The United States of America has dropped behind many countries in terms of the Science and Engineering university degrees awarded since the beginning of the nineties. Multiple studies have been conducted to determine the cause of this decline in degrees awarded, and try to reverse the trend in US education. The goal of these studies was to determine the proper instructional methods that facilitate the knowledge acquisition process for the student. It has been determined that not one method works for all types of curriculum, for example methods that have been found to work effectively in curriculum that teaches procedures and physical systems often fail in curriculum that teaches abstract and conceptual content. The purpose of this study is to design an instructional method that facilitates teaching of abstract knowledge, and to demonstrate its effectiveness through empirical research.

An experiment including 72 undergraduate students was conducted to determine the best method of acquiring abstract knowledge. All students were presented with the same abstract knowledge but presented in different types of organization. These organization types consisted of hierarchy referred as Bottom Up, Top Down, and Unorganized. Another factor that was also introduced is Graphing, which is a method that is believe to improve the learning process. The experiment was completed in 8 weeks and data was gathered and analyzed. The results strongly suggest that abstract knowledge acquisition is greatly improved when the knowledge is presented in a Bottom Up hierarchical fashion. On the other hand, neither Graphing nor the Top Down or Unorganized conditions affect learning in these novice students.

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The public is welcome to attend.