Lecturer's Teaching Styles Versus Student's Learning Styles - A Pilot Study

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ABSTRACT

The purpose of this study is to investigate whether lecturer's teaching style complies with the student's learning style. A set of questionnaire based on Felder's four domains of Learning Style, namely, active-reflective, sensing-intuitive, visual-verbal and sequential-global was designed for data collection. The data were analysed using Microsoft Excel. The results show that the lecturers' teaching styles match the students' learning styles in three domains that are active-reflective, visual-verbal and sequential-global but not in sensing-intuitive domain.

Keywords: *learning styles, active, sensing, visual, sequential*

Introduction

Researchers and educators have asserted that students have different ways of learning as they have different ways perceiving and processing information. Some learn by seeing and hearing, some by memorising and visualising. Similarly, there are many teaching methods – some lecturers lecture, some discuss, and some demonstrate. It is wise for the lecturers to be aware and understand what learning styles preferences are. It is important that lecturers know there are diverse learning styles in the students population when preparing materials for the students. Since there are different styles of teaching and learning, we believe that serious mismatch may lead students to be bored in class, inattentive, do poorly at tests, become discourage and give up, unresponsive, poor attendance and high rate of failure.

The objective of this paper is to investigate which teaching styles are most favoured by lecturers in the Mathematics Department in UiTM Pahang. Our discussion concentrates on how far the lecturers' teaching styles in the Mathematics Department match the students' learning styles. The results of students' learning style used were obtained from our previous study. We also hope that we can propose on what can be done to enhance the teaching of mathematics and to address the educational needs of majority of the students who are taking up mathematics course.

Matching Teaching to Learning Style – An Overview

The issue of matching teaching styles to learning styles appears to be much controversial and debatable. There are findings which support the idea of matching and those that do not. Coffield et al. (2004) cited the results of two researchers who discovered that for every nine studies showing learning is more effective when there is a match, and on the other hand, there are nine showing learning is more effective when there is a mismatch.

Support for matching teaching styles and learning styles comes from a number of studies. Some researchers assert that students learn more when there is a match between students learning styles and lecturers teaching style. Research have shown that learning improves when lecturers match their teaching to students' learning styles (Matthews, 1991; Searson & Dunn, 2001; O'Connor, 2006). Students, whose learning styles were compatible with lecturers' instruction, retained information longer, could apply it more effectively, and had more positive outlook towards the course compared to those where mismatching was apparent (Felder,1993).

However, other researchers who are in favour of not matching teaching styles with learning styles argue that the effects of learning styles accommodation are inconclusive and insignificant (Curry, 1990; Ching-Sue, 2005; Ebeling, 2000). Another reason given is that matching teaching and learning styles is simply unrealistic – lecturers changing their teaching style to accommodate more than twenty styles in one classroom, the overwhelming problems of coming up with instructional materials to accommodate the variations of learning styles and finally, the question of where would they stop in the pursuit of diversity, as asked by Doyle & Rutherford (2003).

Thus, the fundamental question now is "to match or not to match?". Taking into account the educational, developmental stages of our students, and their achievement in mathematics courses offered by the UiTM, we decided to be in favour of the accommodation of the teaching styles. Educators from the Learning Assistance Center at the College of San Francisco claim that matching individual learning styles can improve attitudes towards learning and improvements in academic performance ("Learning styles", 2006). Similarly, Charkins et al. (1985) asserts that matching teaching styles and learning styles is likely to improve both students' attitude towards learning and academic achievement. Students with less sophisticated learning skills learn more effectively and experience better learning when they are taught according to their learning styles (Matthews, 1991).

Methods of Study

In this study, we designed the questionnaire and use it as data collection instrument. The questionnaire was based on Felder's four domains of Learning Style which were active-reflective, sensing-intuitive, visual-verbal and sequential-global. The questionnaire consists of 17 questions and the respondents need to answer according to 1 - 5 Likert's Scale. It contains questions on each of the four domains. Twenty two lecturers ranging from one to twenty years of teaching experience were the respondents of this study.

To determine the learning styles preferences of the students, 110 students responded to a learning style inventory developed by Felder (1988). The index of learning styles (ILS) is an instrument used to define learning preferences on the four dimensions of the Felder-Silverman learning style model i.e. active-reflective, sensing-intuitive, visual-verbal and sequential-global. However, the weaknesses of this study, according to Felder (1995), are whether the dimensions are fully independent is not proven yet and most preferred teaching style may not correspond to the ability of learning effectively.

Result and Discussion

Respondents who answered above three (3) were considered to have a strong preference in that particular teaching style. The descriptive results of teaching style are as shown in Table 1. From this table, we can say that 90.9% (highest percentage) of mathematics and statistics lecturers

teaching style is active teaching. On the other hand, only 18.2% (lowest percentage) of the lecturer agree that they are strong in the verbal domain.

Table 1. Preference of lecturers' teaching style

Domain	Percentage
Active	90.9
Reflective	77.3
Sensing	72.7
Intuitive	86.4
Visual	43.9
Verbal	18.2
Sequential	79.5
Global	52.3

What are the factors contributing to the inadequacy in the verbal domain? Is it difficult for mathematics lecturers to look deeply at the diagram for visual information and talk about it simultaneously? In the issue of the independence of auditory and visual domain, Mehta & Newcombe (1996) suggested the possibility of such likelihood. Or could it be that the diagram speaks for itself that no verbal explanation is needed? As lecturers, they are able to 'see' the mathematical concepts or processes being represented. However, students do not have this 'experienced eyes', so lecturers need to do some explaining to help students with the underlying mathematical ideas.

From Table 2, we can say that the lecturers match the students learning style except in the sensing-intuitive domain. 54.3% of the lecturers in mathematics department prefer intuitive teaching style whereas only 35.4% of our students are intuitors. This finding is similar to what has been found by Felder (1988) who claimed that most of engineering professors at North Carolina State University are themselves intuitors.

Table 2. Comparison between lecturers' teaching style and students' learning styles

Domain	Percentage over domain (Lecturer)	Percentage over domain (Students)	Match?	Percentage difference
Active	54.1	67.2	Yes	13.1
Reflective	45.9	32.9		-13
Sensing	45.7	64.7	No	19
Intuitive	54.3	35.4		-18.9
Visual	70.7	93.8	Yes	23.1
Verbal	29.3	9.2		-20.1
Sequential	60.3	74.5	Yes	14.2
Global	39.7	25.5		-14.2

Another finding that captures our attention is the highest percentage difference (23.1%) in visual teaching and learning style. This percentage difference shows that the expectation of some of the students in visual teaching is not met. To make abstract concepts understandable to students, the use of visual representations such as diagram has proven to be quite effective. Problem solving performance of fifth grade students improved significantly with the aid of visual aid (Moses, 1982). Concrete-pictorial imagery plays a role in motivating students, facilitating them to clarify the problems (Campbell et al., 1995).

A study conducted by Nooriafshar & Maraseni (2004) on two groups of students (undergraduate students in University of Southern Queensland and Apex College, Kathmandu, Nepal) shows that students prefer to learn the concepts first before finding out the application. From the present study, we find that 86.4% of lectures in mathematics department strongly agree that they need to teach the concept first before the application.

Here we proposed a few teaching techniques in Mathematics in order to make the process of teaching and learning become more effective:

1. Try to relate whatever materials that have been discussed in previous class to what is still to come and relate to other courses if possible (Active). For example if we know the topic discussed has an application in Physic, Engineering, Biology or History then we should mention this in class. This will somehow motivate them to learn more about mathematics since all this while they may look mathematics and history as two totally different courses (Inductive/ global).
2. Always look for possible improvement in your teaching even you have been teaching the same course for more than 3 years (Active). Read articles in educational journals, go to conferences and visit digital library because things are always happening and there are possibilities of new finding and development in the course that you are teaching.
3. Teach with clear learning objectives (Global). Most likely the students can easily meet the objectives if the lecturer states the objectives of the course clearer because they know the lecturer's expectations.
4. Use diagrams, graphs or simple sketches before, during and after verbal explanation (visual) but do not turn the class into Power Points show (Felder & Brent, 2008). Try to provide variety in class.
5. Have a question and answer session, giving students time to think before answering the question (Reflective). Do not use all the time lecturing or writing on the board. Mathematical tasks such as solving problems in class can somehow break the monotony of a continuous lecture.
6. Emphasizes fundamental understanding on basic concept, practical problem-solving methods and drill exercises. (Active/ sequential).
7. Give group assignment to encourage students do discussion among them (Active). The lecturer must stress on individual accountability which means each member of the group must be accountable for the whole assignment, not only part of it. Mathematics lecturers need to pose worthwhile mathematical tasks, use cooperative learning groups, and use models as thinking tools. (Van de Walle, 2001).
8. Give quizzes and tests and individual assignment (Intuitive). Give students at least three times longer than what you needed to answer the same question.
9. Talk to students about learning style and study method to motivate them (All types). Lecturer should be aware that students have different learning styles and different cognitive levels.

Conclusion

Having students with different learning styles does not mean that we need to teach students exclusively according to his/ her learning style. The best way is to use balances method of teaching style. In this paper, we suggest a few techniques of teaching but the lecturers need not to use all the techniques at once but pick several, keep the one that work and drop the others. Try a few more in the next course so that the process or teaching becomes more effective for the benefit of our students and organisation. Something needs to be done to decrease the percentage difference between visual teaching style and visual learning style, such as the use of visual aids as suggested by Nooriafshar & Maraseni's (2004).

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