcomes of the method, this study aims to evaluate expression by the post graduate students to ensure the effectiveness of pedagogical approaches applied for this method and to learn about the learning experience of the students throughout the method while accomplishing the assignment.

In this dissertation, the events of the method and the design process of reflective learning are discussed. The research intends to evaluate the reflective learning method, designed for post graduate students, with a prospect of instructional design aspect, in addition to learn ability and usability of the products based on a rubric adapted by the author. This research work intended to disclose certain criteria which are required but have been ignored in order to help select and design suitable reflection activities for the post graduate students, owing to the fact that so far this vital task has been neglected in many higher education institutes.
1.4 Research Objectives

This research project is planned and carried out to address the following objectives

- To investigate an awareness of reflective learning among postgraduate students in University Malaya (UM);
- To utilize web based technology to facilitate reflective learning
- To design a suitable reflective learning method that suits the programs of study in Computer Science and Information Technology.

1.5 Research Questions

The task of evaluating a learning methodology experience with some degree of reliability and validity presents unique set of challenges. A look at the past and current methods of evaluation shows that practices are behind the times, often unreliable, biased by commercial interests, and rarely verified by independent studies (Buckleitner, 1999).

To achieve the objectives of a learning methodology for the purpose of successful instruction, (Plass, 1998), a variety of instructional activities are implemented that are supported by various tools and features of the program. Circumscribed by this conceptual framework, the study attempted to evaluate the feedback for a number of higher education learners in reflective learning. The questions that framed this research are as follows:

1. What was the experience of the higher education learners in the using reflective learning technologies?
2. Do the reflective learning technologies meet the criteria of a good design in the areas of instructional content, instructional design and usability?
1.6 Limitations

The study is restricted to the Reflective learning technologies provided for postgraduate students in University of Malaya. Thus, the group under study was assumed not to know anything about reflective Learning (RL) which made the researcher to spend extra time for some preliminary training.

While the literature supports the inclusion of reflective activities in education programs, it also cautions that these activities may not necessarily lead to deep reflection. An examination of reflective journals from an Australian teacher education program that encouraged reflective practices, found that many written reports were far from reflection and indeed merely diary entries describing an event or activity (Woodward, 1998). Similarly, Daugherty et al. (1995) undertook an analysis of written work of pre-service teachers and found instances of critical reflection in only a few students’ teachers in their final year. These experiences were also observed in this study.

1.7 Significance of the Research

The importance of reflecting on what you are doing, as part of the learning process, has been emphasized by many researchers. Reflective Observation (RO) is the second stage (in the usual representation) of the Lewin/Kolb learning cycle (Figure 1.1).
Reflection can help students to:

- Better understand their strengths and weaknesses
- Identify and question their underlying values and beliefs
- Acknowledge and challenge possible assumptions on which they base their ideas, feelings and actions
- Recognize areas of potential bias or discrimination
- Acknowledge their fears, and
- Identify possible inadequacies or areas for improvement.

Reflection can lead to a greater self-awareness, which in turn is the first step to positive change. It is a necessary stage in identifying areas for improvement and growth in both personal and professional contexts. Taking time to reflect can help students identify approaches that have worked well, and in that way reinforce better practice.
Schön (1983) suggested that the capacity to reflect on action so as to engage in a process of continuous learning was one of the defining characteristics of professional practice. It was also argued that the model of professional training which was termed "Technical Rationality" has never been a particularly good description of how professionals "think in action", and is quite inappropriate to practice in a fast-changing world. Technical Rationality is about charging students up with knowledge in training schools so that they could discharge when they entered the world of practice, perhaps more aptly termed a "battery" model.

Reflective practice is becoming increasingly popular in higher education courses, particularly in programs leading to professional qualifications. Stewart & Richardson (2000) suggested that the learning outcome to be desired from every student in higher education is that of a reflective practitioner, equipped with skills of lifelong learning. The outcomes of reflective practice for professionals are considered to be the ability to critique their practice, identify their own learning needs and take responsibility for continuing their professional education (Griffin, 2003; Stewart & Richardson 2000; Clarke et al., 1996). Reflective practice is also often put forward as a strategy that helps remediate the theory-practice debate, although it appears that there is no evidence to indicate whether reflective practitioners are more effective than their non-reflective colleagues (Stewart & Richardson, 2000). This study focuses on the employment of the RL on the learning ability of the students in order to improve these methods.

1.8 Research Approach and Methodology

At the beginning state of the research, a literature review is carried out in order to investigate current issues related to RL. The internet is a valuable source for obtaining information related to RL and application of reflective learning techniques.
Next, existing internet based systems that are similar to reflective learning system analyzed and evaluated in terms of their features, ease of use and other elements for good system assessment. The themes and codes were developed based upon a review of the literature as well as the questionnaires spread among students.

The sample comprised 35 postgraduate students (15 Females and 20 males) by questionnaire, enrolled in minimum one course at Faculty of Computer Science and Information Technology in University of Malaya. The students had the opportunities to work in small groups as they contemplated solutions to problems and examine mini cases. The system methodology chosen for design was a waterfall model with prototyping. The main reason on choosing this model was that the system can change at earlier stages if it does not comply with what expected. Besides, it also helps developer to lie out project planning before design and to get the high level view of the system.

1.9 Expected Outputs

It is expected that by completing this research work and developing a website based on internet technology, a reflective learning system is developed. This system could be used to utilize technology to facilitate reflective learning. It is also expected that by developing a questionnaire, useful information on the awareness of reflective learning among postgraduate students in University Malaya (UM) to be obtained.

The website designed in this project should have the abilities of uploading different types of files and easy access for both the tutor and the students to develop a suitable reflective learning environment. This method not only is likely to suit the tutorial programs of Computer Science but also is expected to be used in different majors as well with a simple training.
1.10 Definition of Terms

1.10.1 Reflective learning (RL)

Reflective Learning refers to a great or deeper degree of processing material to be learned. Whereas, in non-reflective learning material is simply taken in, with little or no active thinking (e.g., memorization) or understanding. Reflective learning engages a large amount of the learners thinking or cognitive capacities. Related terms/concepts include: deep level processing, critical thinking, and relativistic thinking.

1.10.2 Usability

Scholtz (2004) referred to Usability of a product as “the extent to which the product can be used by specified users to achieve specified goals with the effectiveness, efficiency, and satisfaction in a specified context of use. At its simplest, defined by Feldstein and Neal (2006), “usability is a measure of how easy it is for a user to complete a task.”

Conner (2005), noted usability as a generic term that refers to design features that enables something to be user-friendly. It was also mentioned that high usability means a system is: easy to learn and remember; efficient, visually pleasing and fun to use; and quick to recover from errors.

1.10.3 Learnability

Stated by Duchastel (2003), learnability can be another aspect of usability. It is the capability of a software product to enable the user to learn how to use it. Learnability is the major concern in the design of complex software applications. Another attribute of usability, i.e. learnability is studied concerning the evaluation of the
reflective learning products selected for the research project. Conner (2005), also phrased that learnability refers to the qualities of a system or process that help make it easy (and worthwhile) to learn.

1.10.4 Personalized Learning

Nelson (2008) defined personalized learning as engaging the learner through knowing about their reactions to their specific needs which leads to their success in the learning experience. Campbell et al. (2007), noted that personalized learning aims to encourage learners to become more involved in making decisions about what they would like to learn and how.

1.11 Organization of the Dissertation

This dissertation consists of seven chapters. In chapter 1, an overview of the study, including the background, the problem statement, the research questions, the purpose of the study, limitations, significance of the study, and definition of operational terms are presented.

Chapter 2 deals with keywords and concepts through a comprehensive review of related literature regarding technology in education, reflective learning, evaluation of the multimedia products, and developing learning communities. Previous research and studies on journals that have disclosed connection with design, development and evaluation of multimedia tools and, reflective learning in higher education, and online learning are also well reviewed.

In chapter 3 the research methodology proposed for this study, the research design, subject selection, data collection methods, and strategies for strengthening the
validity and reliability of the study have been fully discussed. Chapter 4 describes the results from the collected data and discusses them in accordance with the research questions. Chapter 5 fully describes the prototype development followed by complete discussion presented in chapter 6. Chapter 7 brings the conclusions of the study and recommendations for future work.