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Effect of guided inquiry laboratory activities on first-year physics students' views on the nature of science.

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Abstract content
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This study investigated the effect of reform-based Physics practical activities on students' views on the nature of science (NOS). The reform-based practical activities adopted a guided inquiry-based approach combined with guiding reflective questions. Seventy first-year Bachelor of Science physics students participated in this study at a well-established South African university, which compared guided inquiry and traditional recipe-based laboratory approaches. The students were divided randomly in a control group that did traditional recipe-based practicals and an experimental group, that did guided inquiry-based practical activities. Both groups had the same reflective questions on an aspect of the NOS at the end of the practical activities. At the end of the practical course, data were collected using the VNOS-form C questionnaire and follow-up focus group interviews were conducted. Additionally, there was also a practical test that consisted of both a hands-on and a written section. The results showed that students developed better understanding of the three aspects of NOS: tentative, empirical and difference between observations and inferences. However, students' conceptions on the difference between theory and law, role of imagination and creativity, influence of social and cultural values and notion of using universal scientific method in the development of knowledge remain unchanged. This study demonstrated that there is significant effect of guided scientific inquiry-based laboratory practical activities on the students' conceptions of NOS in first-year physics course than traditional laboratory approach.

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