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Toward New Vision in Teaching Calculus

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Abstract

Usually the first course in mathematics is calculus. It's a core course in the curriculum of the Business, Engineering and the Sciences. However many students face difficulties to learn calculus. These difficulties are often caused by the prior fear of mathematics. The students today can't live without using computer technology. The uses of computer for teaching and learning can transform the boring traditional methodology of teach to more active and attractive method. In this paper, we will show how we can use Excel in teaching calculus to improve our students' learning and understanding through different types of applications ranging from Business to Engineering. The effectiveness of the proposed methodology was tested on a random sample of 45 students from different majors over a period of two semesters.

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1. Introduction

Teaching methods can best be defined as the types of principles and methods used for instruction. There exist different types of teaching methodologies based on the type of information or expertise the instructor is trying to deliver. Power point presentation, class discussion, problem-solving, and memorization are some of the teaching methods being used. When an instructor is choosing a teaching method, he/she needs to adapt

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their style according to their students. The efficiency of the teaching methods is the major factor to lead the student to succeed [1]. The computer technology is widely used by students and it's become an important part of their daily life. In this paper, we will propose a new visual methodology for teaching instead of the traditional and passive methodology by using computer. We will use Microsoft office excel software to teach calculus course, calculus is a major course for many majors. The experimental test shows the efficient of the propose method. This paper is organized as follows. Section 2 introduces Microsoft Office Excel. Section 3 gives an overview of the existing teaching methods. In the section 4, we will illustrate the using of excel through varieties of calculus topics ranging from business, engineering and sciences. The experimental test and its result are discussed in section 5 and finally the conclusion and the perspective are given in section 6.

2. Why Microsoft Office Excel

Microsoft office is very essential packages for any computers. Excel is a part of this package. Excel is electronic spread sheet software, that end user use to store and structure their data in a tabular form. By using the spread sheet, we can do any arithmetic application and use a huge set of mathematics built in function in addition to build our formula [7]. It features calculation, draw graphics, create formulas, and solve equations and many mathematical functions. The usage of excel is easy and straightforward. The recent versions of Excel are 2008 for Mac and 2010 for Windows.

3. Teaching Methods in Education

For effective teaching to take place, a good method must be adopted by a teacher. In this section we will describe briefly some of well-known teaching methods such as the lecture method, the cooperative method, the demonstration method, the discussion method, and finally computer-based method [2, 7].

Lecture Method

The traditional and broadly used method is the lecture method. Lecture method takes the form of presentation. The instructors should know how to organize and present the lecture. Moreover, they must understand the drawbacks and the advantages of this method. This method is used to introduce new topics, present graphical subjects, summarize ideas, present coding, and display the main points of the lecture, showing the relation between the theory and the practice. To add some interactivity, we can combine the lecture method with other teaching methods like the discussion method.

Cooperative Method

An attractive strategy of teaching is to have the students working together in groups during the session. This is the concept of the cooperative method. Several researches on this method indicate: the increasing of their participation, improve their communication, augmenting their knowledge, encouraging their development of the social skill, increasing their independence and simply facilitates their effective learning. In a cooperative method, one classroom may share by more than one instructor and these instructors will share all responsibility including managing groups, planning, coaching, tutoring and grading. In this method, it's important to take into consideration the subsequent points: the size of each group, the selection and the distribution of each task and the choice of each student in its appropriate group.

Demonstration Method

The concept of this method is "learning by doing". This method of teaching supplies the students a comprehensible image of the subject that must be learned. This method is suitable for teaching a skill because it covers all the necessary steps in an effective learning order. It refers to the capability of students to improve their skills by regularly repeating the same type of action. An individual learns to calculate by calculating, to write by writing, to swim by swimming, and to drive by driving. This method allows the students to relate the principles and theories to a practical situation. This method is more relies on the student and consequences of an effective student participation and involvement than any other teaching method. The demonstration method

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