

# 運用資訊科技促進高中學生地球科學學習之研究

## Using Information Technology to Enhance Students' Earth Science Learning

賴慶三 Ching-San Lai

國立臺北教育大學 自然科學教育學系 National Taipei University of Education

E-mail : [clai@tea.ntue.edu.tw](mailto:clai@tea.ntue.edu.tw)

### 摘要

隨著資訊科技的蓬勃發展，資訊科技對中小學的教學和學習都產生非常重大的影響。本研究之目的，旨在融入資訊科技於學生的科學學習，以探討學生的地球科學學習表現。本研究的研究對象有 31 位高中學生參與。研究教學活動過程中，教師先引導學生對資訊科技議題進行探討，並對地球科學之礦物與岩石進行探究，同時搭配立體影像攝影系統進行操作學習，以強化學生資訊科技的應用，最後學生必須完成一份立體影像的地球科學簡報作品。研究工具依照 Kirkpatrick and Kirkpatrick (2007) 的評鑑模式，使用教學滿意度調查問卷(李克特式 4 點量表，Cronbach's  $\alpha = .83$ )，進行資料搜集，藉以瞭解學生對立體影像科技應用的使用回饋意見，同時也搜集教師的教學回饋意見，作為資料分析的依據。研究結果發現，資訊科技與地球科學的跨界訓練與應用，能促進學生對地球科學的學習興趣，同時增進學生的資訊科技素養。教師對立體影像教學及學生的地球科學學習成效，也表達肯定的意見，這說明教師的回饋意見與學生的回饋意見一致，顯示師生對資訊科技融入學生的地球科學學習表示支持與認同。根據研究結果，本研究認為立體影像資訊科技的教學與應用，確實有助於增進學生的地球科學與科技創新之學習表現。

**關鍵字：**立體影像、地球科學、科學教育、資訊科技

### Abstract

The purpose of this study was to evaluate the learning effectiveness of using information technology into high school students' Earth science learning. There were 31 high school students participated in this study. Students were guided to explore the topics of information technology and Earth science, and given instructions for using a 3D imaging technology system in order to promote their training in and application of both information technology and Earth science. This study searched both quantitative and qualitative data as the sources for the analyses. A Learning Questionnaire (4 point Likert-type scale) was employed to gather students' feedback

on their learning with the 3D imaging technology system. In addition, a rubric was used to evaluate the students' Earth science projects. The results indicated that the integration of information technology into Earth science learning promotes students' learning outcomes. The results also showed that most of the participating students had a clear understanding of the functions of 3D photography, and were satisfied with using 3D photography in their Earth science learning.

**Keywords:** earth science, information technology, science education

