

On School-sites virtual Reality-based Training Program for social adaptive and emotional training on children with Autism Spectrum Disorder (vPAD-II)

在校虛擬現實環境學習計劃對自閉症兒童的社會適應性和情感表達訓練

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項目團隊

vPAD-II Project Team

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計劃內容簡介

*What is Immersive (Virtual Reality) Environment?
Why it can be used as an effective learning environment?
How does it promote learning?*

何為虛擬現實環境？
它為什麼是一個有效的學習環境？
它如何幫助學生學習？

虛擬實景 - 技術主導

Immersive environment - Technology-driven Definition



虛擬實境技術能夠給予使用者多感官刺激，為使用者模擬接近真實世界的情景

Technologies that deliver high fidelity output which stimulate multi-modal sensory perceptions equivalent to what we experience in a given real world or imaginary situation.

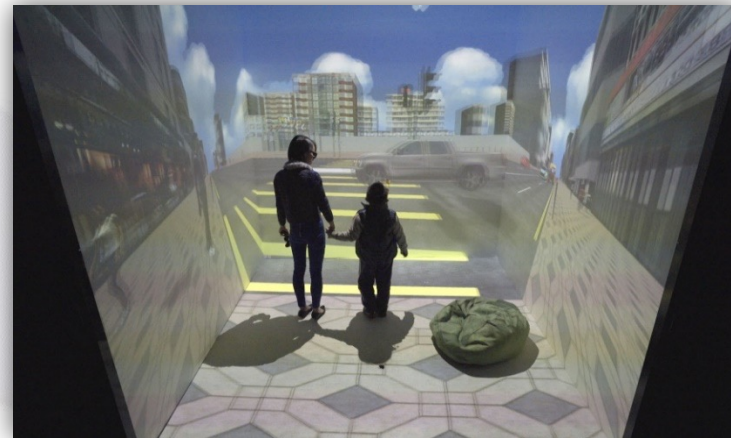
- 真實感 – 圖形建模，圖形渲染，3D 顯示
Realistic – graphical modeling, rendering, 3D display
- 可互動性 – 動作 / 位置偵測器，電腦視覺
Interactive – motion/position sensors, computer vision
- 實時 -> 並行運算處理，圖像處理器
Real-time -> parallel computing, GPU
- 多感官 -> 4D, 觸感回饋
Multisensory -> 4D, haptic (force) feedback



Immersion 沉浸 →
Sensory 感官

Presence 臨場感
Being there 親歷其景

→ *Affects 情感*
Behavioral Adjustment 行為改變



虛擬實景的應用

Immersive VR Applications



- 娛樂
Entertainment (interactive games, 3D movie)
- 教育
Education
- 職業訓練
Skill-based Training (surgery, sports, pilot, rehab)
- 心理治療
Psychotherapy (smart ambience therapy, phobia)

虛擬實景學習環境 *Immersive learning environments*

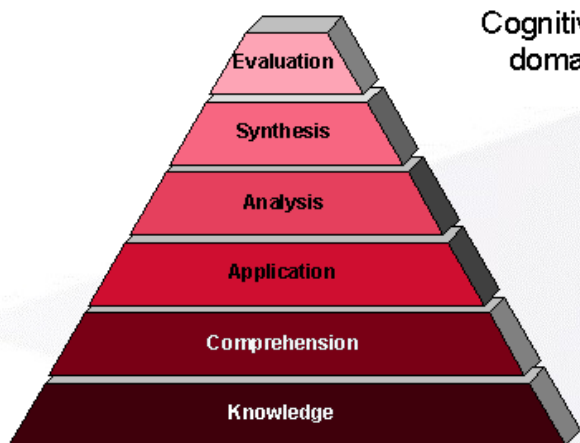
An immersive environment that provides authentic or imaginary *virtual scenarios* that stimulate *novel (affective) learning experience* (interest, excite, curious, fear, motivate, serene, etc.) based on one or more *pedagogical models* (authentic, experiential, problem-based, game-based, etc) to achieve defined *learning outcomes*

虛擬實境學習環境是一個透過虛擬空間構建的新穎學習環境，以多方面刺激感官（興趣、興奮、好奇、恐懼、激勵、平靜等），並基於一種或多種教學模式（真實的、體驗式的、基於問題的、基於遊戲的等），用像真或虛擬的情境來達致預定的學習效果。



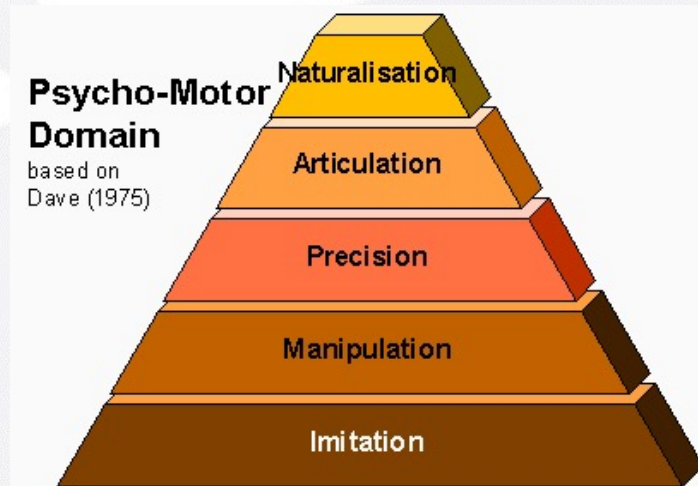
虛擬現實學習環境 – 整合三大學習領域

Immersive Learning – integration of 3 Domains of Learning

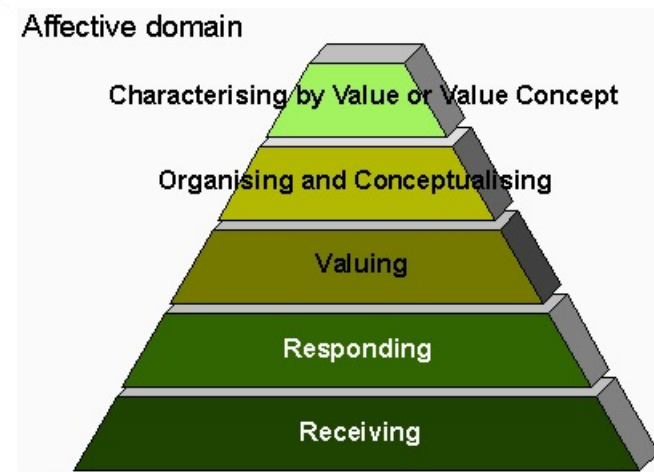


Cognitive domain

(Bloom 1956)
認知領域



技能領域



情感領域
(Krathwohl, Bloom & Masla 1965)

設計虛擬現實學習情境要做到 Immersive Learning Scenarios should be

認知層面具備挑戰性
情感層面具備刺激性
技能層面具備支援性

Cognitively challenging
Kinesthetically enabling
Affectively stimulating

虛擬現實學習環境 – 臨場感對影響學習遷移的心理機制

Immersive Learning – Psychological mechanism of Presence on learning transfer

結構方程建模

Structural Equation Modelling

- 臨場感與興奮感和充實感有著直接而顯著的正面影響
Presence was significantly & positively associated with arousal & flow
- 興奮感和充實感與享受感有正面而強烈的直接影響
Arousal & flow were significantly & positively related to enjoyment
- 知識轉移的意欲直接且正面受享受感影響
Enjoyment was significantly & positively related to learning transfer intention

虛擬現實學習環境 – 行為改變的神經原理

Immersive Learning – neural mechanism of behavioral change

透過磁力共振掃描觀察的研究顯示

Studies using Functional MRI

- 腦內掌管視覺的區域的活躍度在對比訓練前後出現轉變
Changes in brain activation in region (visual attention) before and after training
- 腦內掌管解難和語言分析的轉變和心智理論與情感識別能力的提升有關
Improvements in theory of mind & emotion recognition were associated with changes in brain activation in regions (conflict resolution and language processing)

vPAD-II 團隊 - 成功經驗

虛擬情境藝術治療系統 – 幫助受虐兒童

Smart Ambience Therapy (SAT) – to help abused children



虛擬情境
Smart Ambience Therapy
藝術治療

Science Museum Home

中文

A new exhibit, "Smart Ambience Therapy" or "SAT" was launched in Life Sciences Hall on the ground floor of the Science Museum. The SAT, developed by a team of researchers at the AIMtech Centre of City University of Hong Kong and their collaborating partners from the Hong Kong Association of Art Therapists, is a pioneering application of interactive media and virtual reality technology in art therapy, particularly for psychotherapy of children who have been physically or emotionally abused.

The SAT system interacts with children by responding to their motions without requiring them to wear any sensor or special clothes. It captures and translates children's body motions and gestures into visual forms and movements. By wearing a pair of stereoscopic glasses, children can see 3-dimensional virtual objects and feel immersed in the environment. Children can also manipulate and interact with the virtual objects therein.

Based upon traditional art therapy, the treatment protocol developed for SAT consists of four phases in which children would participate in a number of interactive games in each phase. The treatment starts with some warm-up games which help build rapport with the children. Through some other games, the therapists would encourage the children to overcome their fear, anger and anxiety, and subsequently to build self-confidence. In the final consolidating games, children would be reassured of their positive feelings about themselves and their future.

If you would like to gain a personal experience of the Smart Ambience Therapy, come and try out some of the interactive games in the Science Museum.

The SAT exhibit is sponsored by the City University of Hong Kong.



DIPLÔME

SALON INTERNATIONAL DES INVENTIONS GENÈVE

Après examen, le Jury International a décidé de remettre à: HORACE IP

pour l'invention: Thérapie d'ambiance intelligente

MÉDAILLE D'OR
GOLD MEDAL
GOLD MEDAILLE

Genève, le 20 avril 2007

Le Président du Jury

Le Président du Salon

虛擬情境情意學習系統

Smart Ambience for Affective Learning (SAMAL)

香港城市大學AIMtech中心設計和建造虛擬情境情意學習
(SAMAL)用於信息管理課的通識教育課程與生命科學

SAMAL was designed and developed by AIMtech Centre, CityU. It aimed to assist teaching **General Education** in **Biological Science** classes in secondary schools.



InSPAL - 為嚴重智障學童互動「智境」學習計劃

Tailored to children with Severe Intellectual Disability (SID)



(Supported by QEF)

- **目標:** 提升嚴重智障(SID)學生的注意力，協助學生探索環境，誘發學生的**情感表達能力**及發展學生的**溝通能力**
Aim : To enhance SID childrens' attention span, **emotional skills** and **verbal skills** as well as helping them to explore the environment
- **成效: Effects:**
 - 提升了學生的學習參與性
Enhancement in class engagement for SID children
 - 減低了受他人協助的需要
Reduced the need from the caregiver
 - 加強了教師對學生周邊環境調整的注意及了解
Enhanced teachers' awareness regarding safety and environment while tailoring spaces for SID children

