CHAPTER FIVE

Summary, Conclusion and Recommendations

Summary

This study investigated the effect of technology-integrated teaching on students' conceptual understanding of chemistry in selected secondary schools in Ilorin, Kwara State, Nigeria. The survey research design was adopted, involving 100 Senior Secondary School (SSS I & II) chemistry students selected through purposive and stratified random sampling. Data were collected using the Student Attitude and Engagement Questionnaire (SAEQ), which covered students' attitudes, engagement, perception, and challenges associated with technology-based instruction.

Findings from the analysis revealed that:

1. Students taught with technology-integrated instruction demonstrated improved conceptual understanding of chemistry compared to traditional methods.

2. Digital tools such as animations, video lessons, virtual laboratories, and educational games significantly enhanced students' learning experience.

3. Students exhibited a positive perception of technology use in the classroom, noting increased motivation, engagement, and interest in chemistry.

4. Despite these benefits, several challenges constrained the effective integration of technology in schools. These included poor internet access, lack of devices, inadequate electricity supply, and limited teacher competence in digital instruction.

Conclusion

The integration of technology into chemistry instruction proved effective in enhancing students' conceptual understanding, engagement, and overall perception of the subject. Technology-based methods, when applied effectively, make abstract chemistry concepts clearer, improve problem-solving ability, and promote learner-centered instruction.

However, infrastructural challenges such as unreliable electricity and internet, as well as inadequate teacher training, continue to hinder the full potential of technology in Nigerian classrooms. The study concludes that while technology integration offers significant opportunities to transform science education, sustainable investment in digital infrastructure and teacher capacity-building is necessary to maximize its impact.

5.3 Recommendations

Based on the findings of this study, the following recommendations are made:

1. Provision of Infrastructure:

Government and school authorities should provide reliable electricity, affordable internet connectivity, and adequate digital devices to support technology-driven instruction.

2. Capacity Building for Teachers:

Regular training workshops should be organized for teachers on the effective use of digital tools, virtual laboratories, and e-learning platforms in chemistry education.

3. Curriculum Integration:

The curriculum should formally integrate technology-based instructional strategies, ensuring that digital learning complements traditional classroom methods.

4. Public-Private Partnerships:

Schools should partner with private organizations, NGOs, and tech companies to support the acquisition of digital tools, software, and learning platforms.

5. Student Digital Literacy:

Schools should introduce basic digital literacy programs to ensure that students can effectively use online resources, simulations, and other e-learning tools.

6. Addressing Equity Issues:

Special interventions should be made to support students from disadvantaged backgrounds to access digital devices and resources, so as not to widen educational inequality.

Suggestions for Further Research

Future research may explore:

1. Comparative studies of technology integration across different subjects (e.g., physics, biology, mathematics).

2. Longitudinal studies to examine the long-term effect of technology-based instruction on students' academic performance.

3. The role of teacher attitudes and digital competence in the effective integration of technology in secondary school science education.

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