Satisfaction Analysis of Experiential Learning-Based Popular Science Education

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ABSTRACT

This study employed Kolb’s experiential learning model-specific experiences, observations of reflections, abstract conceptualization, and experiment-action in activities to serve as the theoretical basis for popular science education planning. It designed the six activity themes of “Knowledge of the Ocean, Easy to Know, See the Large from the Small, Challenge of Vessel Knowledge, Do It Yourself, and Small Book”, with the National Science and Technology Museum (NSTM) as the research site. A questionnaire survey was distributed to 660 visitors who participated in “Large Ship! Formosa! Popular Science Education” to understand their satisfaction and preferences of the activities. The findings of the study suggest that participants were highly satisfied with the activity theme content, learning effects, and the environment and equipment. They also preferred hands-on types of activities. Particularly, “fun and interesting” and “broadening knowledge” are important factors influencing participants’ willingness of participation. Finally, the results can be provided to educators, practitioners, and administrators for future promotion of popular science education.

Keywords: Experiential Learning, Kolb’s Experimental Learning Model, Popular Science Education, Satisfaction Analysis

1. INTRODUCTION

As an island nation, international trade is the main economic feature of Taiwan. Other than shipping, ocean shipping is an important channel for import and export. Growing up in such an environment means that Taiwanese people are familiar with the ocean and vessels, which are the collective memory of the Taiwanese. However, life technology education courses in school education rarely connect them to scientific and technological knowledge, so that students do not have much understand the history, structures, and principles of vessels.

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In terms of supplementing school educational functions, National Science and Technology Museum (NSTM) in Taiwan held the popular science education activities, which can use the educational and entertainment advantage to make people actively participate in and personally experience a complete and systematic theme, to cultivate interest, and further integrate and connect their theoretical knowledge in school and life applications. Furthermore, popular science education activities can be smoothly promoted, with the audience at the center, with the audience evaluation and feedback as the basis for activity planning. Chiu (2010) explored the effects of implementing museum educational activities, and satisfaction with the content, behaviors. The results indicated that the equipment of instructional activities would influence participation intentions of the audience. In view of this, satisfaction surveys can help the design of the activity to be more close to the needs of the audience, and elevate their participation motivation. Meanwhile, analysis of the feedback results also helps the popular science education activities of museums to become more professional, and achieve the ultimate result of popular science for everyone.

Based on above-mentioned research interests, this study aimed to develop a popular science education activity with “Large Ship! Formosa!” as the topic, through experiential satisfaction survey of NSTM visitors to understand their preferences and satisfaction of the activities. The analytical results can be used as the referential basis of promotions and planning of popular science education activity in the future. The research purposes are as follows:

1. To understand the back ground of museum visitors to “Large Ship! Formosa! Popular Science Education”;
2. To analyze museum visitor preferences of the forms of “Large Ship! Formosa! Popular Science Education” activities;
3. To explore museum visitor satisfaction with “Large Ship! Formosa! Popular Science Education”;
4. To analyze the museum visitors’ satisfaction toward “Large Ship! Formosa! Popular Science Education”.

2. EXPERIENCE-BASED POPULAR SCIENCE EDUCATION

Popular science education uses education as the vehicle to broadly promote difficult and abstract scientific and technological knowledge in a people-friendly manner, to elevate the basic scientific and technical literacy of the people (Yuen, 2004; Hsu & Wu, 2007). In order to satisfy people of diverse ages and educational backgrounds, providing actual work involving sensory experiences is an effective learning method (Tseng, 2012). Dewey’s experiential learning believes that learning should begin with the learners’ interests, choose instructional materials that are close to life experiences, and engage in dynamic instruction so that participants can participate and learn by doing (Wu, 2009). Kolb continued Dewey’s perspective in proposing the experiential learning theory (ELT) advocated that learning is the rational reflection of individual experience, in which participants use the cognitive process of sensory perception, through procedural reflection and argumentation, to convert experiences into deeper reflective experiences, to internalize them into meaningful learning results (Chao & Chang, 2011).

Kolb’s experiential learning model consists of the four stage cycle, including concrete experience, reflective observation, abstract conceptualization, and active experimentation. In addition to follow the above four stages, Kolb also suggested that learners can extensively study a topic from various activities or viewpoints to allow them to adapt with different learning styles (Konak, Clark, & Nasereddin, 2014). The four steps of Kolbs’ experiential learning theory are illustrated as follows (Chang & Chuang, 2009; Konak, Clark & Nasereddin, 2014).

Concrete experience: refers to being involved with a new experience; an individual’s
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