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Impact of Ethnoscience-Based Teaching Approach: Thinking Relevance, Effectiveness and Learner Retention in Physics Concepts of Optics

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Abstract : Physics learners' poor retention, which culminates in poor achievement due to teaching approaches that are unrelated to learners' in non-Western cultures, warranted the study. The tenet of this study was to determine the effectiveness of the ethnoscience-based teaching (EBT) approach on learners' retention in the Physics concept of Optics in the Awka Education zone of Anambra State- Nigeria. Two research questions and three null hypotheses tested at a 0.05 level of significance guided the study. The design adopted for the study was Quasi-experimental. Specifically, a non-equivalent control group design was adopted. The population for the study was 4,825 SS2 Physics learners in the zone. 160 SS2 learners were sampled using purposive and random sampling. The experimental group was taught rectilinear propagation of light (RPL) using the EBT approach, while the control group was taught the same topic using the lecture method. The instrument for data collection was the 50 Physics Retention Test (PRT) which was validated by three experts and tested for reliability using Kuder-Richardson's formula-20, which yielded coefficients of 0.81. The data were analysed using mean, standard deviation and analysis of co-variance ($p < .05$). The results showed higher retention for the use of the EBT approach than the lecture method, while there was no significant gender-based factor in the learners' retention in Physics. It was recommended that the EBT approach, which bridged the gender gap in Physics retention, be adopted in secondary school teaching and learning since it could transform science teaching, enhance learners' construction of new science concepts based on their existing knowledge and bridge the gap between Western science and learners' worldviews.

Keywords : Ethnoscience-based teaching, optics, rectilinear propagation of light, retention
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