數學教材設計之研究－以視覺設計理論為基礎

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摘要

　　數位化教學媒體的不斷推陳出新，教師得以運用不同的方式呈現教學內容。然而，不當的設計不僅對學習無助益，往往干擾學習。如何正確利用視覺元素作視覺引導，將訊息正確地傳達，是推動資訊科技融入教學的一個非常重要的課題。邱建偉（2005）在他的碩士論文中以數學簡報系統為平台，作了初步的研究與探討，並對於數學教材的呈現方式，提出了一些原則。本文便是接續了上述的研究，作更深一步的探討。

　　本研究從心理學出發，探討知覺及認知科學在教學媒體上的應用；再由視覺設計領域切入，尋求數學教材畫面呈現的相關啟示；最後在教學媒體的理論中了解數學放映性視覺媒體的功能與特性。在探討了相關的基礎理論之後，將這些理論應用到教師導向教學媒體上，針對媒體呈現時畫面的構圖、色彩、造形元素、文字、視覺引導策略、動態呈現、錯視現象的修正，提出了可遵循的原理原則。並發展了在 MathPS 平台之下設計視覺化教材的方法，希望作為日後教師製作 PowerPoint 教材時的參考。

A Study on Mathematical Teaching Materials Design Based on Visual Design Theories

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Abstract

Digitalized instructional media finds and produces creative motivative idea and thought continuously. Teachers may use different ways to express their materials, though unproper design is both uselss and helpless for learning, and disturbing learning process.It is an essence that improving information technology integrated instruction that adopting visual element referring visual guidance and delivering information properly. Chien-Wei Chiu（2005）has summaries some principles of demonstrating teaching materials. This thesis continued above study and makes a further reserch.

This research started on the psychologicals viewpoint, explored perception and cognitive science applied for instructional media ; moreover entered into visual design field, searching realated inspiration about mathematical material presentation, finally to realize the functions and characteristics of mathematical projected visuals. After understanding these related theories, appling these to teaching oriented instructional media. Finally, I made some principles, rules and methods which focus on the composition, color, construction elements, text, visual guding device, dynamic presentation, and correction of illusions, and developed the methods of material visualize design of MathPS to benefit production of mathematical materials in PowerPoint for teachers.