

**THE EFFECTS OF LANGUAGE ON STUDENTS' FCI  
PERFORMANCE**

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## **ABSTRACT**

### **THE EFFECTS OF LANGUAGE ON STUDENTS' FCI PERFORMANCE**

This study sought to identify the level of students' conceptual understanding in Newtonian Mechanics and the effect of different language versions of the instrument that measure this understanding. The instrument used in this research is the Force Concept Inventory (FCI): the English and the Malay versions. The subjects of the study consisted of 100 students from Universiti Teknologi Mara (UiTM) who enrolled in two physics courses in the Faculty of Applied Science. Forty nine students answered the Malay version of the FCI while another fifty one answered the English version. The FCI was used to assess students' understanding of the concept in mechanics and to investigate the common and recurring misconceptions. At the same time, it is also used to probe the effect of different language versions of the FCI upon students FCI performance.

The collected data obtained was analyzed by using statistical methods with the help of Excel and SPSS programmes. This method compares the percentages of correct answers to each item in the FCI between the students answering the English and the Malay version of the FCI. These results are then compared to the results of students from other countries, specifically from Petroleum Institute. From this study, students' level of understanding in Newtonian mechanics had been ascertained and the effects of different language versions of the FCI upon student scores had been identified. We conclude that, the average percentages of correct answers for both versions were similar. However, UiTM students performed slightly better in the English version of FCI compared to the Malay version by item per item analysis. The pattern of performance between the UiTM and Petroleum Institute students are found to be slightly similar.

## CHAPTER 1

### INTRODUCTION

#### 1.1 Background and problem statement

Physics is the study of matter and energy interactions and is the most fundamental of the natural sciences. Understanding the concepts and being able to apply it are the keys to success in learning physics because these are the basic steps in continuous physics learning. Physics depends completely on these two aspects as stated by Zawajer Hj Abd Ghani (2001) in her research on Understanding the Concept of Mechanics among A-Level Physics Students through her introduction below,

*“Physics teaching relies heavily on the understanding and application of physical laws and concepts. For students and teacher alike, these laws and concepts act as staging posts in the arduous journey through the syllabus.”*

(Zawajer, 2001)

Students always face difficulties when it comes to understanding the theory in physics, making the physics education researchers eager to study on what happen as students struggle to grasp and use the concepts of physics. This led to the research on students' conceptual understanding in learning physics. Many