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DEVELOPING TEACHERS' KNOWLEDGE FOR CONSTRUCTING MULTIPLE REPRESENTATION OF CONCEPTS IN CHEMISTRY

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Abstract

The current situation of teaching and learning chemistry concepts generally in most secondary schools and especially in Nigeria is a great concern to all as a result of poor students' performance and lack of interest in the subject. Regrettably, learning chemistry concepts tends to be by rote and memorizing of content as students find the subject difficult, and as such, do not perceive learning chemistry as relevant to their daily lives. To erase the notion that chemistry is an abstract and difficult subject, this motivated the researcher to explore how teaching and learning of chemistry concepts could be made real and accessible for students using everyday objects to actively engage students with range of representations during classroom teaching. This study developed teachers' knowledge for using multiple representations to teach rate of reactions and collision theory, water pollution and solubility concepts through a professional learning program. Fifteen teachers participated in the professional learning program focused on how to construct, interpret and use multiple representations to teach chemistry concepts in ways that more actively engage students in learning. The study employed a mixed method approach that included descriptive and interpretive methods. Forty teachers completed questionnaire to gather information on the existing range of representations used by the teachers in the teaching and learning of chemistry. Fifteen of these teachers participated in three days of professional learning workshop. The study enhanced the teaching of the rate of reactions and collision theory, and water pollution and solubility concepts by using various constructed representations such as concept maps, particulate representations, graphs, role-plays, flowcharts, and 3D physical models that engaged the teachers in representational challenge. Moreover, the experience of creating a representation also helped the teachers to be creative, resourceful, engaging students in interacting with the real world examples during classroom teaching and ultimately will simplifies students' learning of abstract chemistry concepts. There is need for chemistry teachers' pedagogical content knowledge to be enhanced to enable them to teach with multiple representation strategies.

***Keywords*:** Chemistry, Professional Learning Program, Nigeria.