

**PERCEPTIONS OF VIRTUAL LABORATORIES AND ATTITUDES TOWARD
CHEMISTRY AMONG JAMAICAN GRADE 10 STUDENTS**

A Research Project

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ABSTRACT

PERCEPTION OF VIRTUAL LABORATORIES AND ATTITUDES TOWARDS CHEMISTRY AMONG JAMAICAN GRADE 10 STUDENTS

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This study presents findings of 124 Grade 10 students' perceptions of Virtual Laboratories and its relationship with their attitudes towards Chemistry using a multi-method quantitative design. The multi-method design is a sequential design, which involved a quantitative survey in Phase one, followed by an intervention using Virtual Laboratories in the second phase. Two adapted survey instruments (The Perceptions to Virtual Laboratories and Attitudes towards Chemistry) were administered to 124 Grade 10 Chemistry students (M =42, F=81). Most respondents of the students had a modest attitude to Chemistry (83.9%). Although most respondents found the classes boring (86.3%), most of the respondents considered Chemistry to be valuable and perceived that the skills learnt in Chemistry will be important for their future (77.4%). There was a significant and large effect for interest in Chemistry and learning. Chemistry ($F(2,122) = 6.74$, $p < .05$, eta squared = .10). 43.5% had a high perception of Virtual Laboratories, where 58.9% perceived that Virtual laboratories would help them to be confident in recognizing laboratory equipment. Spearman's rho correlation results showed that there was a low positive correlation ($r = .22$, $p < 0.05$) between students' perception of virtual laboratories and their attitudes toward Chemistry, which was significant. In Phase 2 of the study, a sample size of 15 consenting students from the 125 participants and their teachers were trained and performed two to four

Chemistry laboratory exercises using the CoreSciences Learning platform. These students then completed the Perceptions to Virtual Laboratories and Attitudes towards Chemistry instruments at the end of the intervention as a post test. The students' pre-test scores and post test scores were matched. A Wilcoxon matched-pairs signed-ranks test showed that there was no significant difference ($Z = -.491, p > .05$) between students' Attitude to Chemistry scores before and after they participated in using virtual laboratories. t test results showed that there was a significant difference ($Z = -2.069, p < .05$) between the scores of students' Perception of Virtual Laboratories ($N=15$) before and after the intervention. The effect size was calculated to be .55, which is a modest effect, which suggested that there was a notable shift in students' perceptions of virtual laboratories after the intervention. The findings imply that there is merit in using virtual laboratories in teaching Chemistry, however, students' attitudes to Chemistry needs further exploration.

Reference:

CoreSciences is an online science learning platform for GCSE science focused on the Required Practicals element of the GCSE syllabus. www.coresciences.co.uk