

STUDENT CENTERED LEARNING – AN EXPERIENCE OF THE KUKTEM'S PRACTICE

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INTRODUCTION

This paper is concerned with implementing student-centered learning in KUKTEM's classroom. It examines the previous students' experience in this approach, their favourite and expectations of the teaching methods applied during their study in KUKTEM. This paper is more concerned with the practice of student-centered teaching specifically on how the university teacher can help students to become more responsible in their own learning. It also views some 'bumpy road' during the practice of student-centered learning.

It is important for the teacher to understand and to master the teaching techniques as a means of increasing teaching effectiveness. It is not true to say that 'there must be one particular technique that becomes the most effective way of teaching' because there is no evidence to prove it. However, lecture method has been classified as traditional and has been criticized for its effectiveness. A study conducted by the Directors of Training in the United States regarded lecture as the least effective method of knowledge delivery. The main reason is that this technique does not involve students in learning activities. Many studies show that the use of lecture as the only mode of instruction presents problems for both the teachers and the students due to a number of reasons: First, the class will become dull and boring because it is an information based learning, second, it is a one way communication, therefore students become passive listeners and third, the students do not participate in learning (Cook & Cook,1998).

In the classroom of 21st century, the role of the teachers is to facilitate learning by coordinating learning resources and help students to learn to ask the right questions. Teachers must guide students to get vast information and to develop their skills in critical thinking, problem solving and decision making suitable to the needs of the workplace. Therefore, student-centered teaching approach is encouraged in which students can participate in the learning activities (Tsang-Kosma, 2004).

STATEMENT OF THE PROBLEM

Recently, the top management of KUKTEM threw around the term 'student-centered learning' to its teachers, but no in-service courses were arranged on this 'subject' in order for the teachers to practise this approach. With this new proposal, the KUKTEM teachers will have to change their teaching culture from 'sage on the stage' to 'guide on the side' meaning that they have to shift from teaching to facilitating. For this reason, KUKTEM has to come up with the systems in order to change the mindsets of its teachers and to show them how to make classrooms active learning environments.

We understand that the soft skills (or social skills) are great asset for students to possess in order to prepare themselves for employment (see for examples, Rees et al, 1989; Mahaleel, 2002; Abdullah, 1998). Many studies suggest that the student-centered learning is able to develop social skill to align students with the skills needed in the workplace (Felder and Brent, 1996; Tapscot, 1999). Furthermore, the emerging issues regarding our education system strengthened the effort of KUKTEM to emphasize its teachers to practice student-centered learning.

One of the issues, as claimed by the employment of various disciplines such as science, technology and engineering, is about the skill deficit of the graduates. Most of the issues are not talking about inadequacy of the work related skills, but they are talking about inadequacy of other skills such as personal and social skills. Earlier, there was a statement by the Chairman of Federation of Manufacturing Malaysia (FMM), Mr Hoong (1989, p.4) who explained that the graduates from technical institutions in Malaysia were not adequately prepared and did not match with what industrial sector needs when he said “there is a gap

between skilled jobs and the supply of skilled manpower”.

Most recently, a number of statements which discussed the same issue have been raised for example, the Deputy Minister of Science, Technology and Innovation, Datuk Kong Cho Ha (Utusan Malaysia, 19 Jun 2004, p. 10) suggested that our education program should be able to train and produce human resources suitable with the labor market needs. As such, they must be competent in various disciplines and must be integrated. He also suggested our education should create teaching system that is creative, innovative and must be at a world class. Former Deputy Minister of Education, Tan Sri Musa Hitam were also highlighted the same statement when he said current Malaysian education system should be revised so that we can produce marketable graduates.

Considering the above issues, and realizing the importance of having graduates with multiple skills, KUKTEM takes much effort to develop its graduates with marketable skills based on KUKTEM's core product – technical knowledge, technical skill and soft skill. Soft skills (generally called social skills) such as communication skill, leadership skill, teamwork and problem solving skill are supplement to the work related skills. Students with these skills will have some value-added and will benefit them when searching for a job. To realize this, teachers in KUKTEM are encouraged to shift their traditional technique of teaching to a new approach called student-centered learning suitable with the aim to expose the students with hands-on experience. Even though these university teachers use this new approach successfully in their classes, our concern is that not all of the teachers can implement this appropriately since most of them have no teaching experience. As a university college, hands-on experience of the students becomes the prime concern. It is the aim of the university to produce not only engineer with critical knowledge, but an engineer who knows how to practise the knowledge.

WHY DO WE NEED TO UNDERSTAND THE LEARNING STRATEGY?

The term 'learning strategy' is not uncommon to those who are in the teaching profession but to what extent they implement the strategy is of our concern. Everybody knows that by applying appropriate strategy in teaching will attract and give better understanding to students. But at the same time most of the teachers are unaware of the strategy that have the potential to develop generic skills if implemented properly such as the student-centered learning strategy. Student-centered learning make students actively involve in learning and also change the role of the teachers from 'sage on the stage' to 'guide on the side' (Rosenberg, 2001). Since teachers are not aware of the benefit and do not seriously implement it in a classroom, we cannot measure the degree of its success. As a result, the teachers continue to practice lecture method which dominates the learning strategy of the institution making students to be cultured with the concept of 'spoon feeding'.

When the Ministry of Education introduced smart schools in 1999, smart pedagogy changed the teacher's role to more of a facilitator. Smart classes were then introduced in the following years making more teachers familiar with that approach. This will increase the number of schools which adopt the strategy that involved students in the learning activities. Nevertheless, most school teachers are unaware of the type of strategy they carry. One of the Science teachers said that she normally involved students in teaching such as group work and play games but never concerned about the type of strategy she used. The term student-centered learning is new to her. A study on 180 first year students in KUKTEM shows the changing style of learning in schools. Table 1 below illustrates the data of the respondents.

Table 1. Respondents from different origin

State	N	State	N
Kelantan	26 (14.4)	Perak	15 (8.3)
Terengganu	21 (11.7)	Kuala Lumpur	5 (2.8)
Pahang	27 (15.0)	P. Pinang	5 (2.8)
Johor	18 (10.0)	Kedah	12 (6.7)
Melaka	14 (7.8)	Perlis	5 (2.8)
N. Sembilan	5 (2.8)	Sabah	8 (4.4)
Selangor	15 (8.3)	Sarawak	4 (2.2)

The respondents are students from various types of schools and are randomly selected. Table 2 indicates students from two different types of schools namely the ordinary school and boarding school. Students from the ordinary school (including the technical school) dominates the population of KUKTEM. Table 3 represents respondents from different faculties. KUKTEM is now operationalizing five faculties namely, The Faculty of Electrical and Electronics Engineering, Faculty of Chemical and Natural Resources Engineering, Faculty of Computer System and Software Engineering, Faculty of Mechanical Engineering, and Faculty of Civil and Environmental Engineering.

Table 2. Respondents from different types of schools

Type of School	N	%
Ordinary School	136	75.6
Boarding School	44	24.4

Table 3. Respondents from different faculties

Faculty	N	%
Electrical and Electronics Engineering	40	22.2
Chemical and Natural Resources Engineering	41	22.8
Mechanical Engineering	48	26.7
Civil and Environmental Engineering	34	18.9
Computer Science and Software Engineering	17	19.4

The following table shows the rating from students on the implementation of various teaching methods in their former schools. The five Likert scales are used to range from 1 (represents disagree) to 5 (represents strongly agree). Table 5 shows their favorite methods whilst the methods that they expect to be implemented at their place of study is shown in Table 6.

Table 4. Students Rating on the teaching methods in their schools

School/ Strategy	Lecture	Discuss	Group Discuss.	Simul.	Demo	Inquiry Discovery	Outside Class
Total	3.47	3.99	3.76	3.26	3.56	3.21	3.02
Ord. School	3.43	3.99	3.74	3.15	3.59	3.28	3.05
Board. Sch.	3.59	4.00	3.82	3.59	3.48	2.98	2.91

Table 5. Favorite methods of teaching

School/ Strategy	Lecture	Discuss	Group Discuss.	Simul.	Demo	Inquiry Discovery	Outside Class
Total	2.81	4.14	4.13	3.96	4.25	3.96	4.01
Ord. School	2.76	4.15	4.18	3.90	4.22	3.95	4.02
Board. Sch.	2.95	4.11	3.98	4.14	4.34	4.00	4.00

Table 6. Methods of teaching expected to be implemented in KUKTEM

School/ Strategy	Lecture	Discuss	Group Discuss	Simul.	Demo	Inquiry Discovery	Outside Class
Total	3.15	4.30	4.31	4.18	4.38	4.05	4.03
Ord. School	3.06	4.30	4.34	4.17	4.39	4.02	4.04
Board. Sch	3.40	4.30	4.25	4.23	4.33	4.44	4.00

A comparison were also made just to see the degree of the teaching methods that have been practised in schools and the expectations on the methods that the students hope to be implemented in their place of current study. Data in Table 7 illustrates the findings.

Table 7. Rating on methods of teaching practiced in schools as compared to expected methods to be implemented in KUKTEM

Strategy	Lecture	Discuss	Group Discuss.	Simul.	Demo	Inquiry Discovery	Outside Class
At School	3.47	3.99	3.76	3.26	3.56	3.21	3.02
At U-Tec	3.15	4.30	4.31	4.18	4.38	4.05	4.03

Although lecture method is still necessary, students are hoping for other methods of teaching to be implemented during their study in KUKTEM. Favourite method is no more on lecture, yet it becomes the least favourite method. Generally, students show their favour on various kinds of teaching methods especially class discussion, group discussion and demonstration.

Bob Pike of Creative Training Techniques International, Minneapolis has prepared the rule for training in which there should be no training module involve lecture for more than 90 minutes. Mode of teaching will change in every twenty minutes, and they will try to involve students for every eight minutes. A book written by Tony Buzan entitled "Use Both Sides of Your Brain" also states that adult can listen and understand within ninety minutes whilst they can listen and think creatively within twenty minutes.

Despite this finding, KUKTEM still appreciate and does not advocate complete abandonment of lecturing. This is because lecture method is still required in delivering a lot of information in a short time or it is suitable when delivering a lecture to a large number of students. The teacher's primary functions such as designing assignments, tests and grading are still necessary.

WHAT IS STUDENT-CENTERED LEARNING?

"Student-centered learning" is where students work in both groups and individually to explore problems and become active knowledge workers rather than passive knowledge recipients (Harmon and Hirumi, 1996). It is a broad teaching approach whereby the teacher replaces lecture with active learning, integrating self-paced learning and cooperative learning. Ultimately, in student-centered learning the students are responsible for their learning in which they can construct their learning by actively seeking their own information (Nanney, 2004). The role of the teacher here is to help students to access, organize and transfer information in order to find answers. In student-centered learning, students learn how to learn through inquiry, discovery and problem solving. These processes require students to use higher level thinking skills such as analysis, synthesis and evaluation.

WHY STUDENT-CENTERED LEARNING?

All we need today is to develop marketable skills to students. As we know, training institutions are at a slip from what corporate Malaysia requires of its workers. The education system and the industrial system need more alignment otherwise there will be a mismatch of skilled workers entering the workplace. A paper presented by a Proton's Chief Executive Officer, highlighted the importance of social skills in the workplace especially the communication skill (Mahaleel, 2002). Student-centered learning is one way to develop those skills because it involve criterias such as depth, cognitive and social skills, personal growth, and social maturity (Motschnig-Pitrik, 2004). All these are aimed to achieve a number of its key elements such as:

- Problem-solving
- Team skills
- Learning how to learn
- Continuous improvement
- Interdisciplinary knowledge
- Interacting and processing information
- Technology integral learning (Cook and Cook, 1998)

Even though student-centered learning may not be the cure all for the ailing education system, it is a step in the right direction by aligning skills from the workplace and using it in the classroom setting. Referring to the article by Chickering and Ehrmann, "Implementing the Seven Principles: Technology as Lever" about the seven good teaching practices, student-centered approach lead the way to those practices such as:

1. Good practice encourages interaction between students and faculty.

Frequent student-faculty contact in and out of class is the most important factor in student motivation and involvement.

2. Good practice encourages interaction and collaboration between students.

Learning is enhanced when it is more like a team effort than a solo race. Good learning, like good work, is collaborative and social, not competitive and isolated. Working with others often increases involvement in learning. Sharing one's ideas and responding to others improves thinking and deepens understanding.

3. Good practice uses active learning techniques.

Learning is not a spectator sport. Students do not learn much just sitting in classes listening to teachers, memorizing prepackaged assignments, and spitting out answers. They must talk about what they are learning, write reflectively about it, relate it to past experiences, and apply it to their daily lives. They must make what they learn part of themselves.

4. Good practice gives prompt feedback.

In getting started, students need help in assessing their existing knowledge and competence. Then, in classes, students need frequent opportunities to perform and receive feedback on their performance.

5. Good practice emphasizes time on task.

Allocating realistic amounts of time means effective learning for students and effective teaching for faculty.

6. Good practice communicates high expectations.

Expecting students to perform well becomes a self-fulfilling prophecy.

7. Good practice respects diversity --- talents, experience, and ways of learning.

Different students bring different talents and styles to college. Brilliant students in a seminar might be all thumbs in a lab or studio; students rich in hands-on experience may not do well with theory. Students need opportunities to show their talents and learn in ways that work for them.

Taken from: <http://www.aahe.org/technology/ehrmann.html>

THE KUKTEM'S PRACTICE

Clearly, when we practice student-centered learning, some of the burden in communicating with learning materials fall on the students. Fortunately, KUKTEM is employing e-Community in its efforts to provide students with smart learning. The system enables students to communicate virtually with all the

community in KUKTEM as well as with the public. The technology helps KUKTEM to implement e-Learning, hence, makes student-centered learning a reality. Nevertheless, there are factors that must be overcome such as:

1. To change the mindsets of the teaching staff.
2. Staff with no teaching experience.
3. Staff with teaching experience but are cultured by traditional practice.
4. Classroom environments are not in the appropriate setting.

In response to these factors, we draw back the work of Felder and Brent (1996) in their “Navigating the Bumpy Road to Student-Centered Instruction”. We use the time extensively to provide awareness programs and teaching workshop to our teachers. Along with the workshop, we provide these teachers the opportunity to do teaching practice through microteaching programs, and then assist them in teaching a real classroom. Moreover, each faculty Dean is responsible for continuously supervises his faculty members' practice.

We know the worries that teachers have about the methods we advocate. We also know that some senior students view the approach as a threat or as some kind of game when they spontaneously argued with statements such as “like a school” and said “class stand, thank you sir” when the teacher walked out of the class. Classrooms are no more in the traditional look when student tables are arranged in student-centered learning environment. The role of the KUKTEM teachers is to understand how the process work and take the resistance from students or colleagues (if any) as part of the journey.

REFLECTION FROM THE KUKTEM'S PRACTICE

In the remainder of this paper, we provide feedback from teachers in KUKTEM who have practiced student-centered teaching. Some of the feedback voiced the same concerns as highlighted by Felder and Brent (written in *italic*). Responses to the feedback are offered based on literature and experience.

I afraid I cannot finish the syllabus if I practice student-centered learning.

If I spend time in class on active learning exercises, I'll never get through the syllabus.

In most classes, teachers recite notes displayed on the screen, the students try their best to understand. A set of information flows from one set of notes to the other does not guarantee that everyone can understand. Felder and Brent (1996) suggest that productive approach is to put portions of the selected points and diagrams in an e-note, leaving gaps to be filled as an exercise using challenging questions. Spend class time only on the most critically important and conceptually difficult parts of the notes, leaving the students to cover the rest for themselves. It is a good practice if the teacher can announce that the materials (in e-note) will be the subject of test questions so that students will read or work on it.

It is difficult to control the class

If I don't lecture I'll lose control of the class.

Every student should be given the responsibility so that they are involve in learning activities. Teacher should not busy with his or her own work, rather, he or she must play the role as a facilitator. Remind students that they will be asked to give the feedback at the end of the class session.

There are students who become “passengers” when they work in groups.

If I assign homework, presentation, or projects to groups, some students will “hitchhike,” getting credit for work in which they did not actively participate.

Students who do not actually participate in group work will generally fail the tests especially the assignments are challenging and tests truly reflect the skills involved in the assignment (Felder and Brent, 1996). There are suggestions to overcome this problem: First, to have team members individually or collectively distribute the points for an assignment among themselves in proportion to the effort each one

put in, and second, to call randomly on individual team members to present sections of project reports with everyone in the group getting a grade based on the selected student's response.

I have to do lecture first otherwise they cannot work in a team. They don't understand anything.

Sometimes lecture is necessary but not as a primary tool for teaching. Alternatively, brainstorming or question-answer activities can be part of the tool in delivering knowledge.

Every time we want to form a group, students have to arrange the table. It is time consuming and noisy.

This is why we permanently arranged the table in a group-like setting. This makes the students feel that they are in the society and not isolated. Student just need to move the chair to face the teacher in a short while for a briefing or a short lecture.

Too many groups in a class. It is hard to facilitate them.

Twenty students in a class is ideal especially when teaching engineering and medical subjects.

It is believed that more teacher concerns will be discovered as experienced by Felder and Brent (1996) and we also convinced the benefits that the students and the teachers will get if they properly practice student-centered learning. Obviously most students give positive response to student-centered learning as they think this can help them to understand better.

CONCLUSION

It is a difficult to change the paradigm of everyone especially if the promised benefits do not come immediately or automatically. In practicing student-centered learning, the teachers have to be patient in facing resistance from different circumstances. The number of students and logistic contribute significant factors to the success of student-centered learning practice. Actually, student-centered learning, when use properly, can change the face of education into a life long learning process. This is where the students seek solution to problems without complete dependency on the teacher.

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