Contribution ID: **212** Type: **Oral Presentation**

A Case for Physics Content Knowledge and Modeling Pedagogy for Natural Science Teachers

Thursday, 11 July 2019 10:20 (20 minutes)

Negative experiences by learners at the gateway phase (grade 9 to grade 10) due to perceived uninteresting content in natural sciences or poor teaching on the part of the teachers has a detrimental effect on learners. There is evidence that many Natural Science teachers are not trained in the physics content component of the subject, Hestenes, Megowan-Romanowicz, Popp et al (2011), Chisholm (2012). This has been identified as the major factor affecting learners' achievement and interest in the sciences and thus, deterring learners from having further interest in physical sciences in the senior high school phase. Also, the curriculum structures play an important role as teachers enact their understanding of what is to be taught, and what is to be learned. The study of Natural Sciences in our high schools is a basic-foundation subject for learners who would be going on to do Physical Sciences as a matric subject. This paper focuses on the effect of a Modeling Instruction approach on Pre-Service Teachers' conceptual understanding of electricity in a PGCE science module. The modeling approach is the teaching whereby a small number of key models of the physics component are explicitly focused on and developed based on inquiry methodology, Hestenes et al (2011), Barlow, Frick, Barker, and Phelps (2014). The following questions were asked; What are the demographics of the Pre-Service teachers and the implications for the teaching of Natural Sciences? What is the effect of modeling instruction approach on teacher test scores? An analysis of test scores and a survey of teacher experience was also carried out. The results of the analysis are discussed. The findings of the study shows there is positive outcomes for modelling instruction as a strategy for teaching physics content of Natural Science to Pre-Service Teachers. The researchers recommend the use of modeling instruction for teaching the physics contents of Natural Sciences to help learners learn science better and to see the usefulness of the subject at the Junior High School level.

Apply to be
 considered for a student
   award (Yes / No)?

Yes

Level for award
 (Hons, MSc,
   PhD, N/A)?

PhD

Primary author: Mr AUDU, Bako Nyikun (University of the Western Cape)

Co-author: Dr HERBERT, Mark (University of the Western Cape)

Presenters: Mr AUDU, Bako Nyikun (University of the Western Cape); Dr HERBERT, Mark (University of the Western Cape)

Session Classification: Physics Education

Track Classification: Track E - Physics Education