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Lecture-Centred or Student-Centered: A Case Study in a Public University

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Abstract
This study is aimed to investigate the current practice of teaching methods among lecturers in Universiti Teknologi Malaysia. A total of 357 lecturers participated in this study. The result showed that the general practice was influenced by lecturer's field and years of teaching experience, not gender, qualification and designation. Comparing the specific teaching methods applied in three fields, it found that lecturers in science and technology used lecture and discussion much more frequently than those from engineering and social science. Among the six specific teaching methods, discussion and lecture were the most frequently used teaching method, which is scored significantly higher than the other four teaching methods. However, an interesting finding was reported when lecturers were asked to rate their preference in the six specific teaching methods. Lecture was rated at the lowest level of preference but it was reported as one of the most frequently used teaching method. It may imply the changes on lecturers' perspectives. Discussion method obtained the highest preference score, which is also applied frequently in current teaching practice.
Keywords: general teaching practice, teaching method, lecturer

1. Introduction

In recent years, institutions of higher education in Malaysia have conducted many workshops and seminars on pedagogical practices to expose lecturers to teaching and learning methods aligned to the learning outcomes in universities. One crucial goal to be achieved is to support students' learning through high-quality teaching, giving constructive feedback to students and having students to be independent learners. Alongside these aspirations, lecturers have to turn away from the teacher-centeredness toward a more student-centered approach to teaching.

Methods of student-centric which are inquiry-based in nature are emphasized rather than lecture-centric methods. As one of the research universities in Malaysia, Universiti Teknologi Malaysia (UTM) has designed UTM Global Plan 2012-2020 as a guideline for the university to move forward to meet the demands of globalisation (Zaini, 2012). Based on the concept of "New Academia", UTM is set to become Entrepreneurial Research University characterized by quality education rooted in deep knowledge culture, high impact contribution and value-driven initiatives. The 'New Academia' aims to make higher education more efficient and effective. One of the ways to achieve this is by the transformation of teaching methods, in which lecturers are expected to apply a variety of teaching methods in order to optimize learning environment to enhance students performance.

There is no one best way of "teaching" (Biggs, 2003). It is a very personal activity. Certain teaching styles and strategies may suit one teacher or lecturer but they might be not appropriate for another (Nicholls, 2002). The cornerstone of teaching is to enhance students learning which involves attempts to alter students' understanding in order to conceptualize phenomena and ideas in the way scientists, mathematicians, historians, physicians or other experts conceptualize them (Biggs, 2003). Pursuing 'good teaching' is always the concern of most universities, which could produce higher-quality student learning (Biggs, 2003).

Although uuniversities encourage lecturers to integrate technology into their teaching, and various technology were already applied, it may not be encouraged to employ a different teaching approach due to the contextual constraints (Saroyan & Amundsen, 2004). Lecture-based instruction remains as a main teaching method which was considered to be the most effective when the goal is to transmit information, and when organization and clarity are desired (Saroyan, 2000). Morrison, Ross and Kemp (2001) indicated that the more interactive teaching methods such as discussion, inquiry-based learning are more effective for higher-order thinking and developing a deeper understanding. Currently, various teaching methods have been practiced in higher education because of the universities' requirement, disciplinary context matters and learning tasks vary (Saroyan & Amundsen, 2004).

UTM has the same concern and challenges as others universities. Innovation of teaching methods is encouraged in UTM to improve the quality of teaching and learning. To find out the appropriate strategies to improve lecturers' teaching, it is necessary and important to investigate the current teaching practice among lecturers in UTM.

2. Problem Statement

Obligation to demonstrate commitment to effective teaching and learning in higher education denotes high expectations in using the best or the most appropriate pedagogical practices to enhance learning and producing powerful and effective individuals for nation building. Given the drive towards professionalizing and enhancing practices in higher education, it has become crucial to examine teaching practices which may reflect inadequacies of teaching in practice.

The authorities in UTM are promoting active and student-centric teaching methods to be employed as delivery methods. Lecture-centric methods are regarded as the 'old' method and less effective to meet up challenges to produce students who are independent in their learning. As UTM has been known as a university with focus on engineering, one may expect lecturers to be more inclined towards the student-centric methods of inquiry-based category.

Parallel to the above statement, questions arise in relation to pedagogical practices among lecturers: Are UTM lecturers using teaching methods which promote active learning? Is inquiry-based learning more popularly adopted than lecture-based method? What are the preference in teaching styles?

In view of this scenario, the actual practice of teaching methods and lecturers' preference was examined to provide data and information as a guide for the authorities to further improve its training courses on teaching methods.

3. Objectives

The objectives of this study is identify the current general teaching practices (GTP) and examine the influence of lecture's characteristics (e.g. gender, field, designation) on GTP; to determine the dominant specific teaching method used by lecturers and their preference in teaching method.

4. Literature Review

There are various pedagogical approaches that could be implemented by lecturers in higher education. However, the effectiveness of each pedagogical approach such as Problem-based Learning might be varied on different students. As an example, in a study by Colliver (2000), he found that there is little evidence on the effectiveness of using Problem-based Learning on students' performance. The development of more student-participatory methods including active learning, student-centered learning, collaborative learning, experiential learning, and problem-based learning are much preferred, but at the same time, the so-called traditional methods such as lecture and demonstration may be deemed relevant and effective. In this vein, even though lecturers or instructors may assume that such pedagogical approach might be effective for the students, yet the effectiveness might be varied and has little impact on students.

Entwhistle (2009) argues that each subject area or discipline has its own 'inner logic'. This logic is based on a structuring of knowledge and key ideas and concepts. Pedagogy must be related to the inner logic and should not be based on a general popular teaching method.

Teaching in higher education covers a range of varied teaching methods. At one end of the continuum, lecturers may feel comfortable with the lecture method. Ideas, concepts, theories are delivered to students who are at the level of maturity to understand them. At the other end of the continuum, lecturers may prefer to transmitt knowledge to students by engaging them in deep-thinking to construct their ideas and finding solutions.

The Boyer Commision (1988) argued that research universities should make Inquiry-Based Learning (IBL) as the standard pedagogical approach in their undergraduate education. Other scholars have argued that IBL should be mainstreamed in all universities (Brew 2003). While IBL is widely advocated, there is relatively little sustained research on IBL at the university level (Helle et al. 2006; Spronken-Smith et al. 2011). This has begun to change in recent years, as can be seen, for instance, from attempts to develop conceptual frameworks (Healey 2005); detailed case studies comparing different forms of IBL (Spronken-Smith and Walker 2010); examination of students' experiences of IBL (Ellis et al. 2007; Ellis et al. 2005; Levy and Petrulis 2011); and impact on student learning outcomes (Justice, Rice, and Warry 2009).

On the other hand, the so-called traditional passive method is much preferred by lecturers based on the content of the courses taught. Charlton (2006) proposed that lectures are effective teaching method because they exploit human and evolved 'human nature' to improve learning. Charlton argued that lectures are probably the best teaching method in many circumstances and for many students; especially for communicating conceptual knowledge, and where there is a significant knowledge gap between lecturer and audience. Even though PBL is widely used in medical schools, lectures still have its impact. Seth, et al. (2010) has studied the medical teachers' preference for various lecture delivery methods and concluded that the dominant form of lecture delivery is still the chalk and talk approach while other teaching aids have their unique advantages and supplementing chalk-borad with PowerPoint (PPT) or Transparencies and OHP (TOHP) enhances the impact of the lecture.

Moving away from the tradition of lecturing in university, lecturers who prefer more interactive teaching strategy may use discussion method. The idea of teaching through classroom discussion has been passed down

from Socrates method – instructor initiated the questioning followed by students to present their opinions to attempt answering questions posed by teachers. Teachers or lecturers have to objectively evaluate students' responses during the discussion and not just agreeing to ideas and opinions from students.
Arguably, universities are in the midst of a genuine revolution in teaching. New information technologies are giving rise to new possibilities. In summary, whatever the teaching method used as instructional method, the practice of simply follow a teaching method that a lecturer has experienced as student before is drawing to a close. Whether the teaching method is considered active or passive, the method should be interactive in nature. Nevertheless, there is no systematic research on the teaching methods that might be varied on different students as found in different programs and courses in UTM.

5. Methodology

5.1 Participant

A total of 357 lecturers from Universiti Teknologi Malaysia (UTM) fulfilled the web-based questionnaire. As shown in Table 1, the sample was made up of 166 male and 191female lectures from three fields (engineering, science and technology, and social science). There were 261 Doctor degree holders and 94 Master holders.

Table 1: sample comparison

	Value Label	N
field	engineering	102
	science and technology	134
	social science	121
gender	male	166
	female	191
qualification	Master	94
	Doctor	261
design	Lecture	85
	Senior Lecture	180
	Associate professor & Professor	91

5.2 Measure

A web-page questionnaire was developed for this research which comprised of items on basic information of lecturers, 8 items on general teaching practice and 22 items related to specific teaching methods and 8 items on preference on teaching method. The 8-item general teaching practice scale was used to assess the current teaching practice on various general teaching techniques and perspectives, such as brainstorming, questioning, and material preparation. The 22-item specific teaching method scale was categorized into 6 subscales which were aimed to examine the current specific teaching methods on 6 types of teaching methods (lecture, demonstration, discussion, cooperative, problem-solving, inquiry-based learning). The 8-item preference teaching method scale was designed to let the lecturer to rate the preference use on the 6 type of specific teaching method. As the number of items in the 6 types of specific teaching method subscales differed, this study used mean score to represent the 6 types of teaching method.
The content validity of both scales was verified by professionals in related field. The internal consistency of Cronbach's Alpha was also in acceptable level for both scales, which is 0.704 for general teaching practice scale, 0.868 for specific teaching method scale, and 0.715 for preference teaching method scale.

6. Result

Table 2 shows the mean and standard deviation of general teaching practice (GTP) among lecturers across gender, field, qualification and designation. From this descriptive data, female was reported a higher score than male. Lecturers with Doctoral degree got higher score than Master holders. And social science lectures scored highest, followed by science and technology, and engineering. The senior lecturers reported a slightly higher score than Associate professors & Professors, while the lecturer got the lowest score.

Table 2: Mean and Standard deviation of general teaching practice across gender, field, qualification and designation.

independent factors		Mean	Std. Deviation	N
gender	male	30.61	4.29	166
	female	31.57	4.79	191
field	engineering	30.00	4.42	102
	science and technology	31.19	4.81	134
	Social science	32.00	4.28	121
qualification	Master	30.70	4.65	94
	Doctor	31.25	4.56	261
designation	Lecturer	30.04	4.49	85
	Senior Lecturer	31.56	4.89	180
	Associate Professor & Professor	31.23	3.88	91
Total		31.11	4.58	356

As shown in table 3, the result of ANOVA test indicated that the significant main effect on the general teaching practice (GTP) was only found in lecture's field (engineering: B=-2.23, t=-3.59, p=0.005; science and technology: B=-0.68, t=-1.21, p=0.23) and teaching experience (B=0.074, t=2.125, p=0.034) , not in lecture's gender, qualification, or designation. It means that lectures in the field of engineering reported significantly lower level of GTP than the social science, but lectures in the field of science and technology did not differ with social science. Lectures with more years of teaching experience reported higher level of GTP.

Table 3: ANOVA test for the effect of field, gender, qualification, designation and teaching experience on general teaching practice (GTP)

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Intercept	Hypothesis	42655.09	1	42655.09	2037.00	0.00	1.00
	Error	130.60	6.236	20.944[b]			
experience	Hypothesis	88.69	1	88.69	4.51	0.03	0.01
	Error	6679.76	340	19.646[c]			
field	Hypothesis	259.83	2	129.91	6.61	0.00	0.04
	Error	6679.76	340	19.646[c]			
designation	Hypothesis	70.60	2	35.30	1.80	0.17	0.01
	Error	6679.76	340	19.646[c]			
qualification	Hypothesis	2.54	1	2.54	0.13	0.72	0.00
	Error	6679.76	340	19.646[c]			
gender	Hypothesis	44.54	1	44.54	2.27	0.13	0.01
	Error	6679.76	340	19.646[c]			

MANOVA was applied to examine the current teaching methods used among lectures in three fields. The result was shown in table 4. There was significant difference in teaching methods (TP) among lecturers in different fields (F=4.20, P=0.00). The result of tests of between-subject effects showed that the significant difference were mainly from three teaching methods (lecture: F=8.52, P=0.04; demonstration: F=3.31, P=0.038; problem solving: F=6.62, P=0.002). The other three teaching methods did not show significant difference between lectures in three fields.

Table 4: MANOVA tests for group differences in level of teaching method

dependent variable	field	Mean	SD	Multivariate Tests		Tests of Between-subjects Effects	
				Pillai's trace (F)	P	F	P
				4.20	0.00		
lecture	engineering	3.81	0.55			8.52	0.00
	science and technology	4.06	0.56				
	social science	3.79	0.59				
demonstration	engineering	3.76	0.71			3.31	0.038
	science and technology	3.88	0.64				
	social science	3.65	0.75				
discussion	engineering	3.88	0.73			2.81	0.062
	science and technology	3.98	0.70				
	social science	4.10	0.66				
co-operative	engineering	3.37	0.76			0.46	0.63
	science and technology	3.42	0.73				
	social science	3.46	0.62				
problem-solving	engineering	3.43	0.77			6.62	0.002
	science and technology	3.66	0.82				
	social science	3.30	0.83				
inquiry-based learning	engineering	3.60	0.70			0.67	0.51
	science and technology	3.69	0.63				
	social science	3.60	0.71				

The followed up post hoc test using LSD method was conducted to show in what way the lecturers from different fields differ. The result was shown in table 5, which only appeared the teaching methods with significant effect (lecture, demonstration and problem-solving). Both lecture and problem-solving methods were significantly frequently used by lecturers from science and technology. Lecturers from engineering and social science fields applied lecture method in a similar level; while lecturers from science and technology field used demonstration significantly more frequently than lecturers from social science field.

Table 5: Multiple Comparison using LSD method

Dependent Variable	(I) field	(J) field	Mean Difference (I-J)	Std. Error	Sig.
lecture	engineering	science and technology	-.2527*	0.08	0.00
		social science	0.02	0.08	0.82
	science and technology	engineering	.2527*	0.08	0.00
		social science	.2702*	0.07	0.00
	social science	engineering	-0.02	0.08	0.82
		science and technology	-.2702*	0.07	0.00
demonstration	engineering	science and technology	-0.11	0.09	0.23
		social science	0.12	0.09	0.22
	science and technology	engineering	0.11	0.09	0.23
		social science	.2252*	0.09	0.01
	social science	engineering	-0.12	0.09	0.22
		science and technology	-.2252*	0.09	0.01
Problem-solving	engineering	science and technology	-.2271*	0.11	0.03
		social science	0.14	0.11	0.21
	science and technology	engineering	.2271*	0.11	0.03
		social science	.3642*	0.10	0.00
	social science	engineering	-0.14	0.11	0.21
		science and technology	-.3642*	0.10	0.00

As shown in table 6, discussion was most frequently used by lecturers in UTM, followed by lecture, demonstration, inquiry-based learning, problem-solving and cooperative. A repeated measures using ANOVA with a Huynh-Feldt correction determined that the frequency in methods use differed significantly between teaching methods (F=14.69, P=0.00). Post hoc tests using the Bonferroni correction revealed that discussion was

statistically significantly more frequently used compared with demonstration (P=0.00), cooperative (P=0.00), problem-solving (P=0.00), inquiry based learning(P=0.00), but not with lecture (P=0.519).

Table 6. Repeated-Measure ANOVA for specific teaching method subscales

			Tests of Within-Subjects Effects	
	Mean	SD	Huynh-Feldt (F)	P
specific teaching method (STM)			60.19	0.00
lecture	3.90	0.59		
demonstration	3.77	0.70		
discussion	3.99	0.70		
cooperative	3.42	0.70		
problem-solving	3.47	0.82		
inquiry-based learning	3.54	0.84		

Lecturers were asked to rate the degree of their preference on the six specific teaching method, discussion was rated in the highest level of preference, followed by problem-solving, cooperative, inquiry-based learning, demonstration and lecture (Table 7). The result of repeated measure ANOVA showed that there was significant difference on lecturers' preference use of six teaching method. Post hoc tests using the Bonferroni correction indicated that lecture was rated significantly lower level of preference than other five teaching method (P=0.00). While both discussion and problem-solving were rated significantly higher than the other four teaching method (P=0.00).

Table 7. Repeated-Measure ANOVA for preference teaching method subscales

			Tests of Within-Subjects Effects	
	Mean	SD	Huynh-Feldt (F)	P
preference teaching method (PTM)			44.98	0.00
lecture	3.48	1.06		
demonstration	3.86	0.80		
discussion	4.24	0.75		
cooperative	3.97	0.90		
problem-solving	4.16	0.78		
inquiry-based learning	3.91	0.77		

7. Discussion

Previous research found that the lecturers from different field applied the teaching method differently, such as hard disciplines and soft disciplines, pure hard sciences (such as chemistry), pure soft (such as history), applied soft sciences (such as education) and applied hard sciences (such as medicine) (Lueddeke, 2003; Lindblom- Yla¨ nne, Trigwell, Nevgi & Ashwin, 2004). Consistently, this study found that lecturers from science and technology and social science applied more teaching skills, lecturers with more years of teaching experience applied more teaching skills and methods than those younger lecturers. Lecturers use different teaching method when the discipline and learning tasks vary (Morrison, Ross & Kemp, 2001). This study discovered that lecturers from different fields applied differently on some specific teaching method such as lecture, demonstration and problem solving, not on discussion, cooperative and inquiry-based learning. It further indicated that lecture from science and technology used more frequently on lecture and problem solving method than those from engineering or social science. Lecture as the traditional teaching method is remain used widely in higher education, which is an effective method to teach in a large group of students (Horgan, 2003); while problem solving is usually applied in a small group of students by using problem-based learning (Fry, Ketteridge & Marshall, 2003). The high rate of using these two specific teaching methods in science and technology implied that both passive learning and initiative learning are necessary due to the learning task and condition.

Although the traditional lecture was criticized on its passive learning (Horgan, 2003), its important role and contribution in higher education development could not be denied, as it is cost-effective and a useful tool to teach a large group of students (Fry, Ketteridge, Marshall, 2003; Horgan, 2003). This study also showed that lecture is one of the most frequently used in the teaching practice, that is much higher than demonstration, cooperative, problem solving, inquiry-based learning. Another finding is that discussion was rated as the first frequently used teaching method. Although lecture is effective to transmit information and knowledge (Saroyan, 2000), it is not helpful for higher-order thinking and deeper understanding (Morrison, Ross & Kemp, 2001). Students could frequently forget most of the material presented during a typical 50-minute of lecture (Horgan, 2003). To get the effective learning, the more interactive methods are required such as discussion, cooperative. Currently, lecturers would like to introduce various effective and evidence-based teaching methods (e.g. discussion, inquiry-based learning) in the traditional lecture, which could develop initiative learning and higher-

order thinking (De Corte, 2000).

For the preference of six teaching methods, this study found that those lecture rated discussion as their favorite teaching method which was also frequently used in teaching practice; while lecture was rated in a lowest level of preference among six teaching method which was actually frequently used in teaching practice. This distance between teaching practice and lecturer's preference implied that the perspectives of lecturers in UTM have changed and moving towards more interactive teaching methods. But they still chose the lecture method frequently may be constrained by the teaching condition, number of students.

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