A study in higher education calculus and students' learning styles


Abstract

This research is devoted to focussing on the influence of different learning style on the performance of undergraduate students in various parts of calculus. In carrying out the study, calculus materials were classified into four main categories (Z4,Z5,Z6,Cals) and, for the Iranian students, the results of their mathematical performance in the university entrance examination is labelled (En) to identify their grounding in high school mathematics at the beginning of the calculus course in higher education. Also, in the present study, students' performance (weakness) in the manipulation of mathematical notation and logical discussion is called (Z1) category and (Cal) indicates students' total achievement in calculus examination which is, in fact, the students' performance on the combination of the categories (Z4,Z5,Z6). These calculus categories are described in Chapter 5. However in short term, multi-conceptual and procedural tasks are classified as (Z4). The (Z5) category is defined as the translation processes between mathematical abstraction (analytic/symbolic) and (pictorial/visual) forms of calculus materials. Moreover, multi-skilled, transferable and procedural skills are labelled as (Z6) category. It should be noted that these categories are interrelated in a scheme to exhibit activities in calculus.

572 students participated in the experimental part of this study and were selected from two Iranian universities (Sabzvar University and Mashhad University) and Glasgow University in Scotland, U.K.

During the period of the study, the samples of students were subjected to some psychological tests in order to assign their Field-dependent/Field-independent and Convergent/Divergent learning styles.

It was found throughout the study that the most effective combination of learning styles which emerged from the interacting picture of all the psychological factors used in the research, were field-independent/convergent (FI-Con) in Iran, and field-independent/divergent (FI-Div) in Scotland in performing on the calculus. On the other hand, the combination of field-dependent and convergent styles (FD-Con) could lessen achievement in calculus by mathematics/physics students, and field-dependent and divergent styles (FD-Div) would lessen attainment in calculus by engineering students.

In addition, when the mean scores in calculus categories were calculated for various groups of students with different learning styles, the convergent thinkers (Con) was found to be best in (Z6), while divergent thinkers (Div) exhibited higher performance in (Z5). These findings demonstrate that the Con/Div way of thinking is the most effective in influencing performance in different areas of calculus, the FI/FD factor takes the second position. All these findings have been combined to form a model which emerges at the end of this thesis.

Moreover, in Chapters 3 and 4, a comparison is made between calculus in secondary (high school) and higher education in Iran and Scotland, focussing on content, teaching order, learning objectives and teaching methods.

My Smart Borrowing. Main Content. What's Your Learning Style? The Learning Styles.


If you are an auditory learner, you learn by hearing and listening. You understand and remember things you have heard. You store information by the way it sounds, and you have an easier time understanding spoken instructions than written ones. You often learn by reading out loud because you have to hear it or speak it in order to know it. As an auditory learner, you probably hum or talk to yourself or others if you become bored. People may think you are not paying attention, even though you may be hearing and understanding everything being said. Alamolhodaei, H. (1996). A study in higher education calculus and students' learning styles. Unpublished Ph.D. Thesis, University of Glasgow. Anastasas, A. (1996). Spatial training for calculus students: Sex differences in achievement and in visualization ability. Journal for Research in Mathematics Education, 18(2), 126-140. Mundy, J. F. & Lauten, D. (1994). Each person has different learning preferences and styles that benefit them. Discover your unique learning style and improve your study skills. There has been a big push in education in recent years on how teachers can better meet the needs of the students, and a very effective way to do that is to learn about different learning styles. The more teachers understand their students and the way their brains work, the better they can be at helping them learn.