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Investigation of First Year University Students' Interpretation of Graphs in Mathematics and Kinematics

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Mathematics is an essential tool in studying physics, i.e., it will be difficult to study Physics without the sound basics of Mathematics. It is even called the “language of physics” (Redish, 2005). Physicists blend conceptual physics with mathematical skills and use them to solve and interpret equations and graphs. For instance, in kinematics, different aspects from mathematics such as knowledge of functions and the solving of equations are combined with physics concepts. Many introductory physics students perform poorly on the use of mathematical skills and interpretations of graphs in physics. Two possible reasons may be: (1) Students lack the necessary mathematical skills needed to solve the physics problems and (2) Students do not know how to apply and relate their mathematical skills in the context of physics. These possible reasons were investigated in a Masters Research project which is still in progress, which probed first year university students' interpretations of graphs in kinematics and in mathematics. This paper will use the idea of Beichner's standardized questionnaire on kinematic graphs. From this questionnaire, an equivalent questionnaire was devised in the context of Mathematical equations and graphs. The results of the investigation tend to indicate the deficiencies in the students' mathematical conceptual knowledge as well as in the transfer of mathematical skills that they possess to solve kinematic equations and graphs.

Level (Hons, MSc, PhD, other)?

MSc

Consider for a student award (Yes / No)?

Yes

Would you like to
 submit a short paper
 for the Conference
 Proceedings (Yes / No)?

Yes

Primary author: Mr PHAGE, Itumeleng (Honorary)

Co-author: Dr LEMMER, Miriam (member)

Presenter: Mr PHAGE, Itumeleng (Honorary)

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