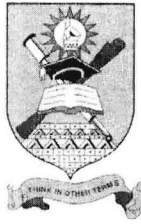


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NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

**FACULTY OF APPLIED SCIENCES
DEPARTMENT OF COMPUTER SCIENCE
MSc. INFORMATION SYSTEMS**

**AN INVESTIGATION INTO THE USE OF THE VIRTUAL CLASSROOM FOR SCIENCE,
TECHNOLOGY, ENGINEERING AND MATHEMATICS EDUCATION IN ZIMBABWE**

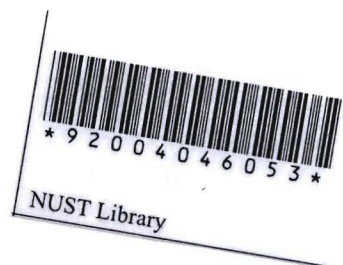
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SUPERVISOR

MRS. S. MOYO

A proposal submitted in partial fulfilment of the requirement for the Degree of Master's in Information Systems

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Abstract

This dissertation looked into the use of virtualized laboratories as a substitute to more expensive hands-on laboratories. This would be of great importance to the Ministries of Higher and Tertiary Education as well as Primary and Secondary Education if found to be worth pursuing. The study was conducted with the Hilbright Science College student at Form, 1, 2, 3, 5 and 6. The study adapted the quasi-experimental approach where students at Eastlea were employed as the experiment group while the students at Avondale campus were engaged as the control group. There were all in all 188 students who participated. The study also involved collecting data through structured interviews with experts from the University of Bindura and the Ministry of Education experts who were involved in STEM and Psychomotor programme implementation. The study with students involved pre-test and post-test and a take-home laboratory experiment task for assessment of scientific inquiry skills. The control group used hands-on experiment while the experiment group used the on line tools from <https://phet.colorado.edu/en/simulations/category/physics> that are java applets that simulate a virtual lab experiment. The learners were directed to investigate the changes in and current voltage across two components and derive the relationship among the variables the way scientists would do to discover a theory. The learners were then given a survey form to fill to identify their experiences with the method they used. From the experiment it was found that Form 1, 2, 3 5, and 6 showed that the experiment group did better in practical task using virtualized experiment than the hands-on control group. However in theoretical test the lower classes form 1, 2 and 3 showed results that on average supported that the virtual experimentation was as good as the hand-on experiment if not better. However the higher classes the Form 5, and form 6 in particular were not conclusive. The form 5 showed no significant change while the Form 6 went the opposite way to show that the control group performance improved far more than the experiment group. However, the Form 5 and 6 students are doing physics most of them and have different teachers in their A level classes, thus depending on which topic they were may have influenced the results in favour of one group.