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T O X I C O L O G Y I N T H E C L A S S R O O M - UNDERSTANDING CHEMICALS RISKS TO HUMAN HEALTH AND THE ENVIRONMENT-JUSTIFICATION

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Introduction: Pesticides are widely used in farming economies, especially in developing countries and countries with economies in transition, where destruction caused by weeds, diseases and pests are of greater concern. Exposure to pesticides poses health risks for human, nature and the environment, this occurring largely due to careless use and improper disposal of the chemicals. Infants and children are particularly vulnerable to pesticides and other toxic chemicals because of their hand-to-mouth behaviour and general ignorance about chemicals and their potential dangers. Children living in farming areas or whose parents work in agriculture suffer greater pesticide exposure than other children not in such an environment. Chemical-free methods for prevention and management of pests exist. Integrated Pest Management (IPM) and Integrated Vector Management (IVM) methods reduce the use of chemicals to a minimum. Despite this, pesticides are much used in farming economies of today. Use of pesticides to destroy pests can adversely affect non-targeted organisms, including humans. Hence, education is essential to promote safe handling, storage, and disposal of toxic chemicals. In 2005, a group of individuals from the United Nations Environment Programme (UNEP), the World Health Organization (WHO), International Union for Pure and Applied Chemistry (IUPAC) and Universiti Sains Malaysia (USM) developed an interactive multimedia courseware called 'Toxicology in the Classroom' as an initiative to address chemical literacy for the public. The courseware, intended for children ages 9- 13 years, contains general facts on chemistry, risk assessment, pesticides and its safe handling, prevention and protection from contamination, and illustrations on how pesticides can affect human health and the environment. Over the past years, Toxicology in the Classroom has undergone rigorous evaluation and enhancement on its content and method of delivery.

Objectives: The Toxicology in the Classroom Educational Packages are designed with the aim to heighten awareness among young students on the potential side effects of chemicals and to help reduce its careless use and handling . The packages provide teachers and students with basic understanding of toxicology and awareness on the need for precautionary measures and protection to minimise adverse effects on human health and the environment.

Methodology: The Toxicology in the Classroom Educational Packages are made up of materials in several format: CD-Rom, Manual for Teachers and Children Self-Learning, Guide on Teaching Activities for Teachers, Children's Workbook, Story Telling animated video and Flip Charts. The CD-Rom courseware and materials have been rigorously evaluated by content experts and undergone test-runs in schools in Malaysia, Argentina and Ghana. The results have been used to enhance the existing courseware and for the creation of new educational materials for teaching and learning.

Conclusion: The development of the Toxicology in the Classroom New Media Educational Packages for teachers and children has been successfully accomplished and are available for dissemination.