Chapter 14
Comprehension of Technology in Parent–Child Activities Using Bloom's Taxonomy of the Cognitive Domain

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ABSTRACT

The objective of this study is to investigate the influence of life creativity contests held by museums for elementary school children and their parents on the participants' conceptual cognition of water conservation technologies. A survey is designed to evaluate the change in the participants' conceptual cognition of the technologies, and includes questionnaires on water consumption habits in daily lives, understanding of the water resources in the Taiwan region, and uses of and opinions on water-saving devices. A method on which the assessment of the conceptual knowledge of the participants was based was a content analysis of the interviews. The findings of this study suggested: (a) the creativity contest provided diverse opportunities to improve the participants' cognitive concepts of water conservation; (b) this activity also has positively influenced the learning of knowledge, attitudes, and behaviors of water conservation technologies.

INTRODUCTION

Learning from "extracurricular activities" is an important channel for learning. For example, the real items and exhibitions offered by museums provide a learning environment for students to learn by themselves, which is significantly different from the lecture-based school education. *Life Creativity Contest on Water Conservation* was one of the *Energy Saving Creativity Contests* held by the National Science and Technology Museum in Kaohsiung in 2009. The contest invited elementary school children, together with their family members, to participate and involved them in data collection, current situation analysis, meeting discussion, creativity strategic analysis, model creation, and final presentation during their participation in a series of activities. By conducting surveys on the activities of the *Life Creativity Contest on Water Conservation*, uses Bloom's taxonomy theory to conduct quantitative and qualitative data analyses. This study investigates the influence of the contest on the cognition of school children and their family members on water conservation technologies.

LITERATURE REVIEW

Creativity Contests Improve Learning Motivation

Focus concept-based exploration can prompt learners to think and integrate information (Erickson, 2002).Creativity contests provide a "do-it-yourself" learning opportunity and have become an effective way of learning, in which the participants could apply what they have memorized from the past to the contests, or even amend it to establish correct new knowledge. Hong suggested that the purpose of creativity contests is to promote innovation (Hong, 2003); and creativity design-themed activities could strengthen the creativity designs of life technologies and the core abilities of creation (Hou, 2005). It is hoped that the participants' capabilities of creativity thinking and creation can be stimulated through their participation in the contests, and that they will have memorable experiences and develop deep understanding of the basic principles of science and technology (Chou, 2005).

These types of activities can allow students to link their life experiences and technology. Through practical design activities, discussions, thinking, and the exercise of judgment, the students' higher-order thinking ability is cultivated and their values are established (Lin and Yu, 2004).

Creativity contests emphasize being ready to respond, unconfined by predetermined mindset; not only having to effectively apply past experiences to new challenges, but also needing to think and try more. In addition to knowing how to do it, one needs to learn how to think so as to develop their ability in critical thinking and creativity (Lumsdaine, 1995). Lin (2002) indicated that parents' creativity approach toward upbringing is highly correlated with the life experiences of senior elementary school children about creativity. Creativity is also one of the key ingredients of playfulness (Staempfli, 2005 & Huang, 2006).

Concept of Water Conservation Technologies

Technology has a diverse and extensive influence on human's daily lives. Williams (1985) described technology as purposefully utilizing knowledge and material resources to satisfy human's needs. Wright and Lauda (1993) suggested that technology is the embodiment of knowledge and action produced through

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