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MATCHING TEACHING STYLES AND LEARNING STYLES: WHAT HAPPENS IN THE CASE OF A MISMATCH?

Lee Mei Ph'ng, Thang Siew Ming, Radha M. K. Nambiar

ABSTRACT

It has been acknowledged that teacher and student diversity in the classroom have led to varied teaching and learning styles preferences. Previous studies have generally looked at teaching styles or learning styles in isolation and have rarely considered the impact of teaching styles on learning styles or vice versa. This study extends this one step further by first establishing the learning styles of a group of engineering students and then investigating the impact of the teaching styles of their Technical Communication teacher on them in an English for Specific Purposes (ESP) context. Specifically it explores whether accommodation or resistance arises when there is a mismatch in teaching and learning styles. The respondents were 5 Malaysian engineering undergraduates from two engineering faculties of a public university. Data from students were collected using Felder and Silverman's Index of Learning Styles (ILS) questionnaire, student interviews and reflective journals. Teaching styles of the teacher were identified using Grasha and Reichmann's Teaching Style Survey. The findings revealed that the students and the teacher have mixed learning styles and teaching styles preferences respectively. In addition, the teachers' teaching styles generally have a positive impact on the students but there were occasions when these were not so. These findings will be discussed in greater detail in this paper.

Keywords : Teaching styles; learning styles; engineering education; perception of students; case study

INTRODUCTION

Student and teacher diversities in the classroom indicate the presence of variation in both learning style and teaching styles. Learning styles generally refers to the way someone prefers to obtain and manage ideas while teaching styles refers to the teachers' beliefs and chosen instructional methods. Thus, understanding the characteristics and strengths of each learning style and teaching style can be used to further enhance students' learning experiences in the classroom. Mills, Ayre, Hands and Carden (2005) agree with previous studies which reported positive results in student outcomes and a reduction in attrition rate when teaching styles were adapted to suit students' learning styles. As a result faculty awareness was also raised. As Sarjit Kaur and Malini Ganapathy (2008) pointed out, it is vital to improve the quality of teaching and

learning to improve the quality of graduates. However, before strategies can be developed to help students cope in a particular subject or course, it is necessary to examine students' perceptions of their learning experiences. Examination of students' perceptions allows teachers to reflect on their teaching styles (McDowell, Penlington and Tudor 2010) and adopt strategies to enhance their teaching. Of particular interest in this study were the students' perceptions of the teaching and learning processes in their Technical Communication classroom particularly with regard to how they perceived their teacher's teaching styles in relation to their own learning styles. This is because matches and mismatches between learning styles and teaching styles have been reported to affect student motivation and achievement.

There are various learning styles models and a few of the popular ones include Kolb, Canfield, Felder-Silverman, Grasha-Reichmann, Myers-Briggs Type Indicator (MBTI) and Dunn and Dunn. The current study uses Felder and Silverman's model to characterize the students. It is chosen because it is developed for engineering students (Felder and Silverman 1988; Felder and Spurlin 2005). Learners are categorized according to eight learning styles preferences on four learning styles dimensions. Learners are categorized as active, reflective, sensing, intuitive, visual, verbal, sequential or global learners. Active learners learn as they do and reflective learners learn as they think alone. Visual learners learn through diagrams and verbal learners learn via listening or reading. Sensing learners are inclined towards facts and application of knowledge while intuitive learners are inclined towards learning theories and abstract ideas. Sequential learners prefer to learn step-by-step while global learners prefer to make the connections themselves.

The teacher's teaching style preferences in this study is characterized according to Grasha-Reichmann's teaching styles model. This teaching style model is adopted for this study because it is based on the thematic analysis of the teaching styles in the college classroom (Grasha 2002). Educators are categorized according to five teaching styles preferences namely the formal authority, facilitator, expert, personal model and delegator teaching styles. Teachers who prefer the formal authority teaching style generally focus on the proper way of doing things while teachers who favor the facilitator teaching style attempt to foster teacher-student interaction and the overall goal of helping students become independent in their learning. Teachers who have preference for the expert teaching style, on the other hand, are concerned with conveying information to prepare students. Teachers who favor the personal model teaching style encourage students to follow their examples while teachers who favor the delegator teaching style guide students towards achieving autonomy in their learning.

RESEARCH QUESTIONS

This study seeks to examine the impact of the teacher's teaching styles on the students' learning experiences by answering the following questions:

- a. What are the preferred learning styles preferences of UTeM engineering undergraduates?
- b. What are the preferred teaching styles preferences of their Technical Communication teacher?
- c. To what extent are these students willing to accommodate to their teacher's teaching styles preferences?

METHODOLOGY

Subjects and Setting

The sample for this study was 5 UTeM engineering undergraduates who have taken the Technical Communication subject and their teacher Madam A. The students were from two engineering faculties in UTeM namely the Faculty of Electrical Engineering and the Faculty of Electronics and Computer Engineering. Four of them were male students. S3 and S5 were third year students while the other three students were second year students. Madam A has seven years' experience in teaching the Technical Communication subjects. All of them were invited to take part in the study and the students were not penalized should they decide to withdraw from the study.

The Research Instruments

The Index of Learning Styles (ILS) by Felder and Solomon was used to identify the LS preferences of the students as it was designed with engineering students in mind and various studies have discussed its reliability and validity (Felder and Spurlin 2005; Zywno 2003). It contains 44 items and respondents are required to choose between two options for each question (for example "I understand something better after I (a) try it out (b) think about it in detail"). The ILS was adapted to suit the context of this study. For example, item 6 was revised from "If I were a teacher, I would rather teach a course..." to "If I were a teacher, I would rather teach a course...". This was done to assure that the items are related to the students' learning experience in the university.

The Teaching Style Survey (TSS) by Grasha and Riechmann, on the other hand, classifies educators as having preference for the formal authority, facilitator, expert, personal model or delegator teaching styles. It was deemed as suitable for this study as it was developed on a model that was derived from the thematic analysis of the universal TS found in college education (Grasha 2002). The TSS contains 40 items and respondents choose from a five-point Likert scale ranging from 1=strongly disagree to 5=strongly agree.

Individual, semi-structured interview ranging between 30-45 minutes long was conducted on each of the five students. This type of interview was chosen as it enable the researcher to elicit more in depth information (Wiersma and Jurs 2005; Berg 2004) than a questionnaire. Before the interviews were audiotaped, students and the teachers were asked to sign a form giving permission to the researcher to use the data for research purposes. In the form it was stated that the teacher's and the students' identities would not be revealed in the research. The questions firstly required the students to talk about the courses they were taking and aspects they liked and disliked about it. They were also asked to share their perceptions about their Technical Communication teacher's TS preferences and their experiences in learning the Technical Communication subject. In addition to that, the students had to write a reflection of what they thought of their Technical Communication teacher's TS preferences. Unlike the student interviews, prompts were not provided so that the students could express their opinions freely.

Data Collection Procedure

The students who took part in the research study were contacted via email and SMS. They were informed of the objective of the study and were assured of anonymity in whatever tasks they had to undertake for the study. The students were told they would have to answer a questionnaire (i.e. the ILS), participate in an interview and write a reflection of the Technical Communication teacher. The interviews were conducted on campus in between their classes. Students were allowed to speak in English or Malay, depending on their preferences. This part of the study was conducted towards the end of the 2010/2011 academic session. The reflection was administered to the students at the beginning of the following semester as students were too busy with their assignments or projects at the end of the 2010/2011 academic session to undertake this task. Some of them wrote their reflections in Malay while some wrote in English. This did not affect the data analysis process as the researcher could translate the journal entries in Malay into English. An independent evaluator who has a translation qualification was invited to check the translation.

Data Analysis

The ILS and TSS data were analysed manually due to the small number of respondents. The student interviews were transcribed in verbatim. The interview data and reflections were matched against the students' preferred learning styles and their teacher's preferred teaching styles as indicated in the ILS to see whether there are similarities and differences between what they had stated in the ILS and what they expressed in the interviews and reflections. Emphasis was given on how the students perceived the teaching styles of their Technical Communication teacher. The data were also examined for the presence of matches and mismatches between students' learning styles and Madam A's teaching styles and instances of accommodation of their teacher's teaching styles.

FINDINGS

Table 1 below shows that the students do have diverse learning styles (LS) preferences. S1, S3 and S5 appear to have more distinct LS preferences while S2 and S4 appear to incline towards balanced LS preferences. Madam A, the teacher is moderate in her teaching styles (TS) preferences. She indicates a moderate preference for the facilitator, formal authority, expert and delegator TS and a low preference for the personal model TS.

Table 1: Students' learning styles preferences

Student	Learning styles preferences
S1	Moderate active, strong visual, balanced for sensing-intuitive and sequential-global LS
S2	Balanced for all LS
S3	Moderate reflective, moderate sensing, balanced for visual-verbal and sequential-global LS
S4	Balanced for all LS
S5	Moderate reflective, moderate intuitive, moderate global, balanced for visual-verbal LS

A key focus of this study is that the students' perception of Madam A's TS. The data reveal moderate or balanced LS preferences in the students and Madam A, which suggests that there should be a minimal mismatch between Madam A's TS and her students' LS preferences. However, data analysis reveal that this is not necessary so. Analysis reveals students' expresses their opinions regarding Madam A's formal authority, facilitator and expert TS and do not give any opinion regarding her "moderate delegator" and "low personal model" TS. However, this does not mean an absence of these TS as the data are based on what the students could recollect which most probably would be experiences that created the strongest impression among them.

In interpreting the data, the general rule used is that if a student's LS preference is under the balanced category then it is assumed that the student is not partial or inclined to either of the learning styles and he/she is willing to accommodate/accept either of them. For example if a student shows a preference for a balanced sequential-global learning style that is interpreted as willingness to accommodate/accept either the sequential or global learning style.

Table 2 below shows that the students have positive perceptions of Madam A's formal authority TS regardless of whether this TS matched or mismatched the students' LS preferences. According to the students, Madam A would insist on a very rigid procedure with regard to submission of assignments. This is a teaching style that sequential learners would prefer. For example, her students had to submit a draft for her approval before they could submit their reports. S2 and S4 found this procedure beneficial as it had helped them to improve their reports. This would be considered as a match in teaching and learning styles as these students have a preference for the balanced sequential-global LS dimension.

Similarly, S1 found it helpful when Madam A shared her expectations of the coursework by giving detailed explanations of what she expected from her students. This matched S1's preference for balanced sequential-global LS. He shared

"when explain something like assignment, she will explain what she needed for assignment step by step and very clear. This is the good thing that must be apply by all the teacher".

The data also indicate that the students could perceive her formal authority TS positively although it did not necessary match their LS. For example S5 (global learner) found Madam A's feedback on her draft helpful. This is something a sequential learner would prefer however S5 (a moderate global learner) had no problem with this. She said:

“proposal...let her check. Fix the title. Teacher can give opinion on things to be included in report and suggest other extra resources like websites.”

Table 2: Madam A's Formal Authority Teaching Style (TS)

Madam A's Formal Authority TS	Student	LS Preference	Match or mismatch?	Students' perceptions
Rigid procedure regarding submission of assignment	S2	Balanced	Match	Positive
	S4	Balanced	Match	Positive
	S5	Global	Mismatch	Positive

Table 3 shows the students' mixed perceptions of Madam A's moderate facilitator TS, particularly her emphasis on creating two-way communication which would match the LS of the active learners. For example, S5 enjoyed the two-way interaction in the Technical Communication classroom although she has a moderate preference for the reflective LS. She said

“lecture session were excited because we shared our opinions with the teacher and also in group discussion...can brainstorm”.

In contrast, S2, S3 and S4 commented that there should have been more interaction in the classroom. This matches S2 and S4's preferences for the balanced active-reflective LS but does not match S3's moderate preference for the reflective LS. It evidently matches the LS of S1 (a moderate active learner). He even suggested that there should have been activities related to Technical Communication and teachers should share through a Facebook.

Table 3: Madam A's Facilitator TS: Two way communication

Madam A's Facilitator TS	Student	LS Preference	Match or mismatch?	Students' perceptions
Two-way communication	S1	Active	Match	Negative
	S4	Balanced	Match	Negative
	S5	Reflective	Mismatch	Positive
	S3	Reflective	Mismatch	Negative
	S2	Balanced	Match	Negative

As shown in Table 4, Madam A also shared her experiences with the students as a mean of creating a closer relationship with her students. This would be more appropriate for students who prefer the sensing LS such as S1 who said:

“sometimes she will share her experiences with us and that provide us more knowledge to face the outside world after graduate. This knowledge is very useful to us.” He added *“because all of us can work already. So they also want to know how our life out there. So maybe a teacher can share some experience with them. They will be more happy like more enjoying”*.

Table 4: Madam A’s Facilitator TS: Sharing of experiences

Madam A’s Facilitator TS	Student	LS Preference	Match or mismatch?	Students’ perceptions
Sharing of experiences	S3	Sensing	Match	Not entirely positive
	S1	Balanced	Match	Positive
	S5	Intuitive	Mismatch	Positive

However, S3 (a moderate sensing learner) found some of her stories boring whereas S5 (a moderate intuitive learner) found it useful.

Madam A also gave the students space to explore by allowing them the freedom to choose their own the topics for their assignments. This was perceived positively by S1, S2, S3 and S4 as it they could relate their interest to their assignments which matched S3’s moderate preference for the sensing LS (application of knowledge) and S1, S2 and S4’s balanced preferences for the sensing-intuitive learning style dimension as demonstrated in Table 5. As expressed by S3:

“doesn’t put restrain on assignments. Putting barrier on students’ imagination is like educating them in a way to make them to become what you want the students to become instead of letting them to be what they are meant to be”.

Table 5: Madam A’s Facilitator TS: Freedom for students to choose topic

Madam A’s Facilitator TS	Student	LS Preference	Match or mismatch?	Students’ perceptions
Freedom to choose topic	S1	Balanced	Match	Positive
	S2	Balanced	Match	Positive
	S3	Sensing	Match	Positive
	S4	Balanced	Match	Positive

Table 6 shows the students’ generally positive responses to Madam A’s moderate expert TS. S3 described Madam A as knowledgeable and that her lessons were not limited to the content of the textbook. This matches his preference for the sensing learning style and he is happy with

that.S1 (a balanced sensing-intuitive learner), however, felt that Madam A had not given enough emphasis on the application aspect of the Technical Communication subject. . He said

“I think after we learn it, it will be better if there is more on the practical. Practical things. For me lah. I more enjoy the practical thing because most of them is the engineering students right so they are more prefer practical things.”

Table 6: Madam A’s Expert TS

Madam A’s Expert TS	Student	LS Preference	Match or mismatch?	Students’ perceptions
Knowledgeable	S3	Sensing	Match	Positive
Application aspect of knowledge	S1	Sensing	Match	Not entirely positive

As shown in Table 7, the students found Madam A’s use of exercises, articles, examples and preparation for exam as helpful in aiding their understanding of the lessons. However, S1 and S3 did comment that there should have been more activities while S2 requested for more examples. As for S2 and S4, they felt that handouts containing extra notes could have been given to the students.S2 added that he found it helpful when Madam A prepared the students for the exam and this is consistent with his balanced preference for the sensing-intuitive LS.

Table 7: Madam A’s Expert TS: Teaching Activities

Madam A’s Expert TS	Student	LS Preference	Match or mismatch?	Students’ perceptions
Activities (exercises, articles, examples, handouts)				
	S4	Balanced	Match	Positive
	S1	Balanced	Match	Positive/Negative
	S2	Balanced	Match	Positive/Negative
Prepares them for exam	S3	Sensing	Match	Positive/Negative
	S2	Balanced	Match	Positive

DISCUSSION AND CONCLUSION

The findings reveal instances of matches between Madam A’s TS and the students’ LS. In addition, it shows that in many cases the students have positive perceptions of her TS although mismatches occurred. The findings of this study seem to suggest that students are generally willing to accommodate their teacher’s TS when a mismatch occurs. Thus, contrary to Poon’s study (2000), the students in this study did not necessarily suffer when there is a mismatch. However, this does not mean that educators should be complacent and assume this will always

be the case as there is still the possibility of resistance. Instead, it is more important for teachers to acknowledge student and teacher diversity in their classrooms and adopt appropriate instructional strategies. For example, active learners should be given the opportunity to work with others while reflective learners should be given opportunity to work alone. Sensing learners, on the other hand, should be given the opportunity to apply the knowledge they have learned. A clear limitation of this study is that the students are balanced or moderate in almost all their preferences and the teacher concerned is moderate in her teaching styles, hence there is no distinct contrast in learning styles and teaching styles. So for further research, a more diversified group of students and teachers and a larger sample size should be chosen which may possibly lead to the emergence of clearer and more distinct patterns that will lead to more insightful interpretation that have greater and wider implications.

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Lee Mei Ph'ng, Thang Siew Ming, Radha M. K. Nambiar

Universiti Kebangsaan Malaysia (National University of Malaysia),
School of Language Studies and Linguistics,
Faculty of Social Sciences and Humanities,
43600 Bangi, Selangor, Malaysia