Pre-service Physical Science Teachers' Difficulties, Experiences, and Attitudes Towards Online Learning of Reaction Mechanisms in Organic Chemistry

Elaosi Vhurumuku *
Associate Professor, School of Education, University of Witwatersrand, P.B. 2050, Wits, South Africa

Abstract:

In Teacher Education, the transition to online learning environments presents unique challenges, especially in the teaching of complex subjects such as organic chemistry. This study investigates the difficulties, experiences, and attitudes of pre-service physical science teachers towards learning reaction mechanisms in organic chemistry through online platforms. Utilizing a mixed-methods approach, data were collected from 148 pre-service teachers enrolled in a third-year Physical Sciences course, as part of a Bachelor of Education in teaching, degree programme. Quantitative data were gathered via Likert-type questionnaires, while qualitative insights were obtained through open-ended responses. The findings reveal significant difficulties with abstract concepts such as electron flow and reaction intermediates, compounded by insufficient prerequisite knowledge. Participants also reported generally negative attitudes towards online learning, citing issues with the abstract nature of the material. The study underscores the need for enhanced foundational instruction and the incorporation of interactive tools to better support online learning in Organic Chemistry. Recommendations include improving pre-requisite knowledge, integrating more interactive and visual aids, and providing robust feedback mechanisms. These insights contribute to the development of more effective online teaching strategies for complex science subjects.

Keywords:

chemistry, reactions, mechanisms, online, learning.