# EFFECTS OF INTEGRATED COMPUTER ASSISTED INSTRUCTION ON STUDENTS' ACADEMIC ACHIEVEMENT IN CHEMISTRY IN SECONDARY SCHOOLS OF GATUNDU NORTH SUB-COUNTY, KENYA

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## DECLARATION

I confirm that this research thesis is my original work and has not been presented in any other university/institution for certification. This thesis has been complemented by referenced works duly acknowledged. Where text, data, graphs and tables have been borrowed from other works- including internet, the sources are specifically accredited through referencing in accordance with anti-plagiarism regulations.

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We confirm that the work reported in this thesis was carried out by the candidate under our supervision as university supervisors

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# ABSTRACT

The problem addressed in this study was poor performance in Chemistry at KCSE level. The specific gap addressed was the nature of Chemistry where many of the concepts, theories, laws and principles are abstract, difficult to visualise and therefore difficult to understand leading to poor performance by students in Chemistry. The study sought to find out, if integration of Computer Assisted Instruction (CAI) would help to concretize such abstract concepts, make them more real, leading to better understanding, hence better performance in Chemistry. A topic in Chemistry "Structure and Bonding" was used in the study because it is abstract. An experimental design was used whereby experimental group was exposed to Computer Assisted Instruction (CAI), while control group was taught using Conventional Instructional Technique (CIT) only. The target population was 2,060 form two students in 30 secondary schools within Gatundu North sub-county in Kiambu County. Sample size was 230 students from six secondary schools purposively selected to have schools with computers for instructions. To have relative uniform samples, schools with close mean grades in Chemistry at KCSE were used and for gender-based comparison, all the schools used were mixed boys' and girls' day schools. The study had four objectives. These were: To find out if integration of Computer Assisted Instruction (CAI) influenced students' academic achievement in Chemistry as compared to Conventional Instructional Technique (CIT). To find out if there is significant difference in performance when integrated (CAI) is applied in teaching Ionic Bonding compared to when (CIT) is used. To find out if there is influence of integration of (CAI) on academic performance of students in Covalent Bonding compared to when (CIT) is used. Compare performance of boys to that of girls in Chemistry when (CAI) is integrated and when (CIT) is used. Piloting was done in a different school from the sampled schools. This was done to test the instruments for validity and reliability. Data was collected using two instruments; Pre-test and Post-test. Pre-test instrument was administered to both control and experimental groups before treatment. Post-test instrument was administered to both groups after the treatment of samples. Data collected was analysed descriptively using frequencies and percentages. The mean marks were compared using Chi-square and Pearson paired t-test to establish if there was significant difference. Microsoft Excel 2010 and Statistical Package for Social Sciences (SPSS 11.5 for Windows) were used as tools for analysis. Results of analysis of pre-test indicated that both control and experimental groups had equivalent performance before treatment. The performance of learners in post-test indicated that experimental group had better results than control group, meaning that CAI had positive influence on learners' performance. On gender, both boys and girls did better with integration of CAI. However, boys did better than girls did. The experimental group performed better in Ionic Bonding and also in Covalent Bonding than the Control group. Therefore, integration of CAI had positive effect on learning of Chemistry. The study recommended integration of CAI in Schools, Implementation of ICT policies in education that are already in existence.