

**EFFECTS OF INFORMATION TECHNOLOGY-INTEGRATED
TEACHING STRATEGIES ON SECONDARY SCHOOL CHEMISTRY
STUDENTS' LEARNING OUTCOMES IN LAGOS STATE, NIGERIA**

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DEDICATION

To God Almighty, the Giver of life, the All Sufficient, the Sovereign God.

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To my mother-in-law; Mrs. Abigail Fehintola Ojo. You are not just a mother-in-law but a mother in love.

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Abstract

Chemistry students encounter difficulties learning the subject is confirmed by many studies and these learning difficulties have labelled some topics difficult. These learning difficulties may be attributed to the methods of teaching often employed by the teachers. It is against this background this study investigated the effectiveness of integrating Information Technology (IT) into commonly employed teaching method (Teacher Demonstration) and recommended Guided Discovery (GD)) on four students' learning outcomes in some difficult topics (Mole Concept, Chemical Kinetics, Electrolysis and Oxidation and Reduction Reactions) in senior secondary (SS) chemistry. The study involved 446 (264 male, 182 female) SS 2 chemistry students from 12 schools purposively selected from two Education Districts (II and III) in Lagos State, Nigeria. Using a 4×2×2 pre-test post-test non-equivalent control group quasi experimental research design, the study examined the main effects of the treatments, school type and gender and the interaction effects of the variables on chemistry students' conceptual understanding, problem-solving skills, acquisition of science process skills and acquisition of 21st century skills. Four major instruments: Chemistry Conceptual Understanding Test (CCUT), Problem-solving Skills Test (PSST), Science Process Skills Test (SPST) and 21st Century Skills Test (21st CST) were used to collect data. Data were analysed using descriptive statistics and analysis of covariance (ANCOVA). Bonferoni post-hoc analysis was used to verify the direction of significant difference where it existed. Results showed that IT-integrated Guided Discovery was the most effective for all the learning outcomes. There were significant main effects of ITD, IGD, on chemistry students' learning outcomes. There was significant main effect of school type on chemistry students' conceptual understanding and science process skills but no significant effect of school type was found on chemistry students' problem-solving skills and 21st century skills. There was no significant influence of gender on any of the learning outcome. Findings also revealed significant interaction effects of treatment (ITD and IGD) and school type on chemistry students' conceptual understanding, science process skills and 21st century skills. No significant interaction effect of treatment and gender; school type and gender; treatment, school type and gender on the four chemistry students' learning outcomes. From the findings, integration of IT into those teaching strategies is highly recommended for teaching of chemistry in secondary schools for better academic achievement in chemistry. Also, if government will adequately equip public schools with teaching learning resources, public school students would perform better than their counterparts in private schools.

Keywords: Difficult Topics, IT-integration, Guided Discovery, Teacher Demonstration, and Learning Outcomes.

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