

Innovations in Science Education in Bhutan in context to curriculum change

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The science curricula in Bhutan were either adopted or adapted from neighbouring countries. The recent 'Needs Assessment of Science Education in Bhutan' revealed that the curriculum is fragmented, lacked progression, learning is not standard based, and of the general public perception that it does not prepare learners with life skills.

The curriculum framework and textbooks were developed, and teachers were inducted for the change. The framework encapsulates broad goals of science education and unifying themes or strands. The content strands are life processes, materials and their properties, and physical processes; while working scientifically, focuses on the 21st Century Education Skills of critical thinking, creativity, problem solving, investigation, self-management, and ICT use, with Gross National Happiness as the ubiquitous philosophy of education.

Since Bhutan is severely handicapped with expertise, science educationists from both governmental and non-governmental agencies were engaged in the textbook development, rather than procuring them from other countries. Such books are alienating for learners in many ways. Framework ensures that the content of

textbook is developmentally appropriate; learning is for conceptual construction as opposed to learning by memorization; underpins effective pedagogy; facilitates conducive ambience; facilitates systematic scientific language developments; inquiry-based learning; and that ICT is integrated as the tool of learning.

The development of textbook is based on the Directed to Activity Related Texts strategies that engage learners in activities such as field trips, library research, cartoon concepts, research based project work, maintain scrapbook and do science journaling, inquiry based learning, experimentation, group work, and community engagement.

Assessment underpins the ideal that learners learn better, if varieties of stimuli, in terms of tasks and contexts challenge learners cognitively. As such, the emphasis is assessment 'for' learning as opposed to assessment 'of' the learning, and objectivity of measurement of competencies with clearly defined tools. The innovation of scrapbook and journaling in science are means to move away from the vicious cycle of listening and copying notes as the sole writing exercises. It is a source of entertainment and learning for learners of all abilities.