

Engineering Education in University of Malaysia Pahang: Students' Views on the Teaching Styles of Their Lecturers

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ABSTRACT

University of Malaysia Pahang (UMP) places much emphasis on how to involve its students actively in the learning process. As such, the student-centered learning (SCL) approach is taken as a mode of teaching mainly to develop multidisciplinary skills in its graduates. Most of the lecturers in UMP are young and lack experience; therefore, they are less likely to use the SCL approach in their teaching. The aim of this key case study was to examine the teaching styles of the lecturers in UMP. Students' views on the teaching styles of their lecturers and the methods that the students want their lecturers to practice are believed to reflect students' learning styles. About 121 lecturers and 1,200 students were involved in this study. Students' views on the styles of teaching were analyzed and revealed to all lecturers for their reflection and improvement. Most students in UMP were highly concerned about the teaching methods of their lecturers so as to make their learning more effective. These methods can possibly complement the SCL practice in UMP.

INTRODUCTION

Universiti Malaysia Pahang or previously known as University College of Engineering & Technology Malaysia is the 16th public university of Malaysia that was established mainly to offer engineering education in various fields from degree up to advanced degree levels. The university has set the goal to implement active learning in the classroom mainly to develop generic skills as well as work related skills to prepare the graduates with the skills needed in the workplace. This effort is for the graduates to become valuable persons and easily enter the job market.

In order to ensure that such learning has come into practice according to what has been planned, UMP's lecturers have been exposed with different techniques and methods of teaching through numerous training organised by the Academic Staff Development Centre of UMP. Along with that, teaching capability of the lecturers has always been monitored and assessed for their improvement.

In the effort to increase the teaching effectiveness, the university has first examined the students' favourite styles of teaching approaches that should be carried out by the lecturers so that the lecturers can re-align their teaching styles to suit with the students' learning styles. Students will gain more knowledge, retain more information, and perform far better when teaching styles match with learning styles (Lage et al, 2000).

It is important for the university's lecturers to understand and to master teaching techniques as to increase their teaching effectiveness. It is inappropriate to claim for a certain technique as the best way of teaching since there is no evidence to proof it. However, a sole lecture has been classified as 'traditional' and has been criticised 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 the 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, secondly, it is a one way communication, therefore students become passive listeners and thirdly, 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, teaching requires styles that involve students who participate actively in the learning activities (Tsang-Kosma, 2004).

STATEMENT OF THE PROBLEM

UMP has set a target for the lecturers to score at least 70 pc from students' evaluation in the year 2006 and increase to 80 pc in 2007. Although almost all UMP lecturers achieved the target (for year 2006), most lecturers still fail to practice active learning in the classrooms. Comments from students clearly justify the current situation of classroom environment although a series of teaching and learning courses were organised for the new lecturers to improve their teaching styles. Not surprisingly, those who are quite senior in their service still lack exposure in teaching methodologies making them in favour of practicing conventional style of teaching.

Recently, the management of UMP threw around the term 'student-centred learning' to its lecturers in response to the development of work related and soft skills among the students. With this new proposal, the UMP lecturers 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, UMP has to come up with the efforts to change the paradigm of its lecturers and to show them how to make classrooms become active learning environments.

Besides work related skills, soft skills are also 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-centred learning is able to develop soft skills 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 UMP to emphasise its lecturers to practice student-centred 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 do not talk about inadequacy of the work related skills, but they are talking about inadequacy of other skills such as personal and soft skills. Earlier, there was a statement by the previous 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”.

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.

Considering the above issues, and realizing the importance of having graduates with multidisciplinary skills, UMP takes a great effort to develop its graduates with marketable skills based on UMP's core product – technical knowledge, technical skills and soft skills. Soft skills (some called social skills) such as communication skill, leadership skill, teamwork and problem solving skill are of a supplement to work related skills. Students with these skills will have some value-added and will benefit them when searching for a job. In order to make this a reality, lecturers in UMP are encouraged to vary their teaching styles focusing on student-centred learning suitable with the techniques and methods expected by the students (See Table 3). Even though some lecturers have been exposed with relevant training regarding teaching, lecturers have yet to satisfy students with appropriate styles or methods of teaching.

Objectives of the Study

Hence, this study is aimed to investigate students' view on the teaching styles of their lecturers as to align with the learning styles of the students in UMP. In this regard, teaching styles expected by the students were also examined. Matching teaching and learning styles is hoped to compliment student-centred learning approach in UMP. The objectives of this study will be covered by the following questions:

1. How UMP students view the teaching styles of their lecturers?
2. What are the expectations of UMP students on the teaching styles of their lecturers?
3. What style of teaching the lecturers in UMP mainly used?
4. Do the teaching styles match with learning styles in UMP?
5. How far has student-centred learning has been practiced in UMP?

REVIEW OF RELATED LITERATURE

Teaching Styles

Appropriate teaching style is always necessary for the teachers to accommodate various styles of learning. Matching teaching and learning styles will increase retention, make learning relevant, and even enjoyable. There are four categories of teaching styles commonly found in practice: Formal Authority, Demonstrator or Personal Model, Facilitator, and Delegator.

Formal authority teaching style tends to focus on content. This is a teacher-centred approach where the teacher feels responsible for providing and controlling the flow of content while the student is expected to receive the content and assimilate it. Demonstrator teaching style is also teacher-centred where the teacher acts as a role model by demonstrating knowledge and skills, then guiding students in applying such knowledge and skills. Facilitator style is a student-

centred approach whereby the teacher facilitates and focuses on activities. This type of teaching style works best for students who are able to participate and collaborate with other students in their classroom. This style of teaching is able to create active learning. Delegator teaching style is also a student-centred learning approach which tends to place much control for learning on individuals and groups of students. In this style, the teacher tries to design learning activities that necessitate active learning and problem solving.

Learning Styles

Learning styles are simply different approaches or ways of learning. The term 'learning style' is not uncommon to those who are in the teaching profession but to what extent the teachers consider the students learning styles when teaching is of our concern. Everybody understands that when the teachers utilise appropriate methods of teaching that suit with the students learning styles, the teaching will become attractive and give better understanding to students. But at the same time most of the teachers are unaware of the strategy that has the potential to develop generic skills if implemented properly such as the student-centred learning strategy. Student-centred learning gives students the opportunity to use their own style in learning and this makes students actively involve in the learning process (Rosenberg, 2001). Since the 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 process of the institution making students to be cultured with the concept of 'spoon feeding'.

It is widely acknowledged that each individual learner is unique and these individual differences within learners influence their achievement in learning. One crucial issue in learning engineering education is students' learning styles and the teachers' teaching styles. Without adequate knowledge on students' learning styles, the university teachers might adopt their own style of teaching and this could lead to mismatching of styles. Thus, if this happen, it might lead to ineffective teaching. Understanding of students' learning styles will lead to more effective student-centred learning approach because learning styles are the natural way where students learn things in general (Brown, 1994). They are "natural, habitual and preferred way of absorbing, processing and retaining new information and skills (Kinsella, 1995, p.171). In addition, student-centred learning is often defined to be in contrast to traditional instructional approach (Zhenhui, 2001) where teachers play the central roles (Pederson & Liu, 2003). While the notion of student-centred learning itself means teaching should be centred around students, understanding students' learning styles preferences will help teachers to vary their instructional technique so as to match their teaching styles to students' learning styles.

Student-Centred Learning

"Student-centred 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-centred 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-Centred Learning?

All we need today is to develop marketable skills among the 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-centred learning is one way to develop those skills because it involves criteria 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-centred learning may not be the cure for all 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 (2004), "Implementing the Seven Principles: Technology as Lever" about the seven good teaching practices, student-centred learning approach leads 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 will not learn much by 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 have learnt as a 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.

RESEARCH METHODOLOGY

Sampling

This study was designed in two phases. In the first phase, a survey was carried out during semester 01/06 to 180 students as to gain their expectations on the teaching methods that would be implemented in UMP. The respondents were randomly selected from newly registered students of different types of schools. Table 1 indicates students from two different types of schools namely the ordinary school and boarding school. Students from the ordinary schools (including the technical schools) dominate the population of UMP. Table 2 represents respondents from different faculties. UMP is now running five different 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. There were 121 lecturers involved in this study.

Table 1. Respondents from different types of schools

Type of School	N	%
Ordinary Schools	136	75.6
Boarding Schools	44	24.4
N = 180		

Table 2. 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 Systems and Software Engineering	17	19.4

n = 180

Instrumentation

In the second phase, evaluation forms were distributed to all students at the end of the semester 1 06/07 for them to evaluate all lecturers who taught during that particular semester. Students were clearly briefed prior to completing the forms and no time limit was given. Students were aloud to evaluate comfortably therefore no lecturers were required to attend during evaluation. Students were asked to submit the completed forms to Academic Staff Development Centre for the analysis. All written comments were analysed.

RESEARCH FINDINGS

Table 3 illustrates students' expectations on the styles of teaching in UMP. Figures in the table show active learning is highly viewed by the students as compared to lecture technique. This would justify students' learning styles where they tended to participate in the learning activities.

Table 3. Methods or Styles of Teaching Expected to be Implemented in UMP

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
Ordinary Schools	3.06	4.30	4.34	4.17	4.39	4.02	4.04
Boarding Schools	3.40	4.30	4.25	4.23	4.33	4.44	4.00

About 1,203 comments from students were analysed. About 580 comments were found related to teaching methodologies whilst 623 comments were considered unrelated. These include encouragements, praise and some other unrelated phrases such as 'well done', 'the lecturer is cute' etc. Of the 580 comments, eight elements in teaching were found to be important to highlight. They were 'Language/Clarity', 'Interactivity', 'Giving Examples', 'Voice/Communication', 'Technique/Method', 'Giving Exercise/Assignment', 'Sense of Humour', and 'Giving Notes'. Below is the explanation for each element.

Language/Clarity: Students complaint about the unclear explanation. Some lecturers do not use proper English making students hard to understand. Some of their comments include

“Sometimes need to explain more in certain field or parts so that students can fully understand”, “Improve the language”, “Students sometimes do not understand”, and “Pronunciation not clear”.

Interactivity: Students asked for more interaction between teachers and students and students among themselves. Related comments include:

1. Involve students in class
2. More interaction with students
3. Let all students participate in the class
4. More discussion between groups in the class
5. Students must be more cooperate with the lecturer while learning
6. Kelas boring dan meletihkan. Kami perlu banyak aktiviti dan perbincangan dalam kumpulan

Give Examples: Due to unclear explanation or subject difficulty level, students required lecturers to give a lot of examples during teaching so that they understand the subject more easily. Some of their comments are:

1. More exercise and examples during lecture session
2. Conduct more on examples
3. More examples in class
4. More quiz or example question
5. Do more example while teaching

Voice/Communication: This element just to show that some lecturers have a very low voice making students hard to listen to. Students also showed their unpleasant with the lecturers who did not know how to communicate well with the students. Some students' comments are as follows:

1. More communication with students
2. Improve communication and skill
3. Increase voice when teaching
4. Try to communicate with students

Technique/Method: This element requires lecturers to vary their teaching techniques and methods as to make learning fun and lively. Most students expressed their concern on the teaching ability of the lecturers. Some of their comments are as examples given below:

1. Improve your lecturing skills
2. Make class more attractive
3. Try another teaching methods that is efficient
4. Use different environment in learning
5. Need variety in teaching methods

Exercise/Assignment: For better understanding of the subjects, students suggested lecturers to prepare more exercises and assignments for them. For examples:

1. Give more assignment or questions to your students
2. Need more exercise
3. More assignment needed to improve student understanding

4. Do more examples and exercise

Sense of Humour: Sometimes students asked for some jokes while teaching. This can eliminate dull and sleepy classes. Therefore, students requested

1. Use more ways to make learning fun
2. Make class fun for learning

Give Notes: One of students' concerns was the availability of relevant notes. Some of the student complaint the notes given were inadequate or not up to date. Below are some of their comments:

1. I think the lecturer must give notes to students during the teaching process
2. Give lecture notes to students
3. Some notes need to be improved
4. Notes given are useless
5. Try to give notes that are easy to understand

Table 4 shows different view given by the students from different faculties regarding the 'styles' in teaching that concerned them. Teaching styles was valued differently by different faculties. Results show that elements such as technique of teaching, giving exercises, giving assignments and examples, and interactivity received higher concern from the students, hence require these elements to be given greater emphasis by the lecturers during teaching. In general, Table 5 shows hierarchically the 'teaching styles' that should be taken into consideration as to match the students' learning styles for more effective teaching and learning.

Table 4. Rank Order of the Students' View on the Teaching Element (Styles)
Based on Different Faculty

Faculty	Language /Clarity	Interactivity	Giving Examples	Voice/ Comm	Tech/ Method	Exercise/ Assign	Sense of Humour	Giving Notes
FKEE	3	5	1	4	1	2	7	6
FKM	5	3	2	6	2	1	7	4
FKASA	2	8	4	7	1	5	6	3
FKKSA	5	3	4	8	1	2	7	6
FSKKP	6	1	5	5	2	3	7	4
PBMSK	4	1	7	7	2	3	5	6

Table 5. Rank Order of the Students' View on Teaching (Styles)

TEACHING ELEMENTS (STYLES)	FREQUENCY	RANK
Inappropriate Teaching Methods	133	1
Lack Exercise / Assignment Given	99	2
Lack Examples Given	91	3

Class Not Interactive	69	4
Language / Information Not Clear	67	5
Inadequate Notes	61	6
Unclear Voice / No Communication Skills	38	7
No Sense of Humour	22	8

n = 580

Learning Styles of UMP Students

Ideally, learners or students have three common styles of learning. They are visual learners, auditory learners and tactile/kinesthetic learners. Visual learners learn through seeing. These learners need to see the teacher's body language and facial expression to fully understand the content of a lesson. They may think in pictures and learn best from visual displays. Auditory learners learn through listening. They learn best through verbal such as lectures and discussions because they can listen to what others say or they can say things out. Tactile or kinesthetic learners learn through moving, doing and touching. Kinesthetic persons learn best through a hands-on approach, actively exploring the physical world around them. They may find it hard to sit still for long periods and may become distracted by their need for activity.

Students' respond on lecturers' teaching styles is a sign to which learning styles students tend to be bound. Clearly, if all eight elements of teaching are analysed in terms of its characteristics, majority of UMP students are in favour of being kinesthetic and auditory learners because they like moving, doing and involve in discussion. This indicates that UMP students like to participate in learning activities rather than just watching or listening to a lecture. These findings strengthened the data collected earlier with regard to students' expectations on the teaching techniques to be carried out in UMP (see Table 3).

Teaching Styles of UMP Lecturers

Lecturers in UMP have the opportunity to enhance their teaching effectiveness by aligning their styles of teaching to suit with the students' learning styles. From the analysis, comments from students deter the teaching style of UMP lecturers which is Formal Authority in nature. Very few lecturers have demonstrator, facilitator and delegator styles of teaching. In this regard, this paper enlightens few suggestions for matching teaching and learning styles in UMP to enhance teaching and learning effectiveness:

1. Regardless of their level, students in UMP request for more interactive learning as to make better understanding of a lesson. Therefore, lecturers need to plan a lesson so that it creates interaction between students and lecturers as well as students among themselves.
2. Lecturers need to vary their teaching techniques and methods to make their lesson attractive.

3. Students require extra explanation during teaching. As such, lecturers should give more examples and analogies for better understanding of a lesson.
4. Lecturers should plan for a chain of exercises and give more assignments. Students like to practice and explore things.
5. Lecturers need to control their voice and use proper and clear language especially English language when explain to students.
6. Adequate and relevant notes should be given to students. This can help them to revise and enrich their knowledge with relevant materials.
7. Sense of humour is part of good teaching practices. Lecturers with this capability can make their learning process more fun.

Generally, the statements given by the students reflect the kind of teaching approach that should be carried out by the lecturers which is student-centred learning or SCL. With this approach, students have the opportunity to learn at their own pace, hence able to use their own learning styles.

Elements that Matter Students in Teaching	Learning Style	Rank
Inappropriate Teaching Methods	Kinesthetic/Visual/Auditory	1
Lack Exercise / Assignment Given	Kinesthetic	2
Lack Examples Given	Kinesthetic/Visual/Auditory	3
Class Not Interactive	Auditory/Kinesthetic	4
Language / Information Not Clear	Auditory	5
Inadequate Notes	Visual	6
Unclear Voice / No Communication Skills	Auditory	7
No Sense of Humour	Auditory/Visual	8

CONCLUSION

Matching teaching styles and learning styles is crucial if one plans to create effective teaching and learning. Obviously, once students have their own styles of learning, the teachers have to find ways or methods that can suit to everyone' style. This will satisfy everybody in the

classroom. Therefore, many suggest that student-centred learning approach is practical as it allows students to learn freely.

It is difficult to change the paradigm of everyone especially if the promised benefits do not come immediately or automatically. In practicing student-centred learning, the teachers have to be patient in facing resistance from different circumstances. For example, the number of students and logistic contribute significant factors to the success of student-centred learning practice. When student-centred learning is used properly, it 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 albeit learning and teaching styles.

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