

**USE OF PROBLEM-BASED LEARNING TO TEACH PROPERTIES,
APPLICATIONS AND REACTIONS OF SUBSTANCES
IN GRADE NINE**

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Today we are living in an information age. We need people with team work skills, joint problem solving ventures and the ability to work on complex open ended problems. In order to make a change in education to satisfy the need of the society, changes in curriculum and changes in teaching-learning processes are made. Teaching-learning process occurs in classrooms. Developments of these skills do not happen in the classroom and students are unable to connect learning with real life situation. Among many teaching-learning processes problem-based learning (PBL) is a novel instructional strategy which caters the above needs. This research report focuses on finding the effectiveness of PBL on learning properties, applications and reactions of substances at grade nine.

Certain lessons of the grade nine science unit of properties, applications and reactions of substances were selected for this research study. The unit was selected for the research studies as it contains basic chemistry concepts and it was the possible unit that can be investigated during the period of research. Two 1AB type schools were selected to conduct research studies considering accessibility, availability and acceptability. Among these schools one was boys' school and the other one was girls' school. In both schools' one class was taught using PBL and another class was taught using non PBL approach. In each school, both the classes were conducted by same teacher. Data were collected through participant observations, diagnostic test, interviews, discussions, photographs, PBL embedded assessment and achievement test. Data collected from multiple sources were analysed by grounded theory and triangulation method. Two sample t-tests were used in quantitative analysis of the studies.

Research studies revealed that through PBL approach students actively involved in the learning process and develop communication and team-work skills. Whereas in non PBL approach students are involved in the process of listening, writing and giving direct single answers. Furthermore study showed that through PBL approach students develop the ability of solving real life problems and gain the better understanding of the concept. Also students move towards deep learning through doing science in the classroom. Thus, PBL is an effective teaching approach which develops the skills that required for society today.

Key words: Problem-based learning (PBL), basic chemistry concepts, learning, skills