Contribution ID: **149** Type: **Poster Presentation**

Physics teaching and learning: A case for Indigenous Knowledge in Physics

Tuesday, 2 October 2018 17:53 (1 minute)

mThe goal of this conceptualization is to explore how physics educators can integrate indigenous knowledge into their teaching of physics concepts in the science classroom whether at the secondary or tertiary level of education. The facts remains that African history has constantly affirmed the existence of the knowledge of physical sciences among indigenous people of African origin wherever they found themselves. This knowledge, indigenous knowledge, has sustained African indigenous people for centuries, even before the adventure of Europeans on the African soil. Evident in history of recent past are the use of physics concepts by indigenous people of Africa; such concepts as the use of levers to move heavy object, the smelting of ores, the understanding of the cosmos, the stars, the phases of the moon, the sun, the solstices and the seasons and the interconnectedness of the heavenly bodies and natural phenomena and the concept of time. The question is why has Eurocentric science ignored and continue to ignore the roles of indigenous knowledge in the field of physics and its education? Why has indigenous physics and physics concepts not been part of the physics curriculum, especially, in Africa schools? Why have physics teachers continually neglect to include indigenous knowledge in their teaching of physics? In this conference, physics teachers and academic staff members will be challenged and engaged in articulating how indigenous knowledge can be used in the teaching and learning of physics concepts in the science classroom. The post-apartheid school curriculum (NCS, 2005 and CAPS, 2011) have mandated that in teaching the science, (including physics), teachers must incorporate indigenous knowledge so that the 300 years of such knowledge existing within the indigenous community, in South Africa, and by extension, Africa be not lost, despite the marginalization of indigenous knowledge by westernized science. Also, in the wake of the clarion calls to decolonize the university curriculum including the teaching and learning of sciences, physics included, in the midst of the often hostile culture of science, it is imperative that the teaching of the sciences, including physics must as of necessity must be transformed. Without that, the success/pass rates of learners will continue to be low. It has been established in the literature that students' cultural beliefs affect the ways they learn.

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N/A

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Session Classification: Poster Session

Track Classification: Track H - Teacher Education and Training in Physics