

THE UTM STUDENTS' PERSPECTIVE ON COOPERATIVE LEARNING

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DEDICATION

Especially to mum and dad, sister Sheela, brother Premanan, junior girls (Hemalatha, Lavania and Sharmila), Durga Devi and to a special friend Ganes Kumar.

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ABSTRAK

Kajian ini bertujuan untuk melihat perspektif pelajar terhadap pembelajaran secara kooperatif di Universiti Teknologi Malaysia Johor Bharu, Johor. Kajian ini juga dijalankan untuk mengenal pasti sama ada wujud perbezaan yang signifikan di antara pelajar lelaki dan pelajar perempuan dan perspektif pelajar bagi lapan fakulti terhadap pembelajaran secara kooperatif. Soal selidik telah digunakan untuk mengumpul maklumat mengenai perspektif pelajar terhadap pembelajaran secara kooperatif. Sampel kajian terdiri daripada 291 orang pelajar yang dipilih secara rawak mudah dari pelajar tahun satu hingga tahun lima di lapan fakulti. Soal selidik ini digunakan untuk mendapatkan maklumat tentang pandangan pelajar terhadap pembelajaran secara kooperatif bagi enam kategori iaitu tingkah laku berkaitan dengan bekerja dalam kumpulan, kolaborasi, kefahaman subjek, kemahiran komunikasi, kemahiran interpersonal dan kemahiran menyelesaikan masalah. Data yang diperolehi dianalisis dengan menggunakan sistem perisian SPSS versi 11.5. Ujian t digunakan untuk melihat sama ada wujud perbezaan yang signifikan antara pelajar lelaki dan pelajar perempuan terhadap pembelajaran secara kooperatif manakala ANOVA satu hala digunakan untuk melihat sama ada wujud perbezaan yang signifikan antara perspektif pelajar bagi lapan fakulti terhadap pembelajaran secara kooperatif. Hasil kajian menunjukkan perspektif pelajar terhadap pembelajaran secara kooperatif adalah positif. Kebanyakan pelajar memilih “setuju” bagi pernyataan dalam soal selidik itu. Terdapat perbezaan yang signifikan di antara pelajar lelaki dan pelajar perempuan bagi perspektif terhadap pembelajaran secara kooperatif; manakala, perspektif pelajar bagi lapan fakulti terhadap pembelajaran secara kooperatif tidak menunjukkan perbezaan yang signifikan. Cadangan untuk kajian lanjutan yang mungkin boleh digunakan untuk mengukuhkan kajian ini turut dikemukakan.

ABSTRACT

The purpose of this study is to look at the students' perspective on cooperative learning at Universiti Teknologi Malaysia in Johor Bharu, Johor. This study is also to determine if there is any significant difference between male and female students and between the students' perspective for eight faculties on cooperative learning. The students' perspective on cooperative learning questionnaire was used as the research instrument to look at the students' perspective on cooperative learning. A sample of 291 students which was chosen randomly from first to fifth year was involved in the research. The students' perspective on cooperative learning was divided into six categories, which are Attitude Related to Teamwork, Collaboration, Communication Skills, Understanding the Course, Interpersonal Skills and Problem Solving Skills. Data collected were analyzed by using SPSS software version 11.5. t-test was used to determine if there is any significant difference between male and female students' perspective on cooperative learning while one way ANOVA was used to determine if there is any significant difference between the students' perspective for eight faculties on cooperative learning. Result shows that, the students' perspective on cooperative learning are positive. Most of the students chose "agree" response for the statements in the questionnaire. There are a significant difference between the male and female students' perspective on cooperative learning but not for the students' perspective for the eight faculties. Several recommendations were made at the end of the report for further research.

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LIST OF SYMBOLS

CL	-	cooperative learning
CTL	-	Center For Teaching and Learning
UTM	-	Universiti Teknologi Malaysia
ERIC	-	The Educational Resources Information Center
STAD	-	Student Teams-Achievement Divisions
TGT	-	Teams-Games-Tournaments
TAI	-	Team Assisted Individualization
CIRC	-	Cooperative Integrated Reading and Composition
SMET	-	Science, Mathematics, Engineering and Technology
LPSS	-	Learning Preference Scale-Students
CSLP	-	Center for the Study of Learning and Performance
SPSS	-	Statistical Package for Social Science
ITTHO	-	Institute Teknologi Tun Hussein Onn
PBL	-	Problem-based Learning
FP	-	Faculty of Education
FS	-	Faculty of Science
FKM	-	Faculty of Mechanical Engineering
FKE	-	Faculty of Electrical Engineering
FKA	-	Faculty of Civil Engineering
FAB	-	Faculty of Built Environment
FPPSM	-	Faculty of Management and Human Development
FKKKSA	-	Faculty of Chemical and Natural Resource Engineering

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CHAPTER 1

INTRODUCTION

1.1 Introduction

The Malaysian Ministry of Education has mandated that students in Malaysia become critical, creative and articulate thinkers who are technologically competent (Seventh Malaysian Plan, 1996). Recognizing that to succeed in a modern society, students must be able to think independently and work collaboratively, the Ministry has stated that teachers must encourage active learning. Unfortunately, many teachers in education classes themselves simply lecture about not lecturing (Seventh Malaysian Plan, 1996). The teachers seldom experience different models of teaching.

In most university classes, a lecturer's establishment of herself/himself as the source and evaluator of all information set a questionable standard in a world filled with personal and technological resources. As recognized by researchers in brain-based learning, cooperative strategies provide a way to recognize the classroom so that students accept responsibility for working together to construct their own learning and to become critical and creative thinkers (Ciane and Caine, 1991). This in no way diminishes a teacher's role

in organizing experiences, as well as providing materials, resources, and guidance. This student-centered approach requires a gradual change in teachers' and students' perspectives about the learning process.

Active learning is a class teaching and learning techniques that involves students in learning activities other than passively listening to lectures. The activities include speaking, discussing, reading, higher-level thinking, reflecting, etc. (Khairiyah *et al.*, 2005). Active learning has been shown to enhance learning (Ruhl *et al.*, 1987) this is hardly surprising because learning is a naturally active process (Khairiyah and Mimi, 2003). Students from diverse learning styles can adapt to active learning because it gives the responsibility of organizing what is to be learned in the hands of the learners. Active learning can be applied not only in small classes, but also in very large lecture halls with hundreds of students.

There are many categories of active learning techniques. Cooperative learning (CL) and problem-based learning (PBL), in particular, are widely used in higher education. Other than enhancing learning, CL induces generic skills, such as communication, interaction and interpersonal skills, teamwork and leadership skills, self-confidence and self-esteem, and higher-level thinking skills (Khairiyah *et al.*, 2005).

CL is by no means a new idea. For thousands of years, humans have recognized the value of cooperation in a broad range of endeavors, including education. However, the term cooperative learning seems to date back to the 1970s when a great deal of research and practical work began on discovering how best to harness peer power for the benefit of learning. This work continues to this day. Thus, CL has a strong foundation in research. Many hundreds of studies by now 1000s across a wide range of subject areas and age groups have been conducted (Slavin, 1995).

There is a long history of research on cooperative, competitive, and individualistic efforts. Since the first research study in 1898, nearly 600 experimental studies and over 100 correlation studies have been conducted. The multiple outcomes studied can be classified into three major categories: Achievement/productivity, positive relationships, and psychological health. The research clearly indicates that cooperation compared with competitive and individualistic efforts typically results in a) higher achievement and greater productivity, b) more caring, supportive, and committed relationships, and c) greater psychological health, social competence, and self-esteem. The positive effects that cooperation has on so many important outcomes make CL one of the most valuable tools educators have (Murat Ulasir and Wright, 1999).

Cooperation is not having students sit side-by-side at the same table to talk with each other as they do their individual assignments. Cooperation is not assigning a report to a group of students where one student does all the work and the others put their names on the product as well. Cooperation is not having students do a task individually with instructions that the ones who finish first are to help the slower students. Cooperation is much more than being physically near other students, discussing material with other students, helping other students, or sharing material among students, although each of these is important in CL (Smith, 2001).

CL may occur in or out of class. In class exercises, which may take anywhere from 30 seconds to an entire class period, may involve answering or generating questions, explaining observations, working through derivations, solving problems, summarizing lecture material, trouble-shooting and brainstorming. Out of class activities include carrying out experiments or research studies, completing problem sets or design projects, writing reports, and preparing class presentation (Felder, 1994).

Cooperation enhances student satisfaction with the learning experience by actively involving them in designing and completing class procedures and course content. Effective teams or groups assume ownership of a process and its results when individuals are encouraged to work together toward a common goal, often defined by the group (Panitz, 1999).

CL promotes mastery while passive acceptance of information from an outside expert often promotes a sense of helplessness and reliance on others to grasp concepts. In a typical college classroom that emphasizes lecturing there is little time for reflection and discussion of students' errors or misconception. In the CL paradigm, students are continuously discussing, debating, and clarifying their understanding of the concepts (Panitz, 1999).

1.2 Research Background

The problem is that no two students are alike. They have different backgrounds, strengths and weaknesses, interests, ambitions, senses of responsibility, levels of motivation, and approaches to studying. Teaching methods also vary. Some instructors mainly lecture, while others spend more time on demonstrations or activities; some focus on principles and others on applications; some emphasize memory and others understanding. How much a given student learns in a class is governed in part by that student's native ability and prior preparation but also by the compatibility of the student's attributes as a learner and the instructor's teaching style (Felder and Brent, 2005).

This is not to say that instructors should determine their students' individual learning attributes and teach each student exclusively in the manner best suited to those

attributes. It is not possible to discover everything that affects what a student learns in a class, and even if instructors could, they would not be able to figure out the optimum teaching style for that student—the task would be far too complex. Moreover, even if a teacher knew the optimum teaching styles for all students in a class, it would be impossible to implement them simultaneously in a class of more than two students (Felder and Brent, 2005).

Learning styles are “characteristic cognitive, affective, and psychological behaviors that serve as relatively stable indicators of how learners perceive, interact with, and respond to the learning environment”. The concept of learning styles has been applied to a wide variety of student attributes and differences. Some students are comfortable with theories and abstractions; others feel much more at home with facts and observable phenomena; some prefer active learning and others lean toward introspection; some prefer visual presentation of information and others prefer verbal explanations. One learning style is neither preferable nor inferior to another, but is simply different, with different characteristic strengths and weaknesses. A goal of instruction should be to equip students with the skills associated with every learning style category, regardless of the students’ personal preferences, since they will need all of those skills to function effectively as professionals (Felder and Brent, 2005).

Teaching and learning techniques that becomes the attention among the teachers in higher education is the active learning methods, especially CL. Chickering and Gamson (1987) had collected a lot of the research and papers about the higher education levels. They had created seven principles of good techniques in higher-level students. One of the principles is:

Learning is not a spectator sport. Students do not learn much just sitting in classes listening to teachers, memorizing pre-packaged assignments and spitting out answers. They must talk about what they are learning, write about it, relate it

to past experiences, and apply it to their daily lives. They must make what they learn part of themselves.

(Chickering and Gamson, 1987: 4)

There are people who still do not understand and believe the effectiveness of this method. From the literature review, there are teachers in higher education using the traditional technique as the one and only technique on teaching and learning in classroom (Bonwell and Eison, 1991). The teachers do not want to use CL because they believe this approach is just an alternative and could not increase the teaching and learning process compared to the traditional teaching techniques (Chickering and Gamson, 1987). To learn effectively, students need to do more than just listening.

When active learning techniques were used in the classroom, teachers still have to give lecture. Although in traditional method teachers just disseminate information to the students. But, it will create problems among the students and the teachers (Chickering and Gamson, 1987).

According to Hamm and Adams (1992), benefits of CL to student improves academic performance among high- and low- achieving students, minority students have made consistently favorable achievement in cooperative classes, disadvantaged students significantly benefit from collaborative learning techniques, working in mixed-ability groups doesn't stifle individual initiative, positive effects on students' self-esteem, enhances social race relations and attitude toward mainstreamed students.

By teaching others, all of the students actually come to understand the material better. Children's cooperative behavior was shown to transfer through interaction with

peers who weren't members of the same learning teams. It also transferred their good behavior in social situations not structured by the teacher (Hamm and Adams, 1992).

CL is important because it appears to promise positive effects for student in increased academic achievement and improved social attitudes and behavior (Miller and Peterson, 2003). CL also encourages students to engage in the type of discourse about concepts and problem solving that moves them toward more meaningful learning strategies (Towns, 1998). CL activities discovered that the sharing of insights and ideas between students leads to the development of interpersonal and communication skills (Towns and Grant, 1997).

1.3 Cooperative Learning in UTM

In an effort to increase the quality of courses, UTM have gone a step forward to implement a number of innovations in the teaching and learning activities. The Centre for Teaching and Learning (CTL) in UTM is given the task to ensure that the innovation activities are successful. The role of CTL is to help the lecturers to apply different types of innovation in the teaching and learning processes. In addition, CTL also encourage lecturers to carry out research on how to increase the quality of teaching and learning process (Bulletin P&P, April to June 2005).

In UTM, efforts are being made to emphasize the importance of teaching as much as research. To produce quality graduates, UTM had recently come up with attributes to reflect its graduates. UTM graduates shall have sound disciplinary and professional knowledge, high self-esteem and effective skills in communication, good team working, problem solving skills and lifelong learning. To achieve this ambitious

goal, the university is aggressively encouraging active learning techniques, especially CL and PBL to enhance teaching and learning as well as generic skills of the graduates (Khairiyah *et al.*, 2005).

CL and PBL, which are active learning techniques, are currently being widely promoted in UTM among engineering graduates. A bottom-up and top-down approach is taken to ensure a successful outcome. Bottom-up and top-down approaches are taken to promote CL and PBL. A gradual and non-drastic approach is taken to raise awareness and educate lecturers and students on the usefulness techniques. This natural progression is essential in winning the hearts and minds, and thus the support of the academic community.

The bottom-up model consists of student-centered lecturers who form a central committee, called the CL-PBL taskforce or support group, to facilitate the promotion of CL and PBL to all levels of the academic community in UTM. At the faculty level, faculty representatives form a core-group to give closer guidance and/or mentoring. The taskforce and core group members were given training workshops by outside experts; they were then expected to plant the initial seeds of change. Task force members also went for visits to observe PBL in action in institutions of higher learning in Kuala Lumpur and Singapore. Implementations of CL and PBL by the task force and core-group were gathered and documented for evidence and information sharing.

In the top-down execution, the deputy vice chancellor for academic affairs and the Teaching and Learning Unit of UTM plays an active role in promoting CL and PBL to the executive level of the university, the deans, deputy deans, head of departments and lecturers. The deans of all faculties are being reminded from time to time to ensure variations in teaching techniques used in the courses offered.

Educating administrators, lecturers and students on CL and PBL will be the major focus. Road shows on CL and PBL are held at all faculties to create awareness on the need for change in the teaching and learning techniques, and what is active learning, CL and PBL. Evidence of implementations and outcomes in the form of students' performance and response were also shared during the road shows. Other than road shows, technical papers and articles are written to disseminate information on the techniques and implementations.

A lot of courses in UTM were carried out to create the awareness on the important of CL and PBL among the lecturers. The second level of generic skills and the CL course was conducted in the month of September. This was done among the UTM lecturers for various faculties (bulletin P&P, August 2005).

According to Khairiyah *et al.* (2005), UTM is aggressively encouraging lecturer to enhance teaching and learning to produce graduates who are relevant in today's highly competitive world. To achieve this goal, grassroots awareness and training campaign, followed by encouragements are rigorously being made.

Active learning techniques, especially the CL and PBL are currently being promoted across all disciplines as well as levels of studies. This effort, which was initiated by a group of enthusiastic lecturer, received a welcome endorsement from the highest level of university administrative key personnel. A special task force called CL-PBL Support Group was then set up to facilitate the promotion of CL and PBL practices across the board. At implementation level, faculty-based core groups were set up and trained to acquire and apply the necessary knowledge and teaching skills pertaining to these active learning approaches. This study describes strategies and efforts to convince and encourage the implementation of active learning techniques among lecturer and

administrators, especially those in the engineering and engineering-related faculties (Khairiyah *et al.*, 2005).

Workshops were conducted by CTL for the lecturer from various faculties. The aims of the workshops were to get the lecturer understand the philosophy, concepts and objectives of CL. They were also exposed on the necessary skills of using CL methods in the teaching and learning process. It is hoped that they will be able to plan and apply CL in their classrooms. The following topics were discussed by the facilitators in the workshops: Introduction to active and cooperative learning, Why need to change to active and cooperative learning, Informal and formal CL, Planning and implementation of CL, The CL structures, Team formation and dynamics and The assessment of CL.

CL activities may require more planning than the traditional ones. Besides planning for the delivery of content, they also need to plan the students' activities and way to evaluate the students' understanding. Timing is especially important in the CL settings. The planning should involve developing CL activities and grading, time management, assessment tools and readiness and facilitation skills as well.

Lecturers, who wish to apply CL in the classroom for the first time, should start gradually. They should follow the following simple steps: To get the personal information and peer evaluation of the students, to establish rules and regulations and to brief on CL and motivation to the students. Team formation and teambuilding should also be included in these steps. Before starting a lesson, he has to identify parts and the activities for the CL and to estimate the time required for the activities.

Engineering curricula worldwide have emphasized on the usage of groupwork as one method of improving the interpersonal and teamwork skills among the graduates.

These activities, in which students teach and learn from each other, provide ways for students to explore new paths and consolidate understanding. Hence, a study was carried out to assess the practice of group-work among lecturers and final year undergraduate students at the Faculty of Chemical and Natural Resources Engineering, Universiti Teknologi Malaysia. Results showed that lecturers and students of the faculty had positive perceptions towards group-work activities (Mohd Zaki and Talib, 2003).

The two greatest concerns of employers today are finding good workers and training them. The difference between the skills needed on the job and those possessed by applicants, sometimes called the skills-gap, is of real concern to human resource managers and business owners looking to hire competent employees. While employers would prefer to hire people who are trained and ready to go to work, they are usually willing to provide the specialized, job-specific training necessary for those lacking such skills. Finding workers who have generic or job readiness skills that help them fit into and remain in the work environment is a real problem. UTM has launched its list of graduate attributes in the second quarter of 2004 in which the university believes will enable its graduates to function effectively in a wide range of social and professional contexts. A class of forty final year undergraduate chemical engineering students were asked to score their competencies on the seven attributes listed by the university and to give suggestions on ways of improving the skills required in the class room environment. Result showed that having been exposed to active and CL styles students ranked themselves quite high in communication, teamwork and problem solving and quite moderate on other attributes. Students were found to be greatly excited with the opportunities of giving presentations and public speaking in the class (Mohd Zaki, 2005).

CL is a proven teaching technique that is able to enhance students' learning through active learning. This technique has been widely accepted in engineering education in the United States, Europe, United Kingdom and Australia. In UTM,

lecturers from different faculties of engineering implement CL in their classes. The main aim is to induce better retention, in-depth understanding and mastery of knowledge among students. This paper shows how CL successfully enhanced students' learning by looking at the performance of their grades in different engineering classes (Mimi *et al.*, 2004).

It shows UTM is actively encouraging academic staff to be aware in the use of the active learning techniques in classroom. Three different techniques are involved in teaching and learning process, namely cooperative learning, generic skills and problem-based learning.

1.4 Statement of Problem

To produce quality graduates, UTM had recently come up with attributes to reflect its graduates. UTM graduates shall have sound disciplinary and professional knowledge, high self-esteem and effective skills in communication, good team working, problem solving skills and lifelong learning. To achieve this ambitious goal, the university is aggressively encouraging active learning techniques, especially CL (Khairiyah *et al.*, 2005). Some of the faculties and lecturers are using the cooperative learning approach in the classroom (CTL, Centre for Teaching and Learning, 2005). A study has not been carried out to see the students' perspective on this approach. So, this study is to analyse the students' and faculties perspective on cooperative learning for six categories: Attitude Related to Teamwork, Understanding the Course, Collaboration, Interpersonal Skills, Communication Skills and Problem Solving Skills.

1.5 Objectives

The objective of this study is:

1. To look at the students' perspective on cooperative learning for six categories: Attitudes Related to Teamwork, Understanding the Course, Collaboration, Interpersonal Skills, Communication Skills and Problem Solving Skills.
2. To determine if there is any significant difference between male and female students' perspective on cooperative learning
3. To determine if there is any significant difference between students' perspective for the eight faculties on cooperative learning.

1.6 Research Questions

This study is carried out to answer the following research questions:

1. What is the students' perspective on cooperative learning for the six categories?
2. Is there any significant difference between male and female students perspective on cooperative learning?
3. Is there any significant difference between students' perspective for the eight faculties on cooperative learning?

1.7 The Importance of the Study

The main purpose of this study is to look at the students' perspective on cooperative learning on many different courses and faculties. Cooperative learning can help students to improve a lots of skills in daily life when compare with the normal traditional learning method. Students also can determine the important skills to bring about success in a team of cooperative learning group.

This study will help the lecturers know the students' perspective on cooperative learning. The lecturers can plan the teaching and learning methods which suitable for the students. The students' perspective on cooperative learning will motivate the lecturers to continually use the cooperative learning techniques in the classroom.

This study will benefit CTL to encourage all the other lecturers to apply cooperative learning instruction in the classroom. This will help to increase the strategy of teaching and learning in the university.

1.8 Scope of Study

The scope of this study is to look at the students' perspective on cooperative learning on many different courses and eight faculties in Universiti Teknologi Malaysia.

The students' perspective on cooperative learning, a questionnaire was modified and used. The items in the questionnaire is contain of six categories: Attitudes Related to

Teamwork, Understanding on the Course, Collaboration, Communication Skills, Interpersonal Skills and Problem Solving Skills in the questionnaire.

1.9 Limitations of Research

This study was conducted on the UTM students, who involved with cooperative learning in semester one 2005/2006. They are from the eight different faculties in UTM: Faculty of Education, Faculty of Science, Faculty of Chemical and Natural Resource Engineering, Faculty of Electrical Engineering, Faculty of Mechanical Engineering, Faculty of Management and Human Resource Development, Faculty of Built Environment and Faculty of Civil Engineering. All the faculties were chosen except the Faculty of Geoinformation Science and Engineering and Faculty of Computer Science and Information System because it does not involve with cooperative learning.

We assumed that students already exposed to cooperative learning in classroom by the lecturers. This study cannot be generalized to all the university around the Malaysia, because it involved only one university that is UTM and the respondent are students from the eight faculties only.

1.10 Operational Definition

The operational definition is to describe the words used in this study according to the context of the study.

1.10.1 Cooperative Learning

CL has emerged as a “new” approach to classroom instruction. It involves a number of people working to complete an assigned task (Towns and Grant, 1997). CL is a philosophy that gives teachers and students the skills to work effectively in teams, large or small (Jongste, 1996). This is a very wide definition of cooperative learning.

CL may be simply defined as students working together in small groups (Lumpe et al., 1998) to maximize their own and each other’s learning (Johnson & Johnson, 1999). CL is structured, systematic instructional strategy in which small groups work together to produce a common product (Cooper, 1990).

Panitz (1999) define more specifically that CL as a motivational strategy includes all learning situations in which students work in groups to accomplish particular learning objectives and in which they are interdependent for successful completion of the objective. This is similar with Chang (1999) definition that is CL is a teaching strategy in which students work together in heterogeneous groups (Watson and Marshall, 1995) and use a number of activities to achieve academic objectives and improve their understanding of subject matters.

In this study, the definition of CL is a learning situation which students work together in a group to complete an assigned task and a number of activities to achieve academic objectives and applied the six categories that are on attitudes related to teamwork, understanding, collaboration, interpersonal skill, communication and problem solving skills.

1.10.2 Perspective

Perspective is a view or prospect, a particular way of regarding something and understanding of the relative importance of things (Concise Oxford English Dictionary, 2004). Perspective also defines as a certain point of view in understanding of judging things or events, especially one that shows them in their true relations to one another (Basic Dictionary of American English, 1998).

In this study, the definition of perspective is a certain point or view of the students in understanding the important of cooperative learning in classroom.