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Authentication of chemistry- based concepts in primary grade syllabi (3-5) through environmental- based activities

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Authentic learning can be defined as the learning which happens by actually participating and working on real-world problems. Such approaches based on environmental related activities can be used to inculcate a scientific outlook among students with opportunities for learning in real situations. The objective of this research was to identify the chemistry related environmental topics in the Primary Syllabus and to introduce teaching learning methods authenticated with environmental based activities, which can be applied to teach selected chemistry related topics.

Six topics, (i) water, (ii) food preservation, (iii) solid waste management,(iv) air,(v) soil, (vi) insecticides,in which are discussed basic concepts of chemistry, were selected from environmental-related activity units of grade 3, 4, and 5 of the Primary Syllabus for the study. The Chemistry components of each topic were taught applying environmental based activities and classroom based activities. Environmental based activities were authenticated with a variety of instructional approaches including field trips, mini projects and experiments. Classroom based activities were included classroom discussions, video presentations and role playing. The research sample consisted of 360 students, who were selected from the Western Province on a random basis. A group of 30 students were guided to learn each topic applying environmental-based activities as the experimental group, while an equal number of students were guided to learn the same topic applying classroom-based activities as the control group. As this is a mix method study, quantitative and qualitative data were collected to compare the achievements of students. Simple assessment rubrics were used to collect quantitative data, while the observations, artifacts and focus group discussions were used to collect the qualitative data. Quantitative data were analyzed using MINITAB 14 technical software. Qualitative data were analyzed using thematic analysis technique. Mean marks of the experimental groups for six assessments were 84.00, 88.00, 76.00, 84.00 88.00, 80.00, and mean marks of the control groups were 76.00, 64.00, 64.00, 72.00, 76.00, 68.00 respectively. Results of analyzed data emphasize that the students following the environmental based activities scored significantly higher in knowledge, attitudes, skills and behaviour on chemistry related environmental topics than the students who were exposed to the classroom based activities.

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