Use of Instructing Strategies in Teaching Content Subject to Different Types of Learners: Regular Program and International Programs

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Abstract

A huge increase in the numbers of international programs offered in Thai universities seems to be a common trend in Thailand. Presumably, the way in which international classes are conducted would be different from that in regular Thai classes. However, there seems to be very little knowledge of what really happens in those international classrooms compared to the Thai ones. Therefore, this paper aims to investigate the use of teaching strategies of a Computer Engineering teacher in teaching a content subject in a regular and an international program to see the similarities and differences of teaching strategies used. The subject of this study was a Computer Engineering teacher who taught Computer Architectures and Systems to third-year students in both regular and international programs at King Mongkut's University of Technology Thonburi. The research instruments were video recordings and observation checklists. The results of the study indicate that there were five teaching strategies used in both classes: Lecture, Questioning, Discussion, Review, and Using Media. Using Media and Lecture were used as the main teaching strategies in both classes. Nevertheless, the proportion of the use of all strategies in both classes was not remarkably different. When considering the data from the video recordings, it is found that there are two factors that cause no difference in the use of the teaching strategies in both classes: (1) the nature of the two classes; (2) the content of the lectures.

Keywords: Teaching Strategies, Instructing Strategies, Content Subject, Regular Program, International Program

1. Introduction

Nowadays, a number of colleges and universities in Thailand offer an increasing number of international programs, and there are about 685 accredited international programs at undergraduate and graduate levels. King Mongkut's University of Technology Thonburi is one of the universities which have intensively promoted international programs at the undergraduate level, for example, in the faculty of Engineering, the faculty of Information Technology, and the faculty of Architecture.

In private talks with a Computer Engineering teacher who has a great deal of experience teaching in both the international and regular programs, she said that most of the students in the international program are Thai and did not graduate from international high schools. Thus, some of them are not good at English. So, they may have some problems with the language used in the classroom. On the other hand, students in regular programs do not have any problem with the language used while learning in class because they learn all subjects in Thai, their native language. Since English used in the international program may cause learning difficulties, to facilitate students' learning, the teacher may need to apply some teaching strategies to suit particular groups of learners. Therefore, it is interesting to investigate what teaching strategies the teacher uses to teach the same content to students in both programs through different types of medium of instruction. The findings from this study could provide useful information for teachers in teaching international programs, and thus it may raise some awareness of the language and teaching strategies used to facilitate classroom learning.

2. Literature Review

Freiberg and Driscoll (2000) state that the word 'teaching' comes from Greek, which means show, point out, direct, or guide. The word 'strategy', from the Greek 'strategia', is defined as the art of devising or employing a plan toward a goal. McClosky (1971) defines teaching strategy as a teaching approach that is used either in solving a classroom problem or in improving instruction. Stones and Morris (cited in Singh, 2008, p. 64) state that "teaching strategy is a generalized plan for a lesson, which includes structure, desired learner behavior in terms of goals of instruction and an outline of planned tactics necessary to implement the strategy."

Teaching strategies is an important component of classroom teaching; if the teachers know "what to teach" but they do not know "how to teach", they may not be able to convey the information to students effectively. Freiberg and Driscoll (2000, p. 5) state that "effective teaching demands teaching strategies that can accommodate the variety of contexts in which teachers will teach, the variety of content that must be taught, and the variety of learners with different backgrounds, needs, and problems." Therefore, in order to make teaching and learning more effective, teachers should not only have a deep knowledge of content, but also know how to apply teaching strategies in the classroom.

Teaching strategy is divided into three main frameworks (see Table 1). It is based on the analysis of research and practice, namely, organizing strategies, instructing strategies, and assessing strategies (Beck, 1998; Houston, 1990; Wittrock; 1986). Organizing strategies describe much of the work that precedes teaching e.g., planning, designing, and managing. They provide a foundation for instruction and pave the way for the

teachers to teach. Instructing strategies can be directly observable in class e.g., lecture, questioning, discussion, interactive practice, grouping, role play, simulation, drama, audiovisuals, and computer and multimedia. They focus on "how" to teach content to learners. Assessing strategies aim at the measurement of learning outcome such as assessment of learning, and self-improvement through self-assessment.

Table 1 Frameworks of Teaching Strategies

Organizing Strategies	Instructing Strategies	Assessing Strategies
Planning Design Use of Time Advance work Management	Lecture, Questioning and Discussion, Interactive Practice, Grouping, Reflective Teaching and Learning, Role play, Simulation, Drama, Service Learning, Community Resources, Audiovisuals, and Computer and Multimedia	Assessment of Learning Self-improvement through Self-assessment

There is a variety of instructing strategies that teachers can use in classroom. A list of main instructing strategies gathered from several studies including their descriptions is provided as follows:

I. Lecture: Lecture refers to a strategy for communicating ideas to others (Freiberg and Driscoll, 2000) through which teachers are enabled to convey large amounts of information to students. Moreover, the lecture method is appropriate for instructing students about the key ideas in a subject, and for acquisition and retention of factual information.

For many years, lecture was the most widely used instructional strategy in college classrooms. "Nearly 80% of all U.S. college classrooms in the late 1970s reported using some form of the lecture method to teach students" (Cashin, 1990, p .60). Furthermore, Good and Brophy (1994, p. 380) indicated that "two key features of good lectures are the clarity of the information and the enthusiasm of the presentation". Further, Cangelosi (1993, p. 156) found that "for students to be engaged in lecture-type learning activity, they must attentively listen to what the teacher is saying…. Such engagement requires the students to be cognitively active, while physically inactive." A number of studies supported the use of lecture "to introduce a unit or build a frame of reference…[for]

demonstrating and clarifying matters…[to] set the atmosphere or focus of students' activities…[and for] introducing and summarizing the major concepts that were presented in a lesson" (Henson, 1980, p. 116).

In using lecture, teachers teach students by giving spoken explanations of the subject. According to State University (2011), there are four phases when teachers use this strategy. The first phase is when a teacher begins the lecture by explaining the goals and expectations of the lesson and by helping students retrieve appropriate prior knowledge. In the second phase, the teacher provides "scaffolds" that help students link new information to what they already know. For the third phase, the teacher pays particular attention to order and clarity, and provides concrete examples and illustrations that help students make required connections to what they already know. In the last phase, the teacher checks for student understanding and helps them integrate what they have learned.

II. Questioning: Questioning forms an integral part of most strategies for effective teaching (Killen, 1998). It is an important component of teacher clarity (Hines, 1981). It enables teachers to know what they should do after questioning. For example, when students respond to the question, the teacher can know whether they understand the content. If the students do not understand it, the teacher can then choose the most appropriate strategy to help students understand it better. In addition, questioning can be a vehicle for introducing variety into lessons, and a means of enabling even slow learners to experience some success in their learning (Martin, 1979). According to Watson Todd (1997), and Freiberg and Driscoll (2000), teachers can use questioning for a variety of reasons. The most common ones include:

a) Checking for student understanding of instruction: questioning allows the teacher to respond immediately to the level of student comprehension and modify instruction through different examples or instructional strategies.

b) Evaluating the effectiveness of the lesson: questioning enables the teacher to judge the effectiveness of instruction.

c) Increasing higher-level thinking: verbal questioning assists in judging the depth of student comprehension during the lesson.

d) Stimulating motivation, interest, and participation: questioning can stimulate student interest in the lesson and give students opportunities to participate in classroom.

III. Discussion: Discussion is the exchange of ideas among students or between teacher and students (Freiberg and Driscoll, 2000). Killen (1998) states that discussion is an orderly process of face-to-face group interaction in which people exchange ideas about an issue for the purpose of solving a problem, answering a question, enhancing their knowledge or understanding, or making a decision.

In order to do a discussion, people must talk, listen, and respond to one another. In addition, people must be collectively putting forward more than one point of view, and they must have the intention of developing their knowledge, understanding, or judgment of the issue under discussion (Bridges, 1979, 1988, 1990). Killen (1998) suggests that the participants should concentrate on helping each other to reach a better understanding of the issue involved, rather than trying to convince each other that their personal view is somehow the correct view. He also states that the most appropriate time to use a whole-class discussion as a main teaching strategy is likely to be when the teacher wants students to develop their understanding by drawing on their prior knowledge and experience. Since this study emphasizes teacher's strategies, the researchers will focus only on teacher-students discussion.

IV. Review: Review means looking again or relooking at something, or going back over material (Freiberg and Driscoll, 2000). Teachers try to recall what students learned from the contents or previous lessons. Review can be conducted in many ways. For example, teachers can use questions, quizzes, summaries, games and practice exercises to review the contents in classroom (Watson Todd, 1997).

V. Using media: There is a variety of media that can be used in classroom according to Freiberg and Driscoll (2000) as seen in the following list.

v.i Overhead Projector: It projects a written or graphic image on a screen or wall. Teachers can use it to display a study outline for the class or to list student ideas. Its uses are not limited to any curricular area, and it is easily transportable.

It should be noted that the use of an overhead projector in classroom might be outdated. In these days, a visualizer, with similar work purposes but more advanced functions, has become a replacement. Therefore, in this study, both the overhead projector and the visualizer are included in this category.

v.ii Slide Projector: This machine projects pictures with highly color saturated images and the user can keep the room lights on. Slides can be taken by teachers, students, parents, or purchased from commercial producers.
As well as the overhead projector, the use of a slide projector in classroom is rarely observed. However, since there is no obvious replacement, it is listed in this study, just in case it happens to be used.

v.iii Television: Television (TV) is a telecommunication medium for receiving and transmitting moving images with accompanying sound. It is available in most classrooms.

v.iv Audiotapes and Compact Discs: An audiotape is a tape recording of sound. A Compact Disc (CD) is an optical disc used to store digital data. These two instruments are inexpensive and simple to use.

v.v Films, Videotapes, and Videodiscs: A film is a series of still or moving images. It is produced by recording photographic images with cameras, or by creating images using animation techniques or visual effects. A videotape is a recording of images and sounds onto magnetic tape. A videodisc is a general term for a laser- or stylus-readable random-access disc that contains both audio and analog video signals recorded in an analog form. All of these can support learner motivation.

v.vi Board: There are four types: a chalkboard, a bulletin board, a whiteboard, and an electronic whiteboard. Chalkboards come in all sizes, shapes, and several colors. They do not need a bulb or an electrical outlet, and teachers can write what they want to write. A bulletin board is a surface intended for the posting of public messages. It is often made of a material such as cork to facilitate addition and removal of messages. It comes in different sizes and shapes, offering ease of use and accessibility. A whiteboard is a name for any glossy, usually white surface for nonpermanent markings. An electronic whiteboard is a large interactive display that interfaces with a computer. The computer's desktop is displayed on the board by a digital projector. Teachers can control the computer by using a pen, finger, or other devices.

v.vii Demonstration: The meaning of the word 'demonstration' is the act or circumstance of pointing out or showing by display including showing by reasons or proofs, and explaining or making clear by use of examples or experiments. Demonstrations make information more concrete and are often interesting to students (Freiberg and Driscoll, 2000).

v.viii Computer and Multimedia: Computers can be used to access the Internet. The term multimedia describes "virtually any conjunction of media on the computer screen" (Lynch, 1993).

In sum, there are five commonly used classroom teaching strategies according to several studies (Freiberg and Driscoll, 2000; Beck, 1998; Houston, 1990; Wittrock; 1986). Therefore, in this study the researchers decided to use them as criteria in analyzing teacher's strategies in the observed classrooms. Moreover, since the researchers needed to investigate the teaching strategies used by the Computer Engineering teacher in teaching both regular and international classes, the researchers decided to emphasize instructing strategies which concentrates on "how" to teach the content to learners rather than organizing and assessing strategies.

3. Methodology

This section describes the subject, instruments, procedures, and data analysis.

3.1 Subject

The subject of this study was a male Computer Engineering teacher who taught Computer Architectures and Systems to third-year students in both regular and international programs at King Mongkut's University of Technology Thonburi. The

subject taught students the same topic (Parallel Architecture-Symmetric Multi-Processor and Multicore System) in both programs. Each class took about 100 minutes. There were about 50-60 students in the regular program classroom and 40-50 in the international program classroom. In this study, the term 'RP class' stands for the Regular Program class and 'IP class' stands for the International Program class. The type of class is a lecture. The researchers decided to observe the lecture classes because they could observe the teaching strategies that the teacher used in conveying information, history, background, and theories.

3.2 Instruments

There were two research instruments:

Video recording: The researchers used a video recorder to capture the details of the teaching strategies employed by the teacher. In each class, the teaching was recorded for 100 minutes. The video recorder was set at the back of the class because it was easy to control the video recorder and the researchers did not want to disturb the students while observing the class.

Observation-Checklist: The researchers decided to do an observation using a checklist in order to obtain the data concerning teaching strategies employed by the subject. The researchers used an instructing strategies list (see Appendix I) to design the observation checklist.

3.3 Procedures

At the beginning, the researchers prepared a video recorder and designed a checklist. Then, a co-observer, who was doing her master's degree in English Language Teaching, was invited to help observe the class. The researchers asked her to study information about instructing strategies and also explained some unfamiliar strategies to her.

Next, the researchers asked permission from the Computer Engineering teacher who was the subject to video record and observe his classes in each program for 100 minutes. The subject was informed that the topic of teaching and the details should be the same for both lectures.

Then, the researchers and the co-observer went to the classroom to video record and observe his classes. The researchers did a recording and observed teaching strategies used in the regular program for 100 minutes. Then, the same process was done with the international program class.

After that, the data from the videos were transcribed. Since the video recorder was set at the back of the class and the voice of the teacher was quite low, the researchers sometimes could not hear some words clearly. Therefore, the co-observer was asked to double-check the video and the transcripts.

3.4 Data analysis

First, the data from the observation were tallied to show the number of subject's use of each instructing strategy in both regular and international programs. After that, the data gained from the observation checklists of the researchers and the co-observer were compared to find out the percentage of agreement that could prove the reliability of the research instrument.

The formula for reliability coefficient is as follows:

PAO = A/*n*
PAO = proportion agreement, observed
A = the number of agreements between the two coders
n = the total number of units the two coders have coded for the protocol

The reliability coefficient was 0.94 which means that the observation checklist was a very reliable tool.

Then, the data in the transcripts were analyzed using content analysis.

4. Findings

The total frequency of use of instructing strategies which occurred in the regular and international programs by the subject is shown in Table 2.

Table 2 The frequency of use of instructing strategies in regular and international programs

Instructing Strategies	Regular	%	International	%
1. Lecture				
a. Explaining the goal and expectations of the lesson	3	1.60	7	3.66
b. Providing "scaffolds"	5	2.67	4	2.09
c. Clarifying and providing examples and illustrations	48	25.67	47	24.61
d. Checking for student understanding	0	0	0	0
Total	**56**	**29.94**	**58**	**30.36**
2. Questioning				
a. Checking for student understanding of instruction	8	4.28	4	2.09
b. Evaluating the effectiveness of lesson	0	0	0	0
c. Increasing higher-level thinking	18	9.63	26	13.61
d. Stimulating motivation, interest and participation	4	2.14	14	7.33
Total	**30**	**16.05**	**44**	**23.03**
3. Discussion				
a. Solving a problem	0	0	0	0
b. Answering a question	1	0.53	0	0
c. Enhancing knowledge or understanding	0	0	0	0
d. Making a decision	2	1.07	1	0.52
Total	**3**	**1.60**	**1**	**0.52**
4. Review				
a. Questions	4	2.14	2	1.05
b. Quizzes	0	0	0	0
c. Summaries	11	5.88	5	2.62
d. Games	0	0	0	0
e. Practice exercises	0	0	0	0
Total	**15**	**8.02**	**7**	**3.67**
5. Using media				
a. Overhead Projector/Visualizer	24	12.83	30	15.71
b. Slide Projectors	0	0	0	0
c. Television	0	0	0	0
d. Audiotapes and Compact Discs	0	0	0	0
e. Films, Videotapes, and Videodiscs	0	0	0	0
f. Board	24	12.83	37	19.37
g. Demonstration	29	15.51	14	7.33
h. Computer and Multimedia	0	0	0	0
Total	**77**	**41.17**	**81**	**42.41**
Total	**181**	**100**	**191**	**100**

To find out if the instructing strategies used in the two classrooms were significantly different, a chi-square test was conducted [1]. As a result, a chi-square value obtained was 4.626, and this made its p-value to be 0.201 ($p > 0.05$). Thus, it could be concluded that the teacher's use of instructing strategies in both RP and IP classes was not significantly different.

According to Table 2, of all the five main strategies, 'using media' was the most frequently used strategy in both classes (41.17% in RP and 42.41% in IP classes). Next, ' lecture' was the second most used (29.94% in RP and 30.36% in IP classes). The use of ' questioning' came third, with 16.05% in the RP class and 23.03% in the IP class. The fourth used strategy was 'review', with 8.02% in the RP class and 3.67% in the IP class. ' Discussion' was a rarely used strategy in both classes. It occurred only 1.60% in the RP class and 0.52% in the IP class.

The proportions taken by different strategies stated some salient information. It seemed that the teacher used 'using media', 'lecture', and 'discussion' rather similarly in terms of their frequencies. In contrast, the frequencies of the teacher using 'questioning' and ' review' illustrated some minor differences. That is, the teacher seemed to ask more questions in the IP class than in the RP class. Unlike 'questioning,' the teacher used ' review' twice as much in the RP class as in the IP class.

5. Discussion

It is interesting that the subject used more or less similar instructing strategies in both RP and IP classes. The total frequencies of all instructing strategies used in both classes do not indicate a remarkable difference.

With this type of a content subject, it is not surprising to find that 'lecture' was one of the commonly used strategies in both RP and IP classes. Also, to facilitate learning, ' using media' was regularly used in both classes. Thus, this may be interpreted that the major strategies that the teacher always used, regardless of the types of classes, are ' lecture' and 'using media'. 'Discussion' was a strategy that appeared in similar amounts in the two classes. However, the proportions it took were very small. Therefore, it might be said that 'discussion' was the teacher's optional strategy.

The differences in the use of strategies in the two classes are worth discussing in more detail. As mentioned above, 'questioning' and 'review' were used in different amounts in the RP and IP classes. For 'questioning,' when considering the data from the videos, it is found that the main factor influencing the different amounts of this strategy in the RP and IP classes is students' participation in the classroom. Students in the RP class highly interacted and participated in class. They tried to answer questions many times and they also asked the teacher some questions. Thus, the teacher did not need to repeat or ask other questions. In contrast, students in the IP class rarely displayed their interactions. They answered the teacher's questions only once. Therefore, to elicit

students' answers in the IP class, the subject teacher needed to ask questions more frequently.

However, it seems that the subject did not use 'questioning' properly. The data shows that many times in both the RP and IP classes after asking questions, the subject did not wait for students' answers and did not spare a moment for students to think. Thus, the students especially in the IP class had few chances to think and participate in class. As the language used in the IP class was L2, the students might have needed time to interpret a question's meaning and think about the answer. Watson Todd (1997) mentions that the teacher should pause after asking a question to let students decipher the meaning of the question and generate a response. Therefore, the subject teacher should have been aware of the objectives of asking questions. If he had wanted to increase the level of students' thinking, he should have waited for a while after asking a question to let students complete two steps: decode its meaning (especially when using L2), and generate a response.

'Review' was another strategy that showed different amounts of use in the two classes. The subject used 'review' more frequently in the RP class than in the IP class. The reason for this is that as the language used in the RP class was L1, the students did not get confused whether the teacher reviewed what they had learned in the previous lesson or taught new things to them. In contrast, the use of L2 in the IP class might confuse students whether the teacher was reviewing the previous lesson or teaching them new things. However, the subject should have considered and balanced the use of review in order to give fair treatment to students in both classes. In using review in the IP class, the subject should have thought of ways to cope with students' confusion and considered some other techniques to help the students in the IP class understand the previous lesson rather than avoid it.

6. Conclusion

This study was conducted to find out instructing strategies that the subject teacher used to teach the same content through different means of instruction (L1 and L2). The results of the study reveal that there were five instructing strategies used in both classes: lecture, questioning, discussion, review, and using media. The teacher used media and lecture more frequently than other strategies in both classes. Nevertheless, the proportion of the use of all strategies in both classes was not different. However, it is important to bear in mind that this study was done with a single case; as a result, the findings of this study cannot be applied to other teachers who teach students in both RP and IP classes. For further study, to gain more information, the same study should be replicated with a larger number of subjects. In addition, interview is a useful instrument that should be applied to gain more insights about the teacher's reasons for using certain types of teaching strategies.

Note

[1]: Categories of teaching strategies 2 and 3 (Questioning and Discussion) are combined for chi-square calculation to avoid the weakness of the method when the frequency is less than 5.

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Appendix I Instructing strategies list

Instructing Strategies	Description
1. Lecture	Lecture refers to a strategy for communicating ideas to others (Freiberg and Driscoll, 2000). Teachers will teach students by giving spoken explanations of the subject in 4 phases (State University, 2011): 1. Explaining the goal and expectations of the lesson 2. Providing "scaffolds" 3. Providing examples and illustrations 4. Checking for student understanding
2. Questioning	Questioning forms an integral part of most strategy for effective teaching. It is an important component of teacher clarity (Hines, 1981). Teachers can use questioning for a variety of reasons (Watson Todd, 1997, Freiberg and Driscoll, 2000): 1. Checking for student understanding of instruction 2. Evaluating the effectiveness of lesson 3. Increasing higher-level thinking 4. Stimulating motivation, interest and participation
3. Discussion	Discussion is an orderly process of face-to-face group interaction in which people exchange ideas about an issue for the purpose of (Killen, 1998): 1. Solving a problem 2. Answering a question 3. Enhancing knowledge or understanding 4. Making a decision
4. Review	Review means looking again or relooking at something, going back over material (Freiberg and Driscoll, 2000). To review the contents in classroom, teachers can use (Watson Todd, 1997): 1. Questions 2. Quizzes 3. Summaries 4. Games 5. Practice exercises
5. Using media	There is a variety of media used in classroom according to Freiberg and Driscoll (2000).
5.1 Overhead Projector, Visualizer	It projects a written or graphic image on a screen or wall. Its uses are not limited to any curricular area, and it is easily transportable.

Instructing Strategies	Description
5.2 Slide Projectors	This machine projects pictures with intense images and the user can keep the room lights on. Slides can be taken by teacher, students, parents, or purchased from commercial producers.
5.3 Television	Television (TV) is a telecommunication medium for transmitting and receiving moving images with accompanying sound. It is available in most classrooms.
5.4 Audiotapes, and Compact Discs	An audiotape is a tape recording of sound. A Compact Disc (CD) is an optical disc used to store digital data. It is inexpensive and simple to operate.
5.5 Films, Videotapes, and Videodiscs	A film is a series of still or moving images. It is produced by recording photographic images with cameras, or by creating images using animation techniques or visual effects. A videotape is a recording of images and sounds onto magnetic tape. A videodisc is a general term for a laser- or stylus-readable random-access disc that contains both audio and analog video signals recorded in an analog form. All of these can support learner motivation.
5.6 Board	There are four types. 1. Chalkboard: Chalkboards come in all sizes, shapes, and several colors. They do not need a bulb or an electrical outlet, and teachers can write what they want to write. 2. Bulletin board: Bulletin boards come in different sizes and shapes. They offer ease of use and accessibility. 3. Whiteboard: Whiteboard is a name for any glossy, usually white surface for nonpermanent markings. 4. Electronic whiteboard: Electronic whiteboard is a large interactive display that interfaces with a computer. The computer's desktop is displayed on the board by a digital projector.
5.7 Demonstration	Demonstration is point out or show by display. Demonstrations make information more concrete and are often interesting to students (Freiberg and Driscoll, 2000).
5.8 Computer and Multimedia	Computers can be used to access the Internet. The term multimedia describes "virtually any conjunction of media on the computer screen" (Lynch, 1993).

Appendix II Observation-Checklist

What teaching strategies are employed by the Computer Engineering teacher while teaching in Thai and English?

Class:.....Topic:.....

Date:.....Start time:.....Finish time:.....

Instructing Strategies	**Frequency**	**Note**
Lecture		
Questioning		
Discussion		
Review		
Demonstration		
Board		
Overhead Projector/visualizer		

Note:

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