



INNOVATIVE TEACHING TECHNIQUE: THE 3T PEDAGOGICAL MODEL FOR COMPUTER SCIENCE DEGREE PROGRAMME

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Abstract

The present study 'Use of test-teach-test method in Computer Science classes' aims to find out the effect of teach-test-teach method in developing in computer scheme of Bachelor level second year students in the faculty of computing, General Sir John Kotelawala Defence University, Sri Lanka. For this experimental research, the sample population consisted 31 BSc students from a Computer Science college, Suriyawewa Sri Lanka who were selected using purposive non-random sampling procedure. This paper outlines how a Test Teach Test approach could address the noted lack of returns on Sri Lankas substantial investment in computer science field by promoting student centric method. A pre-test was administered before they were taught the lesson. After teaching method of Test Teach Test, post-test was administered by using the same set as that was used in pre-test. The results of both the tests were compared and determined using simple statistical tool; mean. The findings revealed that the experimental group in Teach Test Teach was found to be performed significantly higher than controlled group.

Key words: Teaching, Testing Teaching, Testing, Computer Science Scheme

1. Introduction

By learning you will teach, by teaching you will learn. In education, teaching is the concerted sharing of knowledge and experience, which is usually organized within a discipline and, more generally, the provision of stimulus to the psychological and intellectual growth of a person by another person or artifact (Impedovo and Iaquina; 2012). Teachers all over the world use different teaching methods to improve their teaching with a universal hope to improve the learning of these students.

Teaching is a process of imparting ideas of a person or group to many other people. Generally, teaching is the job of a teacher. A teacher uses different teaching, learning activities to make learners learn what they are taught. The process of teaching is guiding and facilitating learning, enabling the learners to learn, setting the conditions for learning. Sri Lanka is a multilingual country where English is learned as a secondary language. In this context, Widyantoro (2012) mentions that teaching is a complex job as it involves lots of knowledge, skills and activities. It includes knowledge of the foreign language, the learners and the learning process, the teaching methods and techniques. It involves a lot of skills such as questioning skills and pedagogical skills and a lot of activities, starting from planning, teaching and testing (Larson, 2000).

Teaching and learning cannot be separated since teaching is the interaction between the teacher and the learners about a given subject directed to learning under a context and both teacher and learners actively involve on it. In this vein, Wilson and Peterson (2006) asserted that teaching is a shared work between students and teachers where teacher still has responsibility for making sure that students learn better. Co-operative learning, team learning, reciprocal teaching, etc. can be the proper ways for a teacher to make the students understand the subject matter (Schnelle, 2010).

A computer degree programme teacher not only teaches and shares but tests the efficiency and effectiveness of his/her teaching and the proficiency developed on the part of learners. Teaching and testing are not separated from each other. Testing is a part of teaching process. Unlike other methods, it claims that a teacher must test students' prior knowledge of the target language for two reasons: one is to find out their current level of knowledge and the other one is to explore the problem that they have so that the teacher can plan to teach the target language systematically. Test-teach-test (TTT) method helps the teacher make his/her input comprehensible. Krashen (1983, as cited in Schutz, 2014) concedes. Bondjema (2014) explains that TTT is a useful approach as it enables



teachers to identify the specific needs of learners concerning a language area and address this need suitably. In the same context,

TTT it is a method of teaching learning process where learners first complete a task or activity without any support from teachers. They are involved in a pre-teaching activity in the form of a test. The teacher administers a test on them on an issue as if s/he is carrying out an action research to detect the problem (Richards & Rodgers, 2001). Then, based on the problems seen in the test, the teacher plans and presents the target language. The students are involved in various knowledge building activities of teaching learning process. Finally, the teacher tests the students' achievement or performance and the learners do another task to practice the new language. We have used this method of teaching in computer degree program first time in the General Sir John Kotelawala Defence University, Sri Lanka.

In this context, the present study has been carried out to see whether the TTT method is appropriate and effective to bring qualitative change in their Computer science degree programe in achievement and performance. However it is obvious that TTT cannot be applied to all the lessons we teach. For an example, if the lesson is about a new theory in computer security, then in such situations we cannot pre-test students' knowledge about that theory because most of the students may have no idea about the concept and then it will become a waste of time.

2. Methodology

2.1 Research Design

In this study, we have examined General Sir John Kotelawala Defence University's (KDU's) cadet and civilian students' response to Effective Teaching with Different Teaching Methods, especially concepts and knowledge on the Test Teach Test (TTT) Method platform in the Defence university system. This topic was judged to be extremely important to have a conceptual understanding of what is teaching methods and to find out in detail knowledge on current trends in using appropriate teaching methods in a state Defence university. The study design in this study is presented in the Figure 1. Approval for the study was obtained from the Staff Development Center. Target population of this study represents 11 cadet and 20 civilian students following a Computer Science undergraduate course. All students assessed from the feedback given before and after the TTT method was implemented through a questionnaire. Thirty-one students, which participated in the study and gave their consent, were included in the study. The purpose of the study was explained to the students at the beginning of collecting data. The cadet students who consented to participate in the study were individually tagged and given them a tag. ($n=31$).

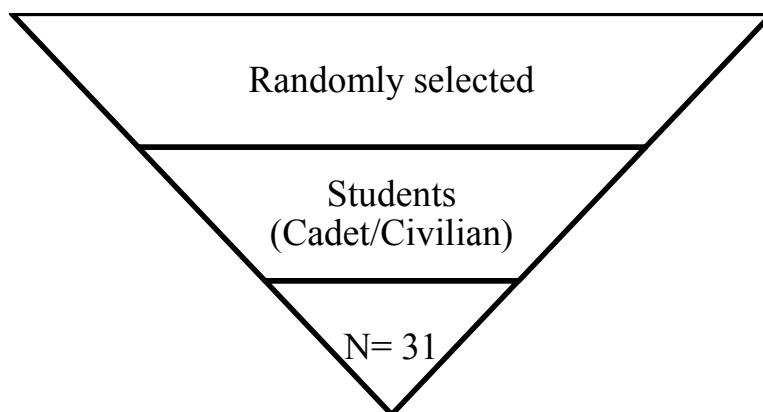


Fig. 1. Study Design

2.2 Research Context and Participants

Thirty-one cadet and civilian students took part in this study. All cadet students were employed at the university as cadet officers enrolled as students. The civilian students were second year Computer Science students. KDU's student population is a socially and economically diverse community in Western Province of the country in the



one and only Defence University in Sri Lanka. The students did not have the background knowledge of TTT participatory teaching methods.

2.3 Taking feedback among Cadet and Civilian Students

The feedback was taken from each of the thirty-one respective cadets and civilian students of the sample population at the university; with respect to TTT participatory teaching methods within a period of two semesters feedback was collected form of a questionnaire. Care was taken to avoid exchanging the students' information or ideas.

2.4 Data Presentation and Analysis

To analyze the questions, we compared informal reasoning displayed by individuals representing high and low level of understanding of teaching methods. The validity of the translation was independently assessed by two observers competent in the English language. We analyzed our data as a balanced figure in a percentage of application. For statistical analysis, we transformed all our data using the basic statistical analysis package

3. Results

3.1 Reflection of the application of Teaching Methods

Thirty one (31) Students were participated for the questionnaire. The questionnaire was given immediately after finishing a lesson completed with the use of TTT method.

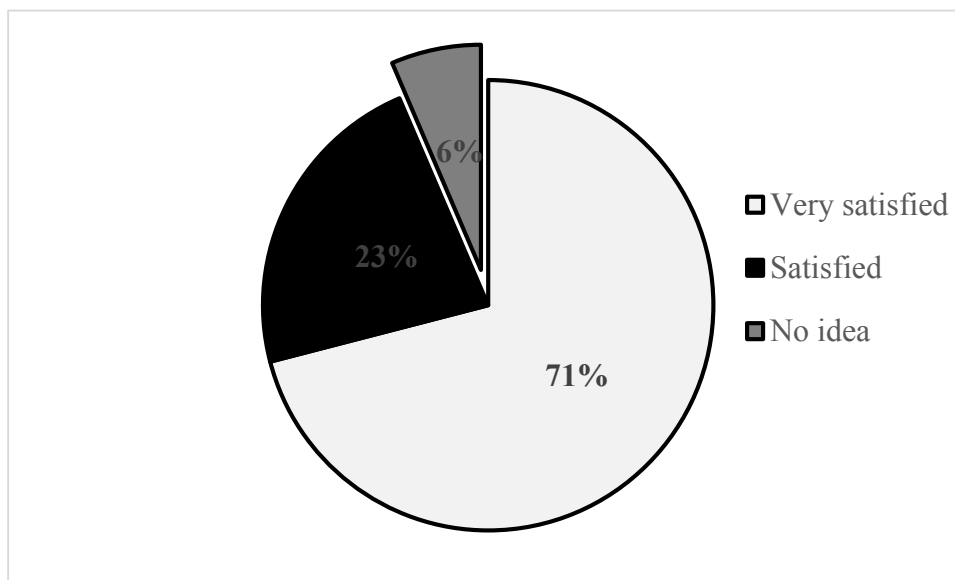


Fig. 2 - Overall idea about the teaching method.

TTT Method is used first time in computer science scheme in General Sir John Kotelawala Defence University. This teaching method is well established in the English department. After introducing the TTT method we have evaluated the overall impact on teaching whether it is effective or not. Most of the students 71% very much satisfied with the new teaching method (Figure 2). The results conclude that most of the students are aware and are satisfied with the new method used for the lesson.

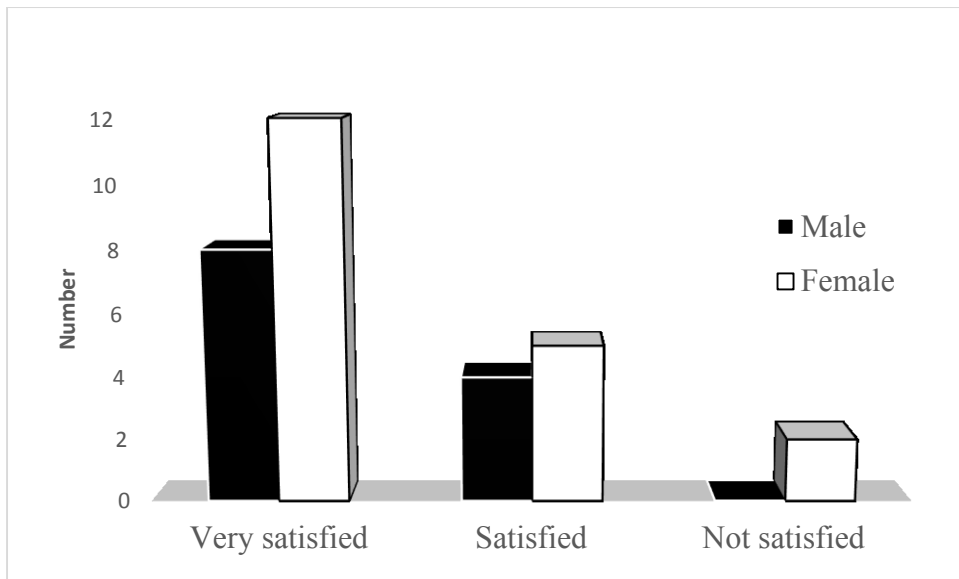


Fig. 3- Overall idea about the teaching method gender-wise

In this study we have analyzed the feedback with respect to gender. Female students were given the feedback very satisfied with the new teaching method. Teaching was done by a female lecturer and we are not sure that it was influenced. But mostly females are more satisfied than the males in this teaching method (Figure 3)

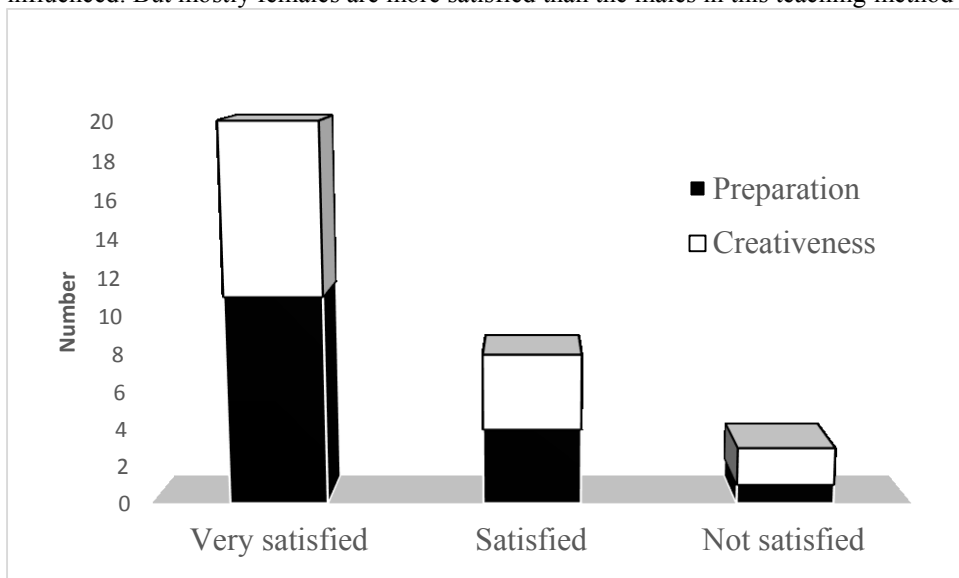


Fig. 4: Preparation and Creativity of the lecturer

With the new method it shows that students are very satisfied with the preparation and the creativeness of the lecturer. According to the figure 4 what it reflects is there is lot of preparation and creativeness is needed in TTT method. It might also important to know how pre-testing and post-testing affected the students. In order to examine the difference between the experimental group's pre-test and post-test result the descriptive statistics were calculated. Figure 5 depicts the overall satisfaction of the students regarding testing the knowledge before and after the lesson.

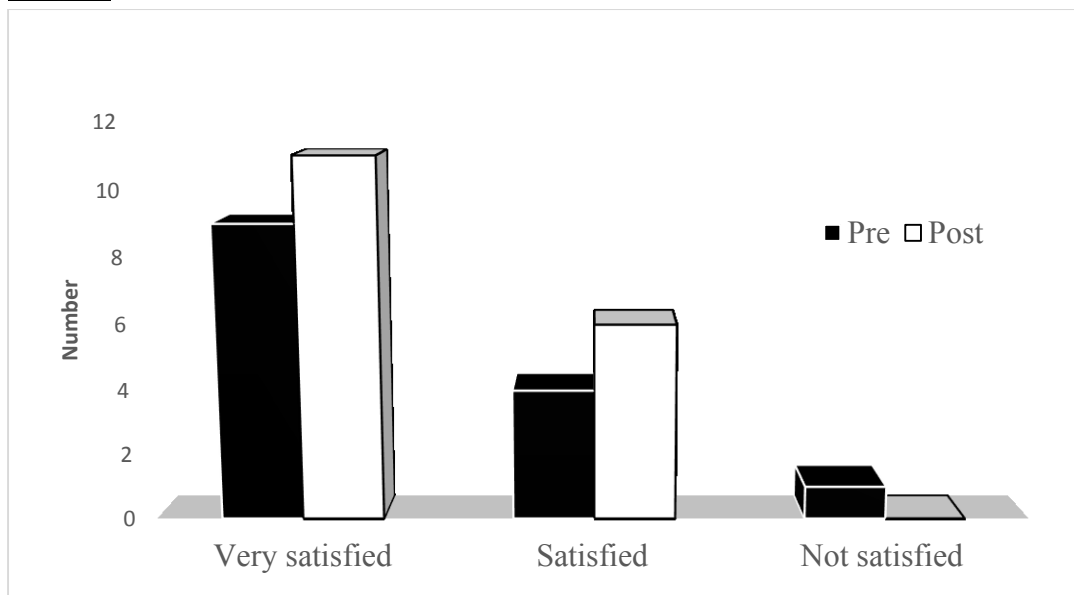


Fig. 5: Satisfaction of Pre and Post Testing

Figure 5 shows that the mean of the post-test of the experimental group was significantly higher than its pre-test in each criterion of experiment. The data reveals that there was significant difference in the score of pre-test and post-test. This shows that test-teach-test method remained effective in computer science undergraduate of the students.

4. Discussion

The TTT method is also applied in several lectures and after such lessons, in this study we have collected the feedback in the form of a Questionnaire. Test - Teach - Test approach for teaching approach is basically used in language teaching but can be effectively use in many other fields. It is said that this approach can also use with skill-based learning subjects like science, mathematics, IT etc. The method is appropriate when you have a new group of students whose skills are unidentified so that you need to get some idea about the student's skills and abilities over the subject. This approach can also be better if you are going to start a new lesson. The best practice is to associate lesson plans with this approach where you plan how to do testing, teaching and then testing again.

Regarding teaching methods, in general, the results of the survey indicate that while a simple majority of the students support the traditional teaching method of 'the lecture', they also give a substantial degree of support to the use of participatory methods of teaching. This tends to support the authors' view that it is best to use the traditional teaching method of 'the lecture' in combination with participatory teaching methods such as TTT methods and 'group discussion'. From among the participatory teaching methods the highest level of support by the surveyed students was given to 'discussion', 'educational visits' and 'question and answer', while others such as 'group discussion' and 'brainstorming' also received a high degree of support. Overall the survey results offer firm support for the use of participatory teaching methods which is used in this study as TTT to improve student learning. The general premise of this brief position paper has been that a student-centric teaching approach that also takes students' needs, emotions, and need to engage in the 'teaching' process into account would enhance the existing Sri Lankan Computer Science degree programmes as an experience.

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