

METHODS OF TEACHING AND GOALS OF TEACHING: TEACHING STYLES OF TEACHERS IN HIGHER INSTITUTIONS

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Abstract

The objective of this study was to determine the teaching styles of teachers in higher institutions. One hundred and forty lecturers in one university were recruited as participants for the study. A teaching style inventory developed by the Centre for Occupational Research and Development was used to determine the teaching style of the individual lecturers. The teaching style is made up of two dimensions, the goal of teaching and the method of teaching. The results indicate that the cooperative-active teaching method is most preferred by the education and engineering lecturers; the cooperative-symbolic method is most preferred by the management lecturers and the individualized-enactive teaching method is preferred most by the information technology lecturers. On the teaching goal dimension, application and understanding are the most cited goals of teaching (preferred by 50% or more at all faculties) while rote and abstract learning is the least preferred teaching goal (preferred by less or equal to 10% at all faculties). In conclusion, teaching styles of teachers in higher institution may differ on the method of teaching dimension - depending on disciplines - but tend to be similar on the goal of teaching dimension.

Introduction

The changing characteristics of students entering higher institutions today have raised concerns about teaching in higher institutions. Conventional teaching approaches that have been successfully used in the past are no longer adequate for present day students. Being traditionally unprepared in the art and science of teaching - with the exception of the education teachers - teachers in higher institutions may not be able to adequately address the learning needs of their students. Thus, there has been increase concern over the effectiveness of teaching in higher institutions.

Teaching effectiveness has been associated with teaching style of the teacher. Teaching style refers to the teaching preferences of a teacher. Researchers are not in agreement on the operational definition of teaching style but they are in agreement that teaching style is something that concerns the process of teaching rather than the content of teaching (Neher, Gordon, Meyer and Steven, 1992). Irby (1995) refers to teaching style is the manner, method, or means by which teachers attempt to convey information and influence the understanding and behaviour of their learners. Intuitively, teaching style thus appears to be one of the major contributors to students learning i.e. the effectiveness of teaching. Learning theory also supports the idea that teaching style influences teaching effectiveness as suggested by the cognitive learning theory,

“...the way students are taught has a significant influence on the type of cognitive structures they create and the way they store and structure knowledge they acquire determines to a great extent how flexible they will be when they must use that knowledge.”

(Boger-Mehall, 2007, Para 2, line 5-7).

Empirically, matching and mismatching of teaching and learning styles was found to have direct and indirect effects on learning outcomes (Ford and Chen, 2001). However, the effects were observed were dependent on the maturity of learners. The need for matching teaching and learning style appear to be more prominent among developmental students compared to the highly motivated mature learners. Mismatch between teaching and learning among engineering students has led to poor students' performance according Felder and Silverman (1988). Matching teaching

and learning style on the other hand was found to improve engineering students' performance (Ayre1 and Nafalski, 2000). Spoon and Schell (1998) however, did not find any negative impact of mismatch between teaching and learning style among their mature students, enrolled in continuing education programmes whose mean age is 34.5 years old.

Matching and mismatching of styles may also have an indirect impact on learning outcomes. Shafie and Alias (2007) found that higher interests towards a subject matter are associated with matching between teaching and learning styles. This finding is similar the finding from a study by Ayre1 and Nafalski (2000) who found that students have better interest in a subject when the teaching style of the lecturer matches their styles. A mismatch between teaching and learning style on the other hand appear to be associated with poor interest towards the subject concerned (Shafie and Alias, 2007).

Based on studies conducted on Chinese, American and Hong Kong university students, Peacock (2002) found that students prefer teaching styles that are non-conforming (student-centred) which allow them to work collaboratively and to be creative in their learning. Spoon and Schell (1998) however find that, mature students do not necessarily favour the student-centred learning style all the time. Mature students in his studies prefer a teaching style that is alternating between teacher-centred and student-centred depending on the academic assignments involved. There is therefore, no one right teaching style for all learning situations. The right teaching style will be the style that is appropriate for the characteristics of the students, the learning content to be delivered and the learning objectives to be achieved.

Problem statement

Teaching style of teachers in higher institution is less known compared to teachers in secondary educations. The purpose of this study was therefore, to determine the teaching style of University lecturers. The specific research questions are

- i. What is the dominant teaching style of University teachers?
- ii. Is there an association between academic discipline and teaching style?
- iii. Is there an association between teaching experience and

Teaching style models

Two teaching style models are presented here, the Grasha integrated teaching and learning style model (Grasha, 2002) and the CORD teaching style model (CORD, 2005) to give some understanding on what researchers define as teaching style.

a. Grasha teaching style model

Grasha (2002) looks at teaching style from the perspective of the teaching approaches used whether student-centred or teacher-centred. According to him, a person's teaching style can be classified into formal authority, demonstrator, facilitator or delegator. The formal authority style is a teacher-centred style that discourages student-student and student teacher collaborations. The demonstrator style is also a teacher-centred style with a difference; it encourages students' participations in the teaching and learning process. The facilitator style on the other hand is a student-centred style that facilitates and encourages students to be responsible for their own learning achievements through teacher designed activities. The delegator teacher is also student-centered in their approaches giving much more control and responsibility for learning to students. Delegators often delegate works to students and such as expecting them to design and implement a complex learning project and will only provide feedback if consulted.

b. CORD teaching style model

CORD teaching style model looks at teaching from two perspectives, teaching approaches and teaching goal. The teaching goal is divided into learning, which is seen as being on the rote to understanding continuum, and concept representation, which is seen as being on the abstract to applied continuum. Similarly, teaching method is divided into cognitive processing which can vary on the enactive to symbolic continuum and interaction, which can vary on the individual to group work continuum. The graphical representation of CORD teaching style model is shown in Figure 1.

A person's teaching style can thus, be understood from their teaching goals as well as their teaching approach. An example of a teaching style is a style that emphasises applied representation of concepts and rote learning, using symbolic cognitive processing and individualised work, which means this teacher, prefers teaching that tie concepts to their applications in the real world, emphasising the importance of correct answers, explaining explicitly all the processes involved and places great emphasis on individual work. Although, the terms student-centred and teacher-centred are not mentioned in the elaboration of CORD teaching style model, teacher or student-centeredness is implicit and can sometimes be inferred from the descriptions of the style. The example just given can be reasonably inferred to be a teacher-centred style. An example of a student-centred style is the applied, understanding, enactive and cooperative style. A teacher with this style would tie up concepts to the real world applications, placing great importance on students' understandings through hands-on activities and collaborative work.

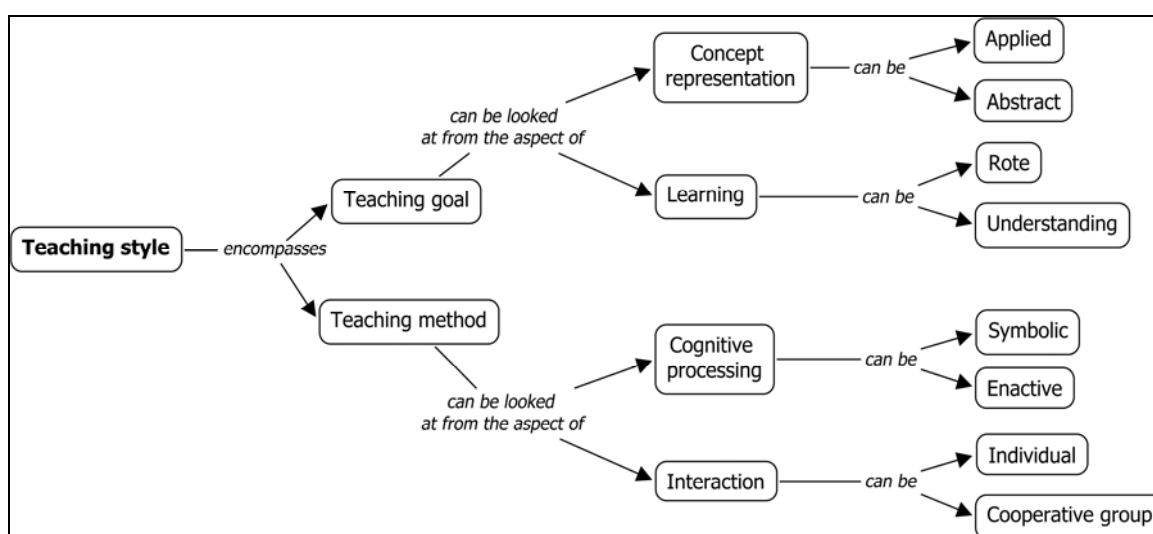


Figure 1 CORD Teaching style model

Although the CORD model is not as widely known as the Grasha model but it was used in this study as, it provides the opportunity to look at teachers' teaching goals and teaching methods simultaneously

Research on teachers' teaching styles

Studies on secondary school teachers indicate that secondary teachers' teaching styles were essentially similar across different subjects (Guinta, 1984). This could be due to the teachers using the existence of a "default teaching style" (especially for a new teacher), which is determined by their learning experience and the culture of the institution where they teach (Russell, 2000). In a University setting, it is expected that a lecturer from one academic discipline - with its established

teaching culture - will use the same teaching style irrespective of the subjects that he or she is teaching.

Genc and Ogan-Bekiroglu, (2004) found that teaching styles of science teachers are placed between teacher-student cooperation style and student-centred style. The evidence from the data indicates that teachers with higher degree in the field of education possess more student-centred teaching styles and that participation in professional activities (e.g., workshops, training) tend to make teachers favour more student-centred approaches. This indicates that a teacher's educational level may have an impact on their teaching style, being more student-centred with higher educational level and trainings. They also found that new teachers are more student-centred as compared to the long serving teachers. They attribute this phenomenon to the state of the art trainings that the new teachers are getting prior to their teaching profession.

In universities, Felder (1993) and Byrne (2007) found that teaching style of engineering educators tend to be incongruence with their students learning styles, leaning heavily towards a learning style that is intuitive, verbal, deductive and reflective in contrast to engineering students who are learning more towards active, sensory and visual learners (Byrne, 2007). Byrne, 2007 then propose that these teachers are actually using a style that they were comfortable as students.

Methodology

The study uses the survey design it provides the opportunity to gather information at one time on a large sample. The target population of this study is university lecturers teaching technical and vocational oriented subjects. The sample was 140 university lecturers from four technical oriented disciplines; engineering ($n=70$), technology management ($n=20$), technical education ($n=30$) and information technology ($n=20$).

The instrument used to assess teaching style was a teaching style inventory developed by the Centre for Occupational Research and Development (CORD). This inventory is designed specifically by CORD for assessing the suitability of teachers teaching style in implementing contextual teaching, a teaching approach widely accepted to be suitable for technical and career oriented discipline. The CORD teaching style inventory consists of two dimensions of teaching style namely, the teaching goal dimension and the teaching method dimension. The teaching goal dimension is further divided into learning, which is seen as being on the rote to understanding continuum, and concept representation, which is seen as being on the abstract to applied continuum. Similarly, the teaching method dimension is divided into, cognitive processing which can varies from enactive to symbolic and interaction, which can varies from individualised to group work. Sample items are shown in Table 1.

Table 1 Sample items on the CORD teaching style inventory

Teaching style dimension	Sub-dimension	Example of items: "During my teaching I..."	
Teaching goal	Delivery	Application	Tie concepts to applications in the real world
		Abstract	Allow students to develop their own problem solution process
	Learning	Rote learning	Amplify the importance of attaining the correct answer
		Understanding	Capitalize on students curiosity about unfamiliar situations
Teaching method	Interaction	Cooperative	Situate students in group when assigning worksheets
		Individual	Eliminate activities where the result is not distinctly attributable to individual students
	Cognitive process	Symbolic	Relate the method for solving a problem as explicitly as possible
		Enactive	Introduce manipulative or software, to permit students to represent concepts concretely

The teaching style matrix for teaching goal and teaching method is represented graphically in Figure 1 and Figure 2 and the interpretation of each matrix is given in Table 2.

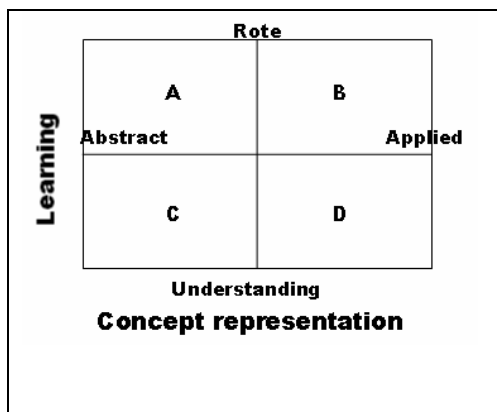


Figure 1 Teaching goal Matrix

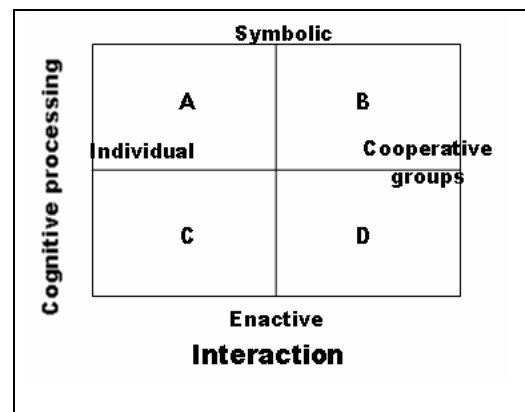


Figure 2 Teaching Method Matrix

Table 2 Teaching Style Matrix Interpretation

Quadrant	Teaching goal interpretation	Teaching method interpretation
Quadrant A	Teacher prefers to teach students for rote learning (Example: Students memorize abstract facts, such as multiplication tables and atomic weights, through repetition.)	Teacher prefers to have students process information via symbols and language and work as individuals (Example: Students listen to a lecture.)
Quadrant B	Teacher prefers rote learning and focuses on practical applications (Example: Students learn practical facts about the real world, such as the tensile strength of different sizes of nails.)	Teacher prefers to have students process information via symbols and language and work in groups (Example: Students discuss problems in groups.)
Quadrant C	Teacher prefers to teach students for understanding but does not focus on practical applications (Example: Students learn abstract processes, such as how to plot vectors representing forces on an unidentified object in an undefined space.)	Teacher prefers to have students learn individually through hands-on activities. (Example: students working individually on computers)
Quadrant D	Teacher prefers understanding to rote learning and focuses on familiar applications. (Example: Students use formulas and apply processes such as plotting designs for car parts using AutoCAD.)	Teacher prefers to have students learn collaboratively through hands-on activities (Example: team lab projects)

Results

The demographics of the sample are shown in Table 3. A higher proportion of the sample comes from the engineering disciplines because three engineering faculties were involved in the study (civil, mechanical and electrical engineering) as opposed to one faculty each for the other disciplines.

Table 3 Sample distributions according to faculty, gender and experience

Academic discipline	Gender		Age				Total
	Male	Female	23-30	31-38	39-46	>46	
Engineering	38	32	29	17	17	5	70
Technical Education	23	7	5	5	7	13	30
Technology management	12	8	10	5	5	0	20
Information technology	10	10	9	6	4	1	20
Total	83	57	53	33	33	21	140

A higher percentage of the sample is also males, typical of population in the technical oriented disciplines.

Dominant teaching style of University lecturers

The most dominant teaching style is style DD whereby 43.6% of lecturers prefer this style (Figure 3). This style is the Understanding-applied & Enactive-cooperative style. The second most preferred style is style DB and DC, Understanding-applied & Enactive-individual (12.1%) and Understanding-applied & Symbolic-enactive (12.1%) respectively.

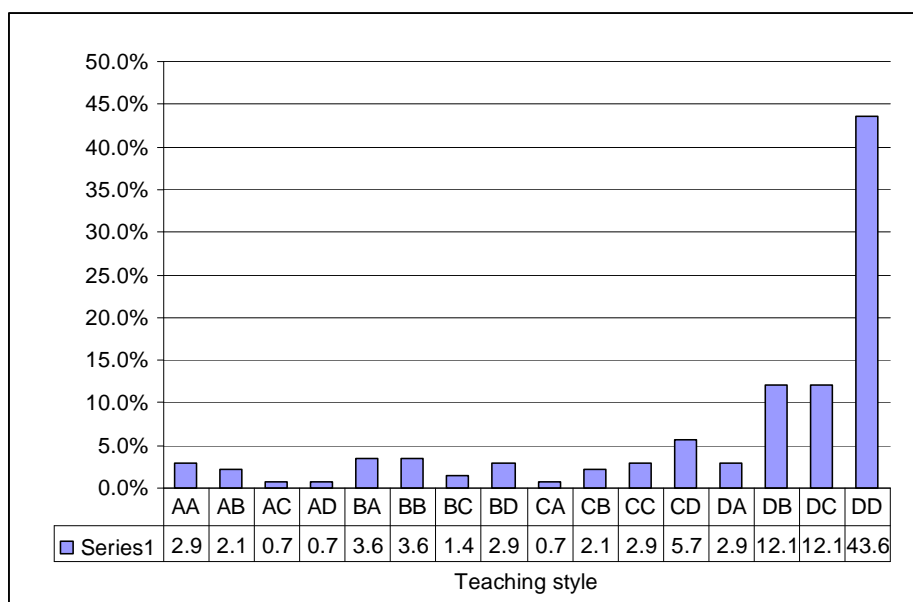


Figure 3 Distributions of teaching styles among lecturers

In the next section, result on teaching style based on teaching goal will be presented followed by teaching style based on teaching method.

Teaching style based on teaching goal

In this section, lecturers' teaching styles according to academic disciplines and teaching experience will be presented.

Teaching style vs academic discipline

Lecturers from all disciplines seem to prefer teaching for understanding with emphasis on familiar applications (Figure 4). Teaching for rote learning through familiar applications seems to be the next choice for the lecturers from the engineering and technical education faculties. Lecturers from the technology management and information technology best prefer the understanding and abstract learning.

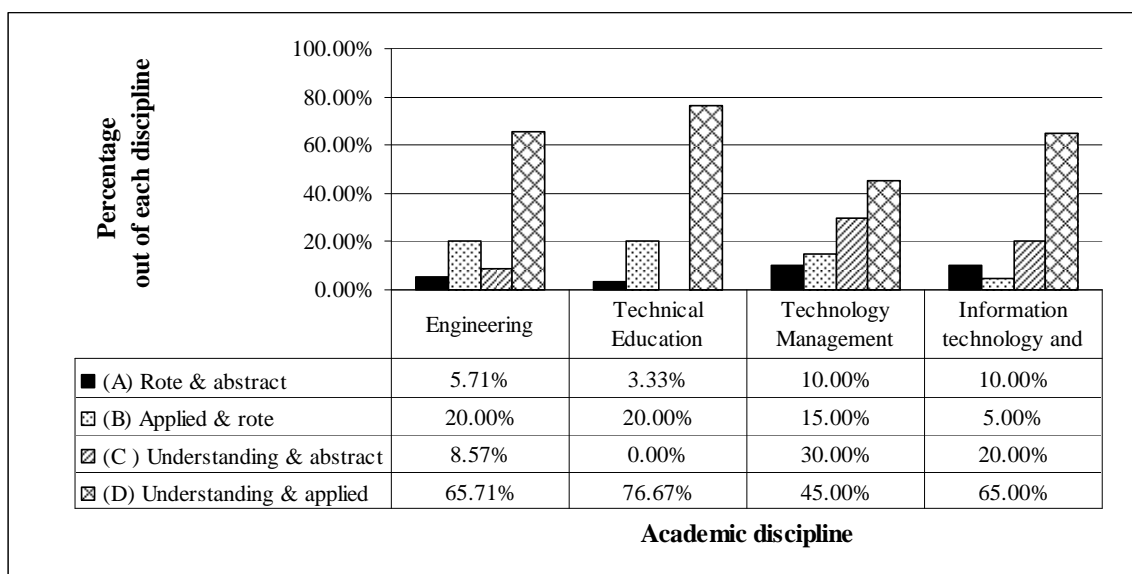


Figure 4 Teaching styles vs academic discipline

Teaching style vs experience

Both groups of lecturers, experienced and inexperienced lecturers prefer to teach for understanding through familiar applications (Figure 5). Next preferred style is style B for the experienced and style C for the inexperienced lecturers.

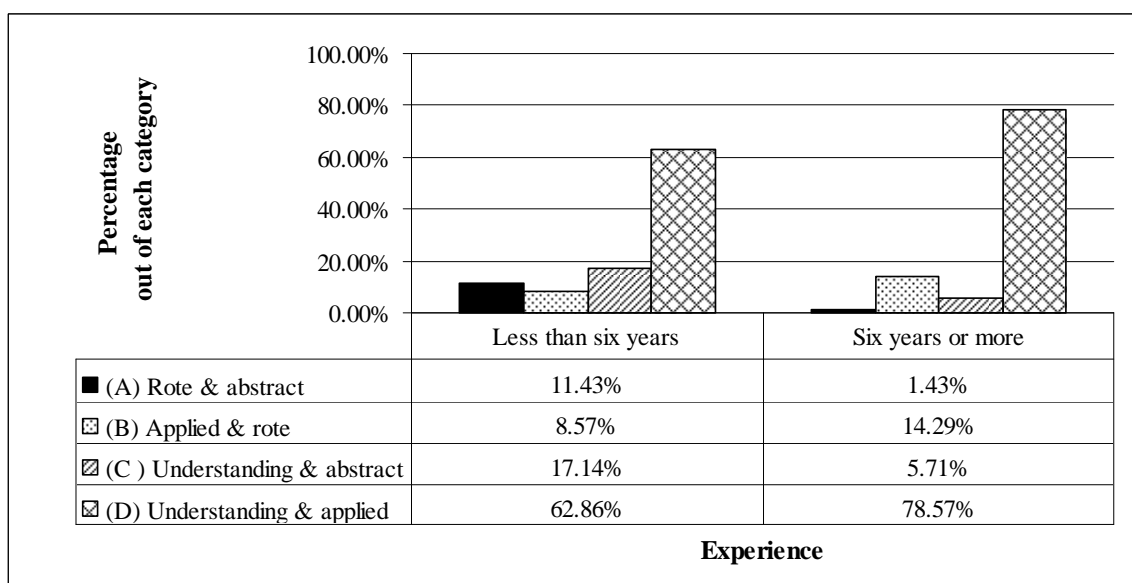


Figure 5 Teaching style vs teaching experience

Teaching style based on teaching approach

In this section, lecturers' teaching styles according to academic disciplines and teaching experience will be presented.

Teaching style vs academic discipline

The most dominant teaching style for all academic disciplines is teaching style D (Figure 6), where lecturers prefer to have their students learn collaboratively through hands-on activities. Second most preferred style for the engineering and technical education teachers is style B where lecturers prefer to have their students process information via symbols and language and work in groups.

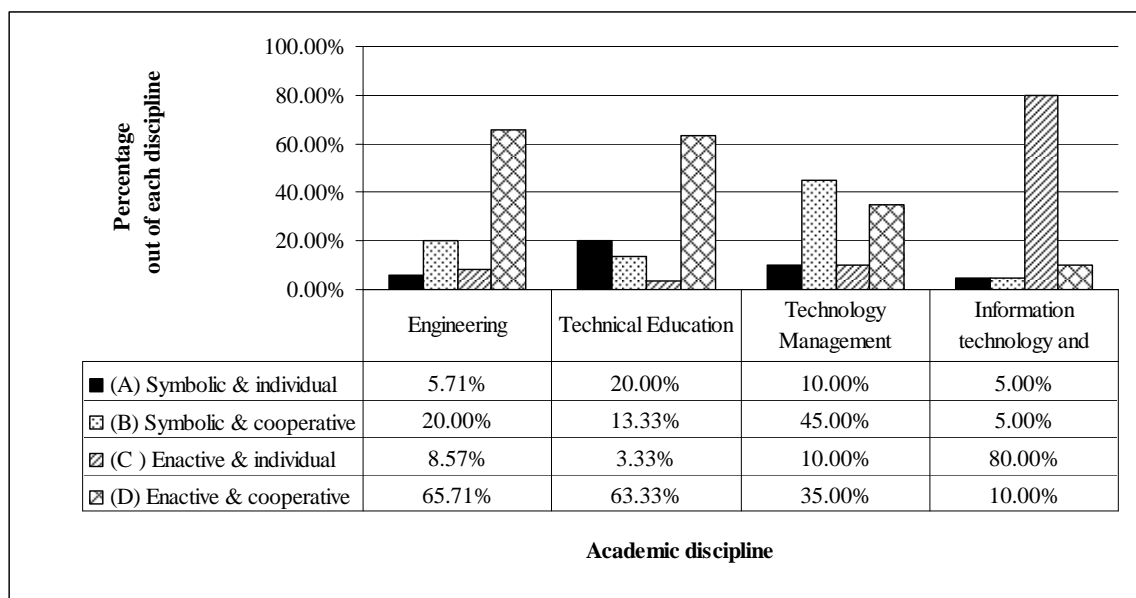


Figure 6 Teaching style vs academic discipline

Second most preferred style for the technology management and information and communication technology lecturers are style C where lecturers prefer to have students learn individually through hands-on activities. Least preferred style is style A for engineering and technology management, style C for technical education and style B for information technology and multimedia.

Teaching style vs experience

Experienced teachers tend to prefer enactive-cooperative method, style D (Figure 7) with higher percentage of experienced preferring the method. Next preferred method is the enactive-individual method (style C) for the experienced while symbolic-cooperative (style B) for the less experienced lecturers.

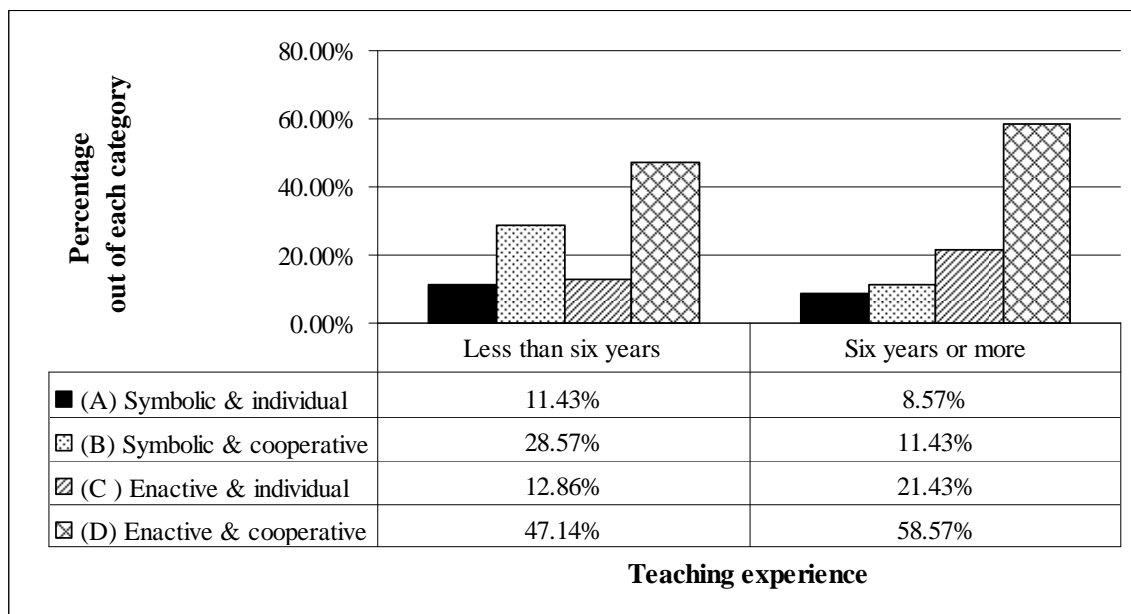


Figure 7 Teaching style vs teaching experience

Discussion

This study set out to determine the teaching styles of teachers in higher institutions using University lecturers as the sample. The CORD teaching style inventory was used which is made up of two teaching style dimensions, teaching goal and teaching method dimension. On the overall teaching styles, the results indicate that the most dominant teaching style among lecturers is style DD (43.6%), which means that University lecturers prefer teaching for understanding compared to rote learning, and focuses on familiar applications in the process. Lecturers also prefer to have students learn collaboratively through hands-on activities. The second most preferred style is style DC and DB, the difference being in the method while the teaching goal remains the same.

On teaching style according to teaching goal, the results indicate that most lecturers' teaching styles tend to fall within the applied-understanding quadrant and least in the rote-abstract quadrant. This indicates that lecturers prefer to teach for understanding using familiar examples, making the learning meaningful to students. This is an effective approach to helping students develop their understanding. It appears that even when lecturers are not specifically trained to teach a majority of them intuitively know what constitute effective teaching. However, there is one worrying issue here, the finding for the technical education lecturers indicate that none of their lecturers appears to prefer the abstract-understanding goal of teaching. Teachers are supposed to be those who are able to think in the abstract but if their lecturers were not in favour of this goal, where would future teachers be? They may not have the ability that is required of them.

When teaching experience is taken into account, the teaching goal of the experienced and inexperienced lecturers is also similar i.e., style D although there are more inexperienced lecturers choosing the other styles. The second most favoured style of the inexperienced lecturers is style B. There appear to be a higher percentage of the inexperienced lecturers aiming for understanding through abstract means, which is naturally quite a challenge. This is probably because of their lack of pedagogical skills and teaching inexperience.

On the teaching method dimension, the enactive-cooperative teaching style is most favoured by the technical education and engineering lecturers. This is not surprising because their curriculum require that students work in groups and do projects. The cooperative-symbolic method is most

preferred by the management lecturers and the individualized-enactive teaching method is preferred most by the information technology lecturers. The findings for the technology management lecturers and information technology lecturer are also not surprising because it reflect their curriculum requirements for example; IT students need to do a lot of individual work for designs projects etc.

The most preferred teaching method of the inexperienced and experienced lectures is also similar, style D (Enactive-cooperative) although there are fewer of the inexperienced in this category. It is also quite notable to see that there is high percentage of the inexperienced lecturers (28.57%) choosing the symbolic-cooperative style compared to the experienced lecturers (11.43%). So maybe, inexperienced may play a role in the choice of teaching style.

Conclusion

In conclusion, the most dominant teaching style of University lecturers is the Enactive-cooperative & Understanding-applied. Looking at the teaching goal and teaching method dimension individually, teaching styles of teachers in higher institution differ on the method of teaching dimension - depending on disciplines - but tend to be similar on the goal of teaching dimension. On the teaching method dimension, the cooperative-active teaching method is most preferred by the education and engineering lecturers; the cooperative-symbolic method is most preferred by the management lecturers and the individualized-enactive teaching method is preferred most by the information technology lecturers.

On the teaching goal dimension, application and understanding are the most cited goals of teaching while rote and abstract learning is the least preferred teaching goal. The results of this study have provided information on the relationships across teachers' teaching styles, teaching experience, and academic discipline in Universities. The understanding of these relationships can help guide University administrator in the preparation of teachers for University teaching and other higher institutions.

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