Chapter 13
Museum without Walls: Digital Technology and Contextual Learning in the Museum Environment

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EXECUTIVE SUMMARY

How people learn informally and contextually within cultural institutions has been researched considerably. Various learning theories that are appropriate for museum visitors have been thoroughly discussed and broadly published. Falk and Dierking's Contextual Model of Learning (CML) introduced in the 1990s has had a tremendous influence on the theory of museum education. The focus on object-centered learning has been shifted to visitor-centered learning in the field of museum education. Museum educational professionals and researchers believe that this shift empowers museum visitors to construct and customize their museum learning experiences at their own pace and style. Moreover, utilizing technology to promote exhibitions and to deliver information about museum collections has become a common strategy for museums. In 2008, Falk and Dierking further explained the relationship between their CML and technology currently being adapted by the museum to enhance visitors' informal learning experiences. However, there is a need to examine how technology can be used to enhance visitors' learning experiences in a museum. Hence, this chapter poses the following questions: 1) How has technology been

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incorporated into museum galleries to enhance visitors' understanding of exhibitions since 50s? 2) What digital technologies have been adopted by cultural institutions to better serve diverse visitors, and what can this technology offer museum visitors for their informal learning? 3) What are the challenges and concerns for utilizing digital technology?

To answer these questions, this chapter first reviews the development and the historical uses of technology in cultural institutions with sample cases. Secondly, this chapter examines the relationship between technology and Falk and Deirking's CML. In the end, this chapter discusses the benefits, challenges, and concerns that museums might face when using technology in exhibitions. Through the historical review of museums utilizing technology in exhibitions and the museum learning theory of the CML, this chapter provides a few thoughts for museum educators to keep in mind when they are planning to integrate ever-innovative technology into museum education. The use of technology in the museum should be able to enhance and customize visitors' meaningful learning.

Technology was first implemented in exhibition design and gallery interpretations in the 1950s. Since then, the development and instructional use of technology in museums has increased significantly. With the recent trend in visitor-centered initiatives being encouraged by museum professionals, cultural institutions are arranging exhibitions and displays, offering activities and programs, as well as developing materials to better augment visitors' on-site and off-site learning experiences. The most ubiquitous augmentations are the utilization of different digital technology and virtual museum (Mediati, 2011). For instance, Lu (1999) pointed out that museums installed flat-screen televisions for presenting exhibition and art object information while Chao and Lai (2008) found that museums used personal portable electronic devices for interpreting articles and developed interactive computer programs for inviting audiences' active discovery learning. Recently, Buffington (2008) and Lopez, Daneau, Rosoff, and Cogdon (2008) indicated that distance learning and virtual exhibitions through museum websites, podcasts, and electronic networking are becoming more common.

A BRIEF HISTORY OF TECHNOLOGY IN MUSEUM SETTINGS

Technology can be defined as any mechanical device that is manipulated electronically from the aspect of electromagnetic functions. A handheld device, invented in 1952, was the first technology used to give an audio tour of a museum setting (Tallon, 2008). Although there are several debates as to when the first electronic handheld audio device was used in a museum and which museum first used one for