國立臺灣大學文學院圖書資訊學系

碩士論文

Department of Library and Information Science

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Master Thesis

# 應用虛擬實境技術建置生態博物館

## —以國立臺灣大學博物館群為例

# Using Virtual Reality Technology to Construct an Eco-Museum – A Case Study of National Taiwan University Museums

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# 摘要

虛擬實境的技術在過去有不少應用在博物館展示與導覽上，由於技術的特性，可以帶給觀眾更多元的觀展視角以及體驗，讓觀眾不受時間與空間的限制在任何自由的時間遊歷大範圍的地區。除此之外，在生態博物館相關的研究上，鮮少有觀眾經驗之實證研究。因此，本研究以國立臺灣大學臺大博物館群作為主要觀察的場域與研究的核心，採用了虛擬實境的技術，建置出以地區整體作為經營理念的生態博物館。進一步探討在虛擬生態博物館中，觀眾之參觀行為與學習歷程，並設計了不同回饋之導覽設計，以嘗試了解虛擬博物館與生態博物館的參觀經驗，最後，也探討了不同觀眾身分之參觀經驗差異。為了了解觀眾之參觀行為與經驗，本研究共招募了 117 位 14 歲到 39 歲之受試者，實驗主要分為三個階段，第一階段受試者必須完成觀眾背景經驗問卷；而第二階段則是根據第一階段所收回之背景經驗平均分組，分別分到具有回饋導覽設計與不具有回饋導覽設計兩個組別，其中，背景身分則是依據受試者與臺大的關聯程度，分為校內與校外兩個組別，在第二階段受試者須完成虛擬生態博物館的參觀體驗。第三階段則是受試者在進行參觀體驗後，對於虛擬生態博物館進行評估，並完成有關於臺大博物館群相關知識之測驗與生態博物館屬性評估問卷。

研究結果顯示，觀眾之參觀行為與學習歷程會受到先備知識與不同導覽設計所影響。與臺大關聯程度較高者，在博物館學習的效率較高，而對於具有回饋導覽設計之組別則是在參觀時與研究者產生較多互動。在觀眾經驗上，虛擬生態博物館顯著提升了觀眾對生態博物館概念的理解，結果也支持虛擬實境的技術能提供一個高度學習的環境，有助於提升觀眾對於區域文化的認識與感受。且對於與地區不同關聯程度者在學習表現上也有所不同，關聯程度越高者表現越佳。基於結果與發現，本研究對博物館展示與教育提出在互動設計與內容展示之實務建議，並對觀眾研究提出評估方法與工具建議。

關鍵詞：生態博物館 、虛擬實境、博物館經驗、博物館學習



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# Abstract

Virtual reality technologies have been applied to many museums and tours to accommodate and develop visitors' diversified viewing styles and perspectives. With the strengths of VR to simulate and build up a rather immersive and comprehensive world, previous endeavors of museum VR focused on individual exhibits or artifacts, and few attentions were paid to the larger eco system of the museums and the surroundings. Eco-museum studies, on the other hand, were mostly based on higher-level philosophical discussions on the idea or conceptual framework, and more empirical studies would be required to investigate and testify the idea. Therefore, this study intends to use VR technology to build a virtual eco-museum to explore if VR affordance of simulation and immersion facilitate visitors' eco-museum experiences. Based on NTU Museums, this study designed and developed a virtual eco-museum for visitors to access via their mobile devices with their behaviors being recorded. A total of 117 participants, aged from 14 – 39, volunteered to take part in this study with informed consent.

The methodology of user experiment was adopted, and this study designed a three-phases experiment session to examine visitors' behavior and experience under different feedback designs with their personal context of locality being considered. Using the between-group design, participants with different background were assigned to two groups equally to test the two types of feedback design of the virtual museum, and give their evaluation at the end of the visit. The results of the study showed that visitors' visiting behaviors and learning processes were affected by their prior knowledge and different feedback designs of the virtual eco-museum. Local people who had associations with NTU geologically and culturally spent less time visiting the museum yet performed better understanding of NTU museums after visits, which suggested more effective museum learning experiences. Design with feedback triggered more interaction from the participants with the virtual eco-museum, but did not significantly affect their learning performances. Results from both the quantitative and qualitative analysis suggested that visiting the virtual eco-museum not only significantly enhance visitors' understanding of the eco-museum concept, but also improve visitors' recognition of NTU Museums' mission and functions for the regional culture, and increased their visiting willingness.

To conclude, this study provided empirical support for the integration of VR technology in an eco-museum approach to museum practices of curation and education.



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Methodologically, this study developed a systematic measurement of visitors' learning experiences in the virtual eco-museum that could effectively capture and interpret their behaviors and meanings.

Keywords: eco-museum, virtual reality, museum experience, museum learning



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