The College of Graduate Studies and the College of Education Cordially Invite You to a

PhD Dissertation Defense

Entitled

IMPACT OF COMPUTER SIMULATIONS ON UAE STUDENTS' LEARNING OF NEWTON'S SECOND LAW OF MOTION AND ATTITUDES TOWARD PHYSICS WITHIN THE CONTEXT OF SCIENTIFIC INQUIRY

by

Khaleel Shehadeh Ali Alarabi

Faculty Advisor

Prof. Hassan Tairab, Curriculum & Methods of Instruction Department

College of Education

Date & Venue

4:00 PM

Monday, 19 April 2021

Blackboard Collaborate Ultra Link:

https://eu.bbcollab.com/guest/b33b9cb476d64fdb8e37addb87409281

Abstract

Unlike traditional instructional strategies, computer simulations (CSs) have lately been receiving increasing attention and applications within the international physics education community. This study aims to investigate the impact of CSs on UAE grade 11 students' performance in Newton's Second Law of Motion (NSLOM) within the context of scientific inquiry instructions. The study also investigates the effects of using of CSs on students' attitudes toward Scientific Inquiry (ASI), Enjoyment of Science Lessons (ESL), and Career Interest in Science/physics (CIS). The study employed a pre-test and post-test quasi-experimental design involving four equally-distributed grade 11 Physics classes: two as experimental groups (students studying under scientific inquiry instructions), and the other two as control groups (students studying under traditional face-to-face instructions). Two instruments were developed to collect data: (1) The Newton's Second Law of Motion Achievement Test (NSLMAT), and (2) The Test of Science-Related Attitudes (TOSRA). Overall, results suggested that, in comparison with face-to-face instruction, CSs were more successful in promoting students understanding of NSLOM topics. Results revealed that CSs-based instruction highly impacted the attitudes towards ASI, ESL and CIS. Finally, it is suggested that if properly designed, CSs-based instruction within the context of scientific inquiry can greatly improve student learning of NSLOM.

Keywords: Computer Simulations, Newton's Second Law of Motion, Inquiry-based Learning, Scientific Attitude, Conceptual Understanding, Procedural Understanding, UAE, High School Students, Physics Education.