

The Effect of Using Computer Simulations in Teaching Chemical Bonding: Experiences with Ugandan Learners

John Sentongo¹, Robert Kyakulaga¹ and Israel Kibirige^{2*}

*¹Makerere University, Department of Science and Technology Education (DOSATE)
P.O. Box 7062, Kampala, Uganda*

*²University of Limpopo, Department of Mathematics, Science and Technology Education
(DMSTE), P/Bag X 1106, SOVENGA, South Africa, 0727*

KEYWORDS Chemical Bonding. Computer Simulated Activities. Traditional Teaching. Performance

ABSTRACT Computer simulations are well documented in developed countries but little is known about them in developing countries. The objectives of the study were to examine the effect of using computer simulations in addition to hands-on (manual) laboratory activities when teaching chemical bonding and to compare the results with those of learners who were taught using hands-on (manual) laboratory activities only. Two senior three classes participated in the study: 58 learners in an experimental group (EG) and 57 in a control group (CG). Data from achievement tests were analysed using descriptive and inferential statistics, while data from interview schedules were thematically analysed. The results indicated that learners had little knowledge about chemical bonding. The EG performed better than the CG in the post-test (ANCOVA, $p < 0.05$). This suggests that computer simulations provide feedback that minimises abstractness. Also, there were no differences between achievements of the boys and girls in the EG ($U = 3.0.5$, $P < 0.05$), suggesting that computer simulations do not discriminate against gender.