資訊科技教育教學法系列：
在小學有策略地運用移動學習設計教學活動以提升學生的參與及學習效能

第二節

Version4

香港中文大學
學習科學與科技中心 (CLST)

Centre for Learning Sciences and Technologies (CLST)
The Chinese University of Hong Kong

課程大綱

- 第一節：
  - 1.1 移動學習在課程中的作用和重要性
  - 1.2 全方位學習（LWL）和移動學習概述
  - 1.3 配合EduVenture和其他移動學習系統的探究式學習（IBL）
  - 1.4 香港中文大學戶外考察
  - 1.5 課業簡介

課程大綱

- 第二節：
  - 2.1 課業討論及回饋；
  - 2.2 運用EduVenture Composer創建地圖數據/熱點和多媒體內容；
  - 2.3 介紹用於環境調查的電子傳感器；
  - 2.4 不同科目運用移動學習的教學案例之討論；
  - 2.5 賬戶管理和設備的安排；
  - 2.6 介紹移動學習活動的替代方案；
  - 2.7 課程總結

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  - 2.6 介紹移動學習活動的替代方案；
  - 2.7 課程總結

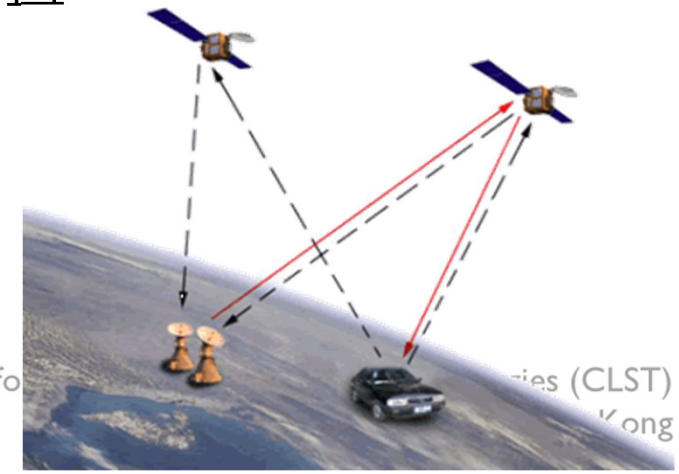
全球定位系統
(GPS-based technology)

- 又稱全球衛星定位系統（Global Positioning System簡稱GPS）
- 由美國國防部研製和維護，可以為地球表面絕大部分地區（98%）提供準確的定位、測速和高精度的時間標準。
- 系統包括太空中的24顆GPS衛星；地面上的1個主控站、3個數據注入站和5個監測站及作為用戶端的GPS接收機。
- 最少只需其中3顆衛星，就能迅速確定用戶端在地球上所處的位置及海拔高度；所能收聯接到的衛星數越多，解碼出來的位置就越精確。

全球定位系統
(GPS-based technology)

- 這24個衛星不斷環繞太空，不斷發送其所在位置及時間，提供地面接收機機收訊息與計算位置；

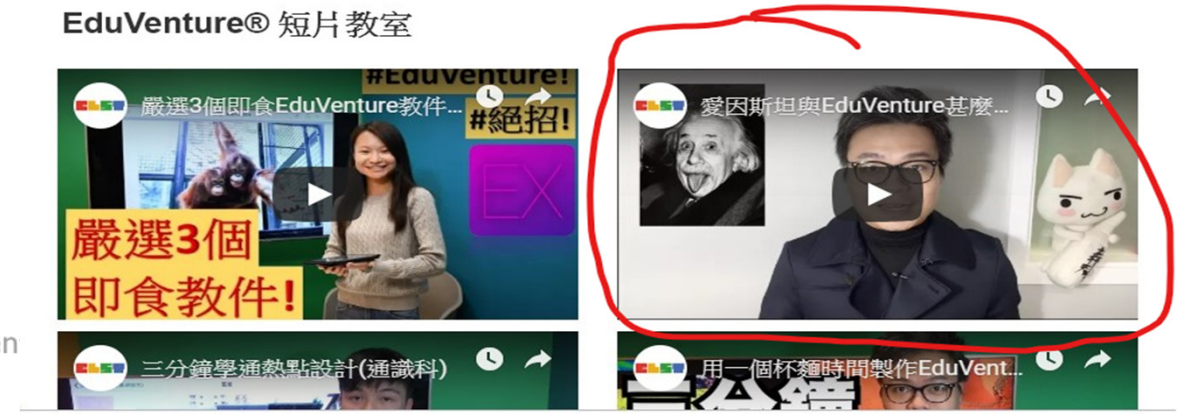
- 地面上主控站、數據注入站及監測站為管理衛星系統使用；而大家所用的就是接收機，接收衛星提供訊息，以計算接收機的位置。



Centre fo ies (CLST)
Kong

全球定位系統
(GPS-based technology)

- 廣泛應用在天文台、通信系統基站
- 工程施工：採用GPS設備進行工程測量
- 勘探測繪：野外勘探及城區規劃中都有用到
- 導航及定位
- 車輛防盜及通信移動設備防盜系統



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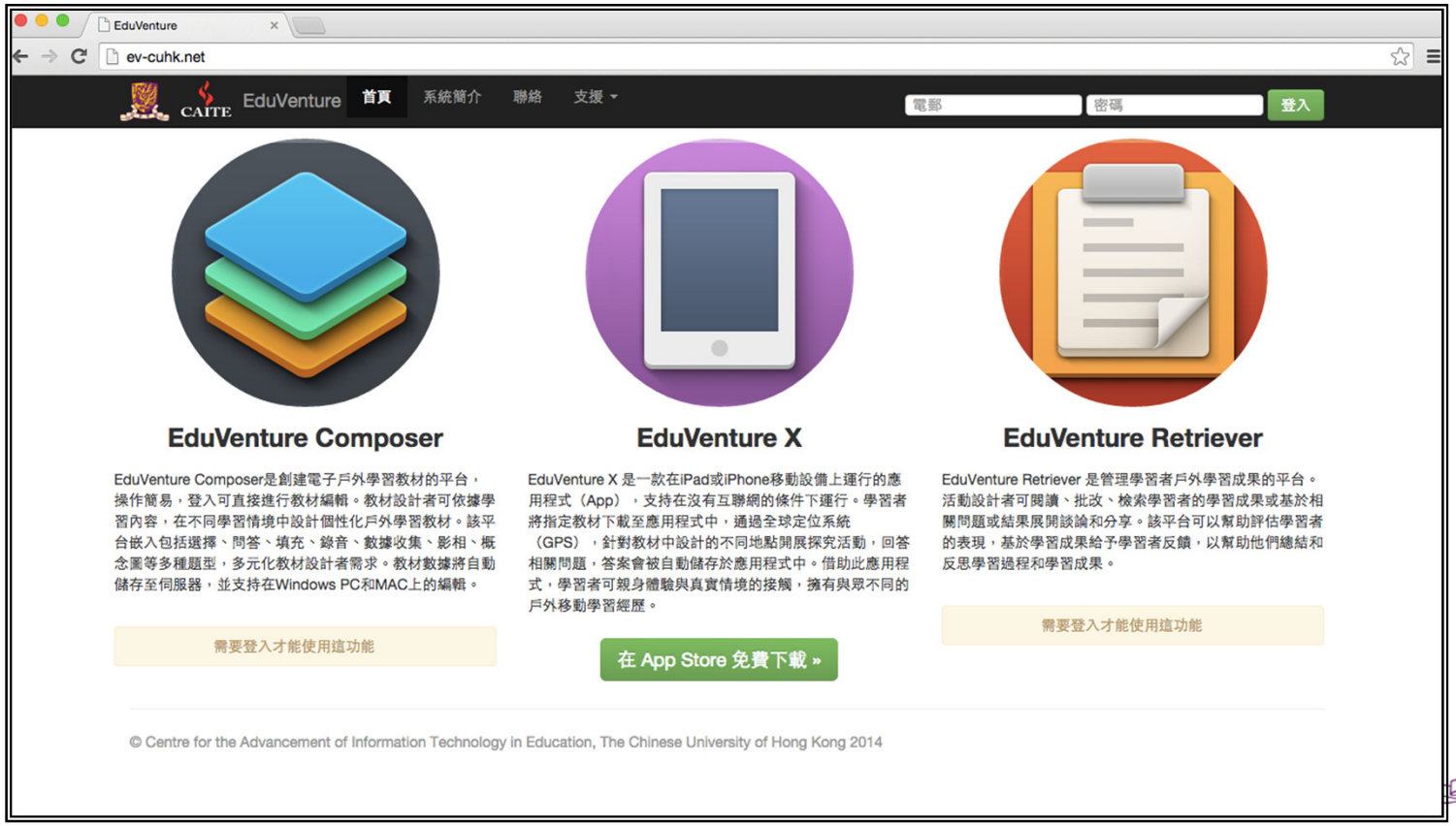
(A) 認識 Eduventure 基本操作介面

步驟一：登入編寫教件系統

http://ev-cuhk.net/

登入身份: Wallace Man (EduVenture 共享社群)
帳號/密碼設定 | 登出



步驟二：登入編寫教件系統

編寫教件 | 進行活動 | 活動檢討

EduVenture Composer

EduVenture Composer是創建電子戶外學習教材的平台，操作簡易，登入可直接進行教材編輯。教材設計者可依據學習內容，在不同學習情境中設計個性化戶外學習教材。該平台嵌入包括選擇、問答、填充、錄音、數據收集、影相、概念圖等多種題型，多元化教材設計者需求。教材數據將自動儲存至伺服器，並支持在Windows PC和MAC上的編輯。

進入 EduVenture Composer »

EduVenture X

duVenture X 是一款在iPad或iPhone移動設備上運行的應用程式（App），支持在沒有互聯網的條件下運行。學習者將指定教材下載至應用程式中，通過全球定位系統（GPS），針對教材中設計的不同地點開展探究活動，回答相關問題，答案會被自動儲存於應用程式中。借助此應用程式，學習者可親身體驗與真實情境的接觸，擁有與眾不同的戶外移動學習經歷。

在 App Store 免費下載 »

EduVenture Retriever

duVenture Retriever 是管理學習者戶外學習成果的平台。動設計者可閱讀、批改、檢索學習者的學習成果或基於相問題或結果展開談論和分享。該平台可以幫助評估學習者表現，基於學習成果給予學習者反饋，以幫助他們總結和思學習過程和學習成果。

進入 EduVenture Retriever »

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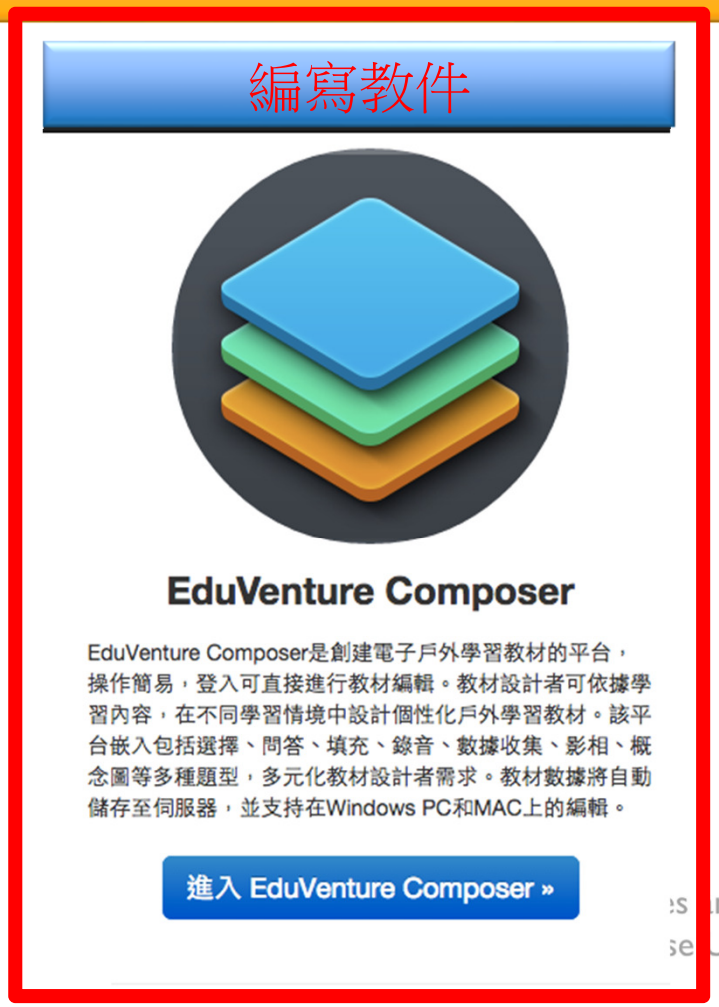
步驟三：登入編寫教件系統



步驟四：認識編寫教件系統工作環境

步驟五：創建新考察教件

1 輸入考察名稱

2 輸入考察描述

3 選擇考察語言/共享/顏色

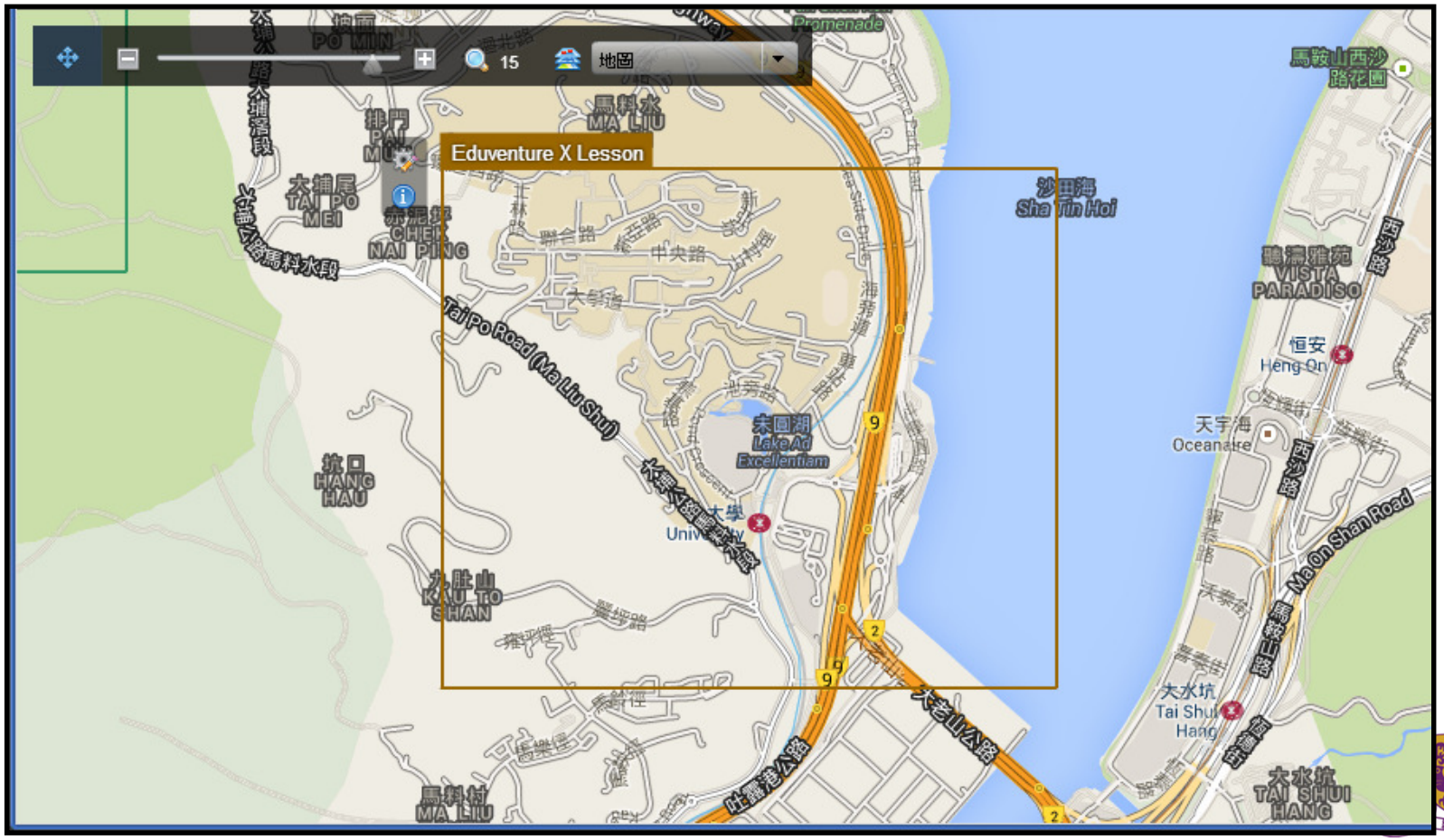
4 選擇考察範圍

5 上載考察封面圖片

6 選擇考察是否發佈

7 選擇考察所屬 KLA/ 學科

步驟六：設定考察範圍


15
地圖
Eduventure X Lesson
Promenade
馬料水
MA LIU
排門
PAI MUN
大埔尾
TAI PO MEI
赤泥坪
CHEK NAI PING
沙田海
Sha Tin Hoi
馬鞍山西沙路花園
聽濤雅苑
VISTA PARADISO
恒安
Heng On
天宇海
Oceanaire
Tai Po Road (Ma Liu Shui)
未圓湖
Lake Ad Excellentiam
大學
University
坑口
HANG HAU
九肚山
KAU TO SHAN
大水坑
Tai Shui Hang
大水坑
TAI SHUI HANG
馬料村
MA LIU
Ma On Shan Road
大老山公路
吐露港公路
西沙路

步驟七：加入熱點 及 編輯熱點 及 加入題目

步驟八：加入熱點

1 加入熱點

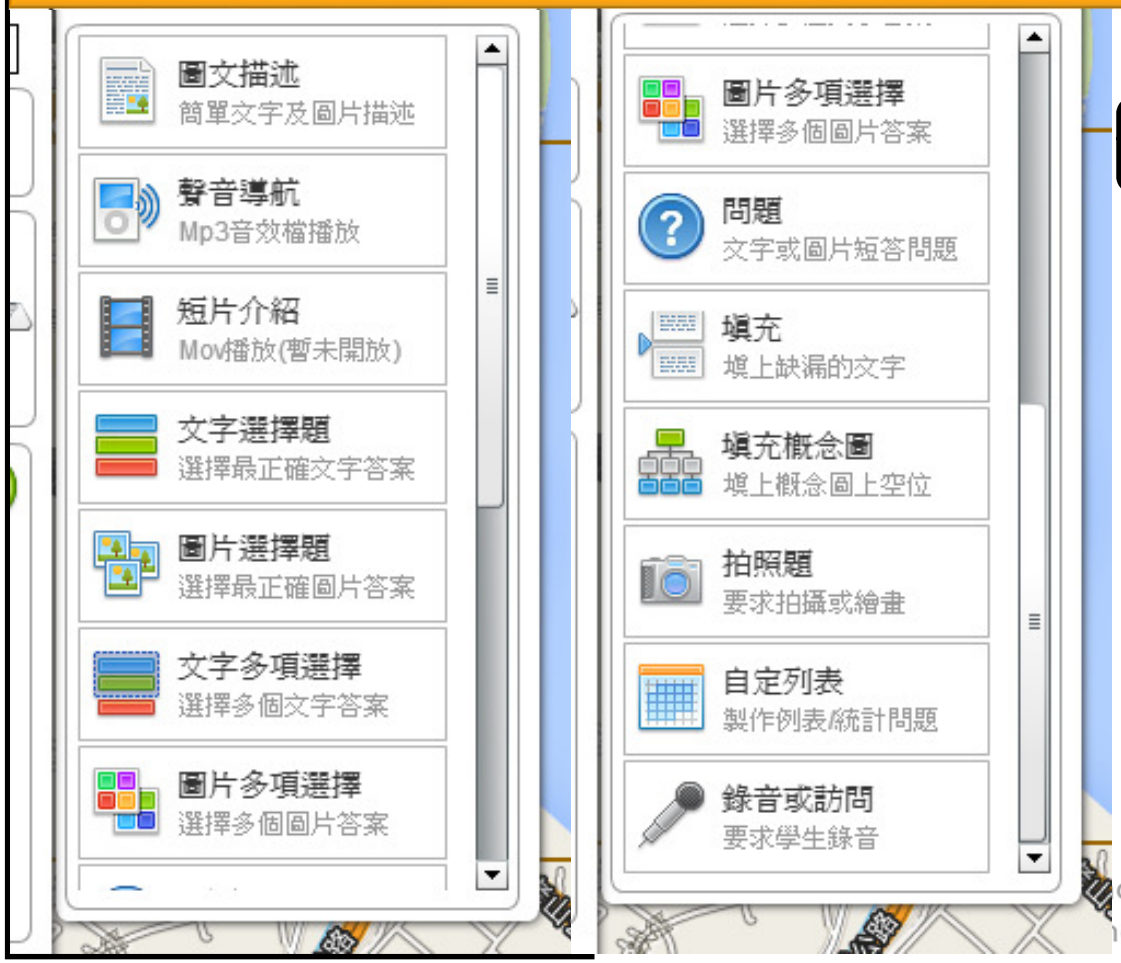
步驟九：編輯熱點

2 輸入熱點位置

3 選手熱點顏色

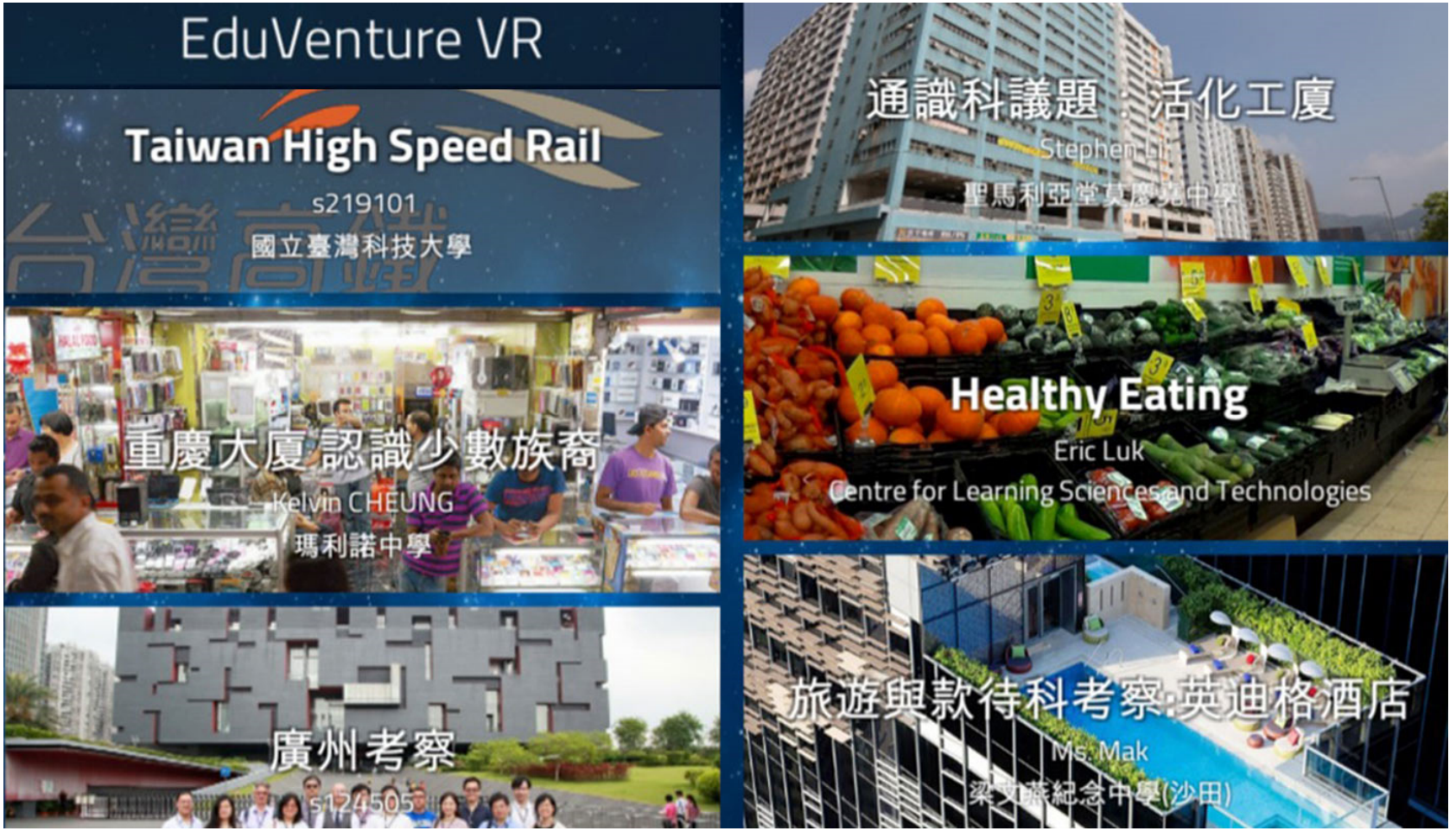
4 輸入熱點問題

步驟十：編輯熱點 題目題型



5 選擇熱點問題題型

EduVenture VR



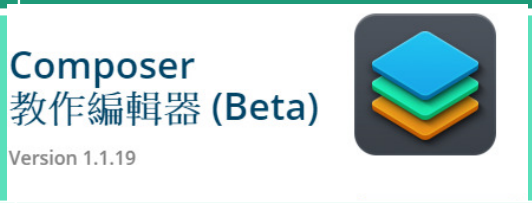
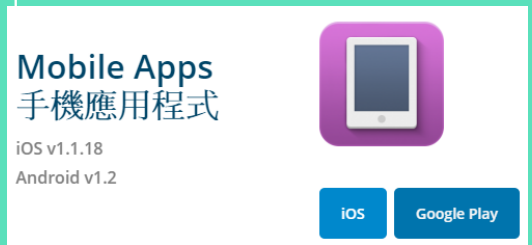
(B) . EduVenture VR

- EduVenture VR (EVVR) is an online platform to carry out Virtual Reality (VR) learning. Using the EVVR composer, teachers can distribute VR content and construct a VR field trip for students.

- They can also add interactive elements inside to enhance students' learning motivation. With mobile devices and tray glasses on hand, students can experience outdoor learning in VR style, which makes teaching and learning more interesting and flexible.

Entering EduVenture VR

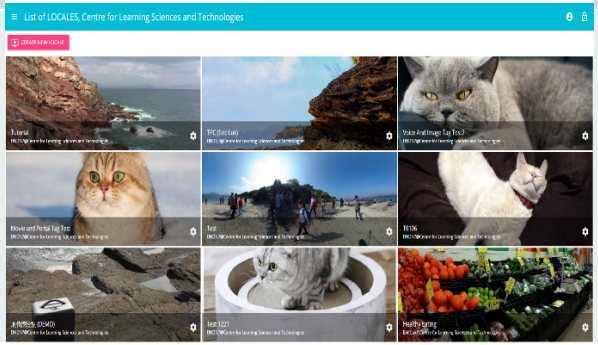
Open the browser and enter the URL: http://vr.ev-cuhk.net

Step	Procedures	User Interface
1	Press the button to enter the EVVR Composer	
2	Go to iTunes (iOS) / Play Store (Android) to download the EVVR App	

EduVenture VR Composer

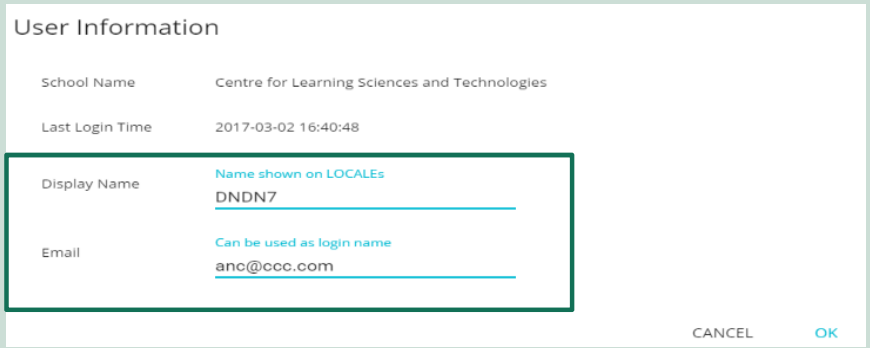
Using the EVVR Composer, teachers can distribute VR content and create their own teaching materials.

In order to identify the owner of the VR content, teachers will be given a username and password to login.

Step	Procedures	User Interface
1	Input username and password, then press "OK" .	
2	Upon successful login, teachers should be able to see a list of VR contents in the main menu.	

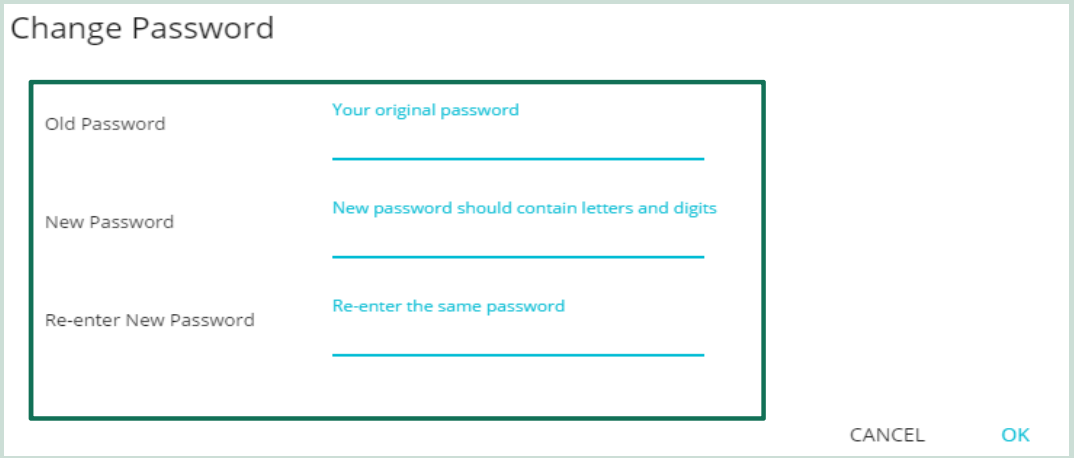
Control Panel

How to Edit User Account Information

Step	Procedures
1	Press at the top, then select "My Info" (name and email).
2	Input the new name, email or password, then press "OK".
3	Press "Cancel" to discard everything and return to main menu.
UI	

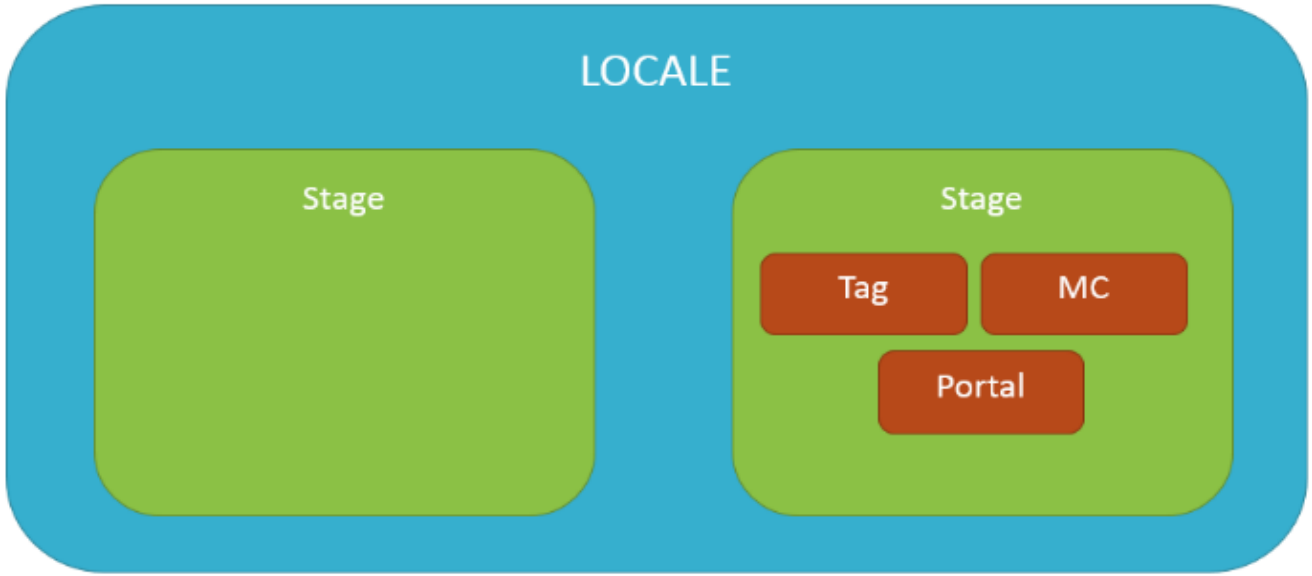
Control Panel

Similarly, teachers can also change their password.

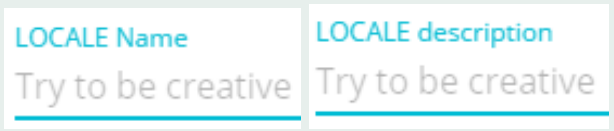
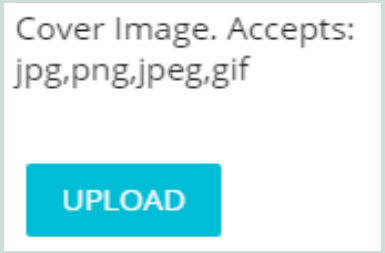
Step	Procedures
1	Press at the top, then select “Change Password”.
2	Input the old password and new password, then press “OK”.
3	Press “Cancel” to discard everything and return to main menu.
UI	

Locales

- "Locale", place or locality, especially with reference to events or circumstances connected with it
- "Locale" is referring to the VR learning materials. Each locale is made up of a series of stages;
- Each stage can either be a 360 movie or a 360 image. These stages can combine together to produce a VR learning experience.



How to Create a Locale

Step	Procedures	User Interface
1	Press “Create New Locale” at the top.	
2	Enter the locale’s name and description. Be creative!	
3	Upload the locale’s cover image (jpg, jpeg, png, gif).	

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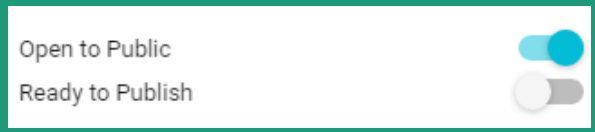
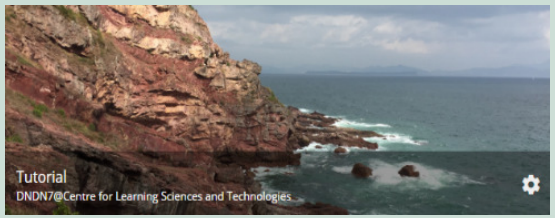
ng

How to Create a Locale

4	Indicate these 2 settings. “Open to Public”: Can all users view the locale? “Ready to Publish”: Is the locale ready to be used by public?	

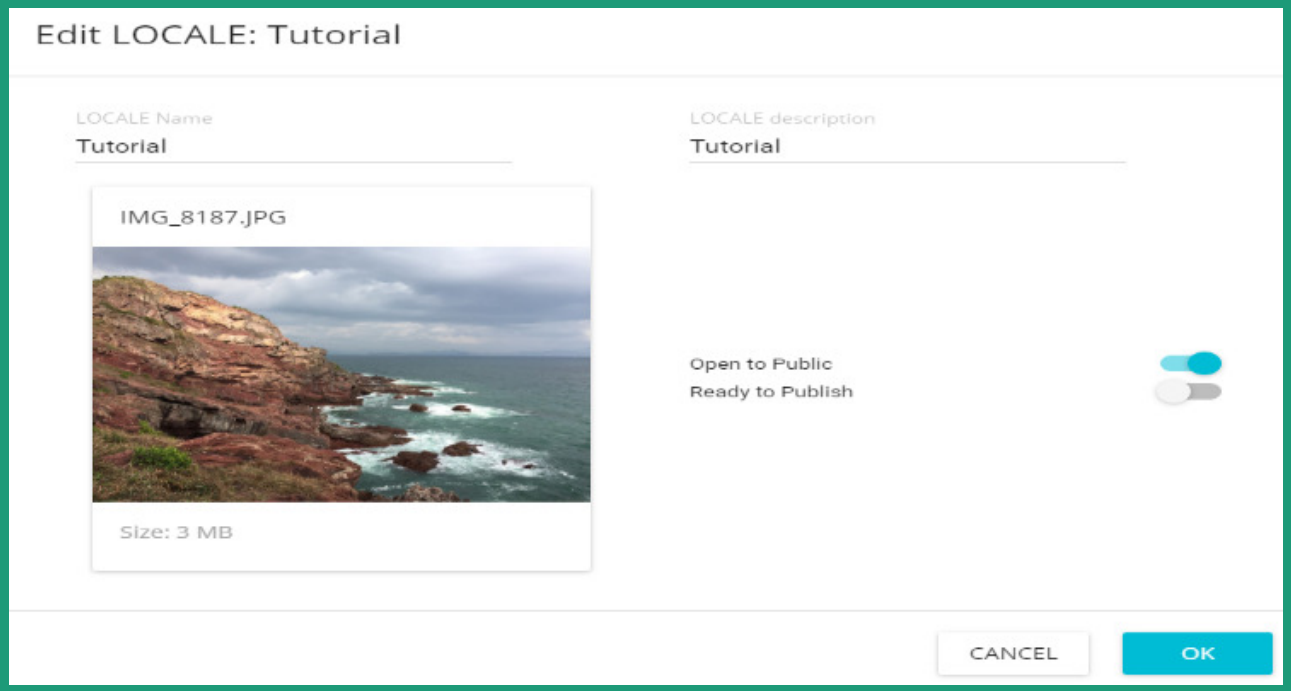
Upon successful creation of locale, a new locale (with the owner’s name, the locale’s name and the locale’s cover image) should appear in the main menu.

How to Edit a Locale

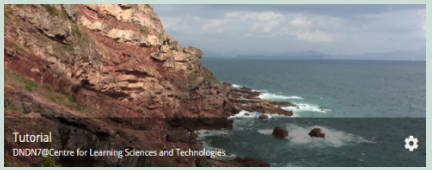
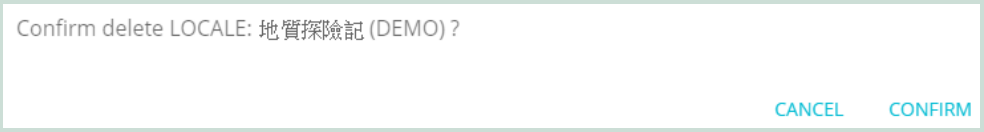
Step	Procedures	User Interface
1	Press the setting button at the right bottom corner.	
2	Press "View/Edit Detail".	
3	Edit the locale's name, description, public and publish settings. Press "OK" to confirm and "Cancel" to return.	

How to Edit a Locale

Step	Procedures	User Interface
UI		



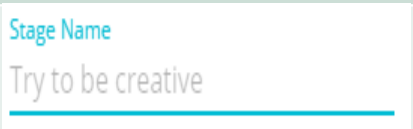
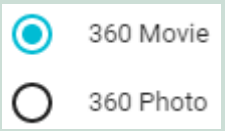
How to Delete a Locale

Step	Procedures	User Interface
1	Press the setting button at the right bottom corner.	
2	Press “Delete”.	
3	Press “Cancel” to return and “Confirm” to delete.	
UI		

Stages

- Stages are the building blocks of a locale.
- A stage can be a 360 movie or a 360 image.
- Inside a stage, teachers can add interactive elements such as tags, MCs and portals.

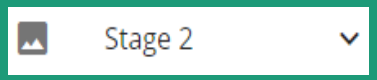
How to Create a Stage

Step	Procedures	User Interface
1	Press “Create New Stage”.	
2	Enter the stage’s name.	
3	Indicate 360 Movie / Photo (Default: 360 Movie).	

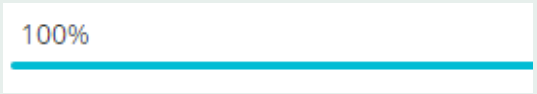
Upon successful creation, the new stage will appear on the left navigation bar.

How to Create a Stage

- The left navigation bar shows all the stages in sequence
- The right hand side allows teachers to upload their 360 movie / image

Icon	Meaning
	360 Movie
	360 Image

Upload 360 Movie / Image for a Stage

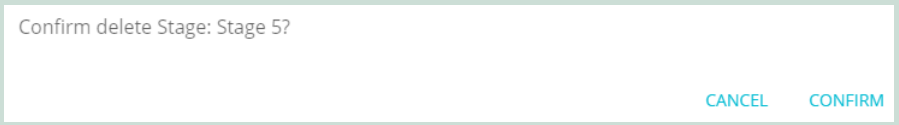
Step	Procedures	User Interface
1	Press "Upload". Movie: mov, mp4, m4v, avi Image: jpg, jpeg, png, gif	
2	Wait until 100% .	
3	Upon successful upload, teachers should be able to see the thumbnail and the timeline for the VR content.	
UI		

Edit a Stage

- Teachers can further edit the display sequence of stages using the left navigation bar.

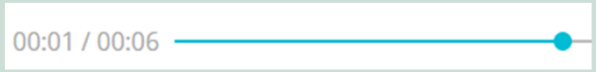
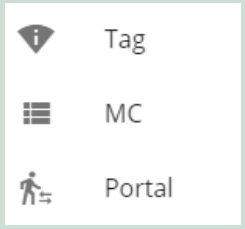
Step	Procedures	User Interface
1	Press the button.	
2	Press “Move Up” / “Down”.	

Delete a Stage

Step	Procedures	User Interface
1	Press the button.	
2	Press “Delete”.	
3	Press “Cancel” to return and “Confirm” to delete.	
UI		

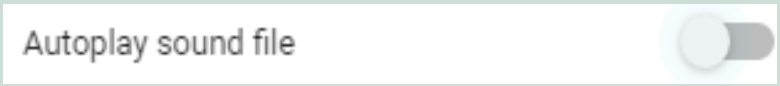
Playback Elements

- Teachers can add interactive elements in the VR world.
- They include tags, MCs and portals.

Step	Procedures	User Interface
1	Drag the timeline to indicate when the element should appear.	
2	Press "Element At This Moment"	
3	Choose the element: "Tag", "MC" or "Portal"	

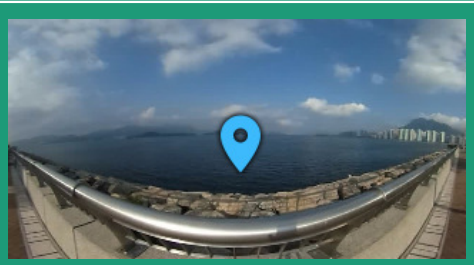
How to Create a Tag

•Tag can display information such as text, voice or enlarged image.

Step	Procedures	User Interface
1	Enter the display text.	
2	Choose the tag type.	
2a	For voice, upload an mp3. Toggle autoplay or not (Default: Off).	
2b	For image, upload these formats: jpg, jpeg, png, gif.	

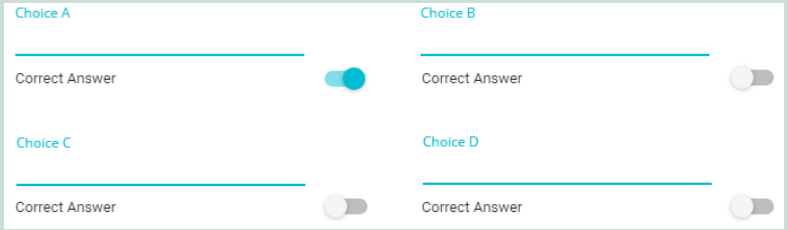
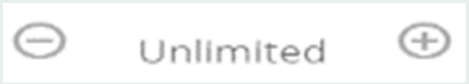
How to Create a Tag

- Tag can display information such as text, voice or enlarged image.

Step	Procedures	User Interface
3	Drag the pin to indicate where the tag should appear.	
4	Drag the timeline to indicate how long the tag should appear.	

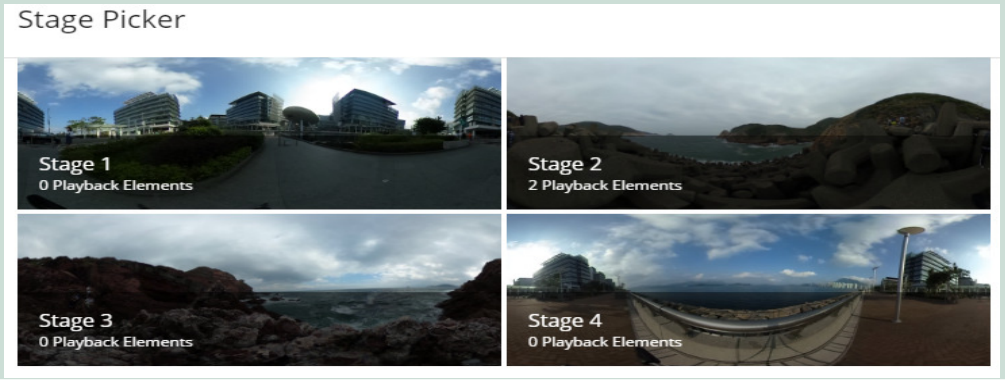
Create a MC

- Each MC has 4 choices and at least 1 correct answer.
- Teachers can limit how many times the students can attempt a MC.

Step	Procedures	User Interface
1	Enter the question.	
2	Enter the 4 choices and toggle at least 1 correct answer.	
UI		
3	Adjust how many times the students can answer this MC.	

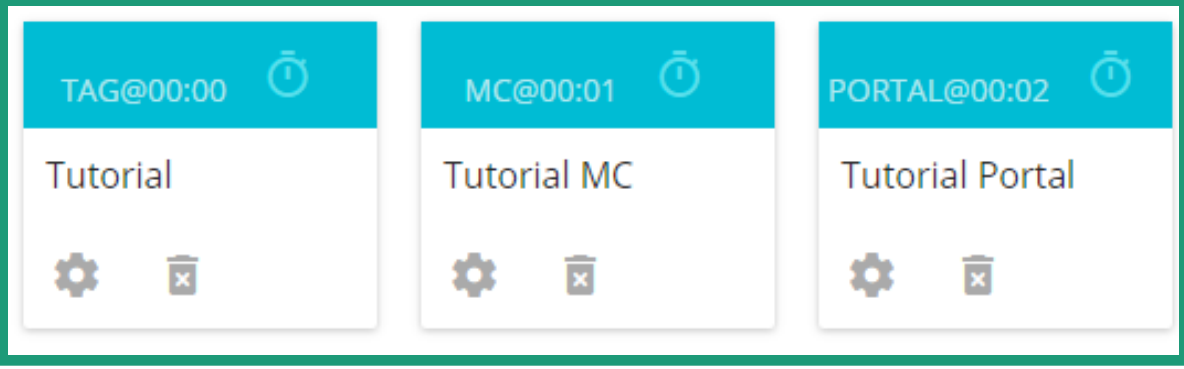
Create a Portal

- Portal is the transfer gateway to other stages.
- Teachers can set at most select 4 destination stages for a portal.

Step	Procedures	User Interface
1	Enter the display text, e.g., “To Stage 2”	Tell the user something about these portals
2	Pick the destination stages.	DESTINATION STAGE 1 DESTINATION STAGE 2 DESTINATION STAGE 3 DESTINATION STAGE 4
UI		

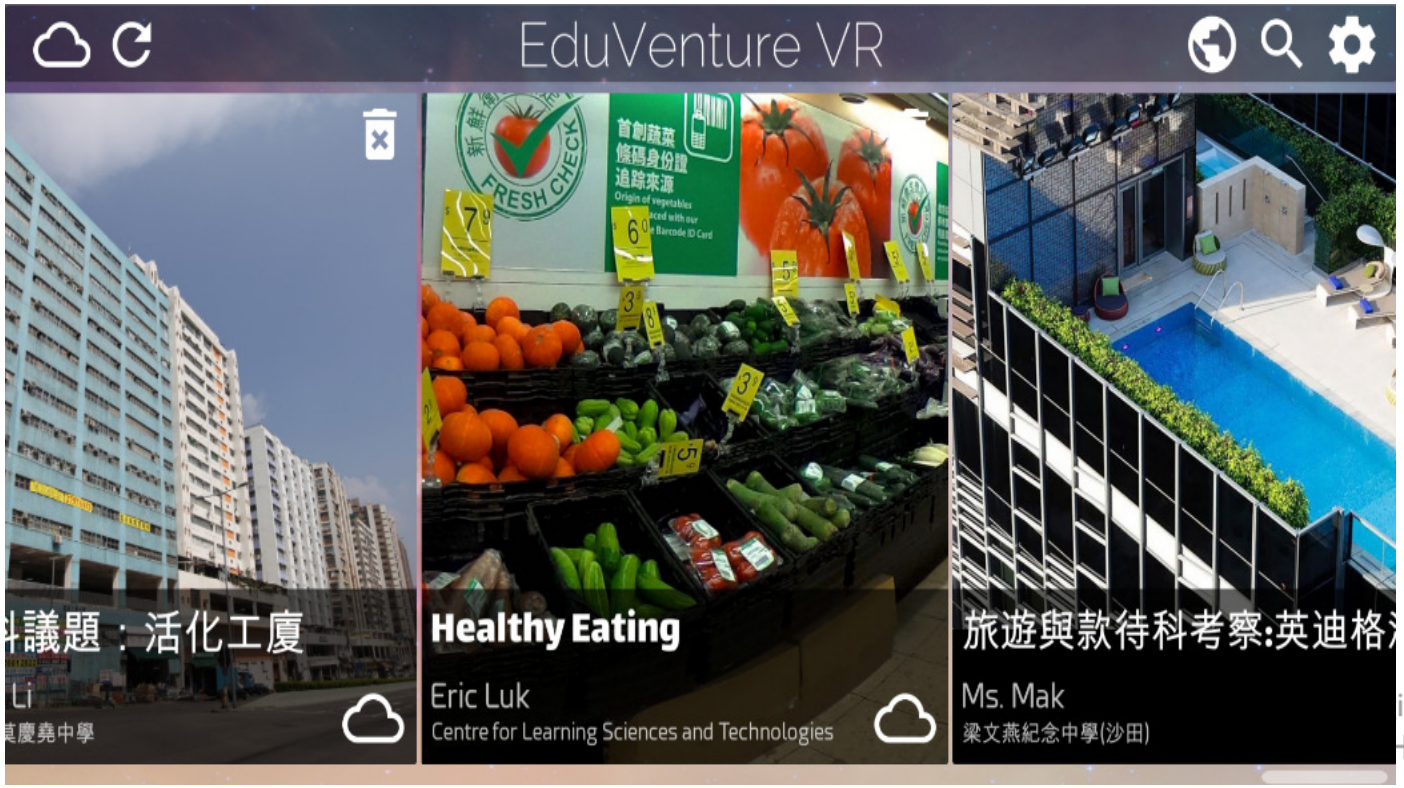
Review the Playback Elements

- Teachers can review the playback elements they added in the bottom panel.

UI		
Step	Procedures	
1	Press to edit the element.	Press to delete the element.

EduVenture VR App

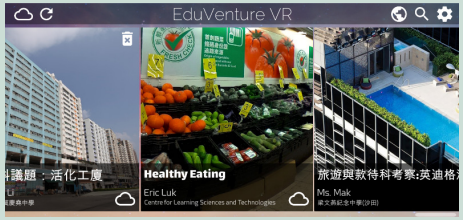
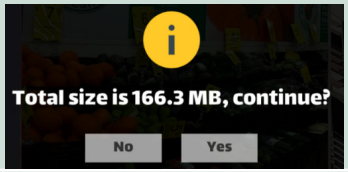
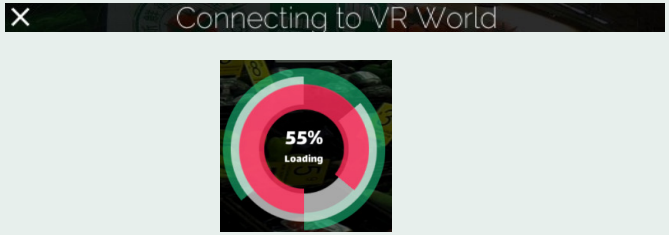
After installing the EVVR App, students should be able to see the locales that are set public and ready to publish in the composer.



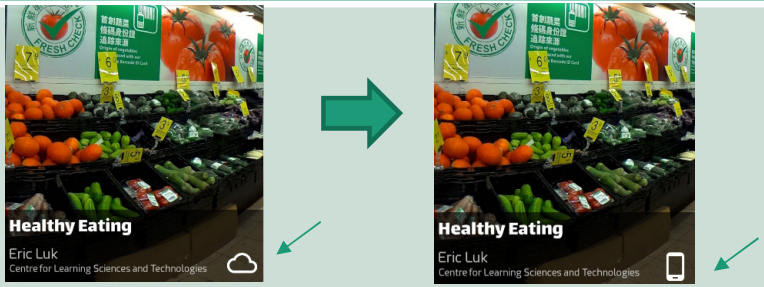
Control Panel

No.	Icons	Functions
1a		Display the online locales (Can switch to 1b)
1b		Display the downloaded locales (Can switch to 1a)
2		Refresh the locale menu
3a		Display all public locales (Can switch to 3b)
3b		Display private locales only (Can switch to 3a)
4		Search a particular locale
5		Configure game settings

Download a Locale

Step	Procedures	User Interface
1	Press the locale to download	
UI		
2	Press “Yes” to download and press “No” to return.	
3	Press ✕ to stop downloading if necessary. Otherwise, wait until 100% downloaded.	

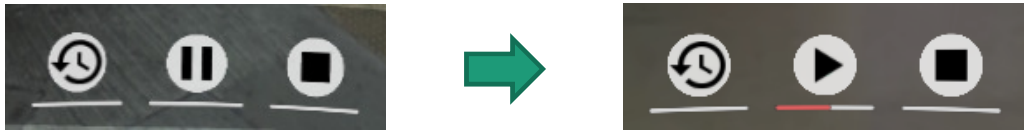
Download a Locale

4	Upon successful downloading, the students can start the locale! Note that the icon at the right bottom corner changes.
UI	

Inside the VR World

How to Reverse/Play/Stop the VR content

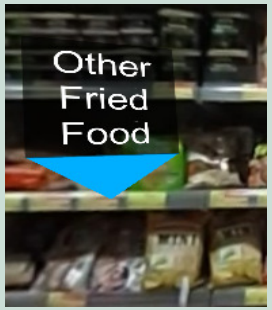
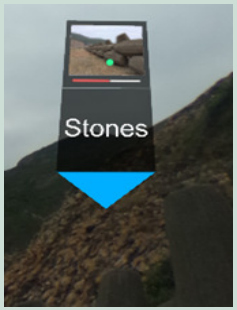
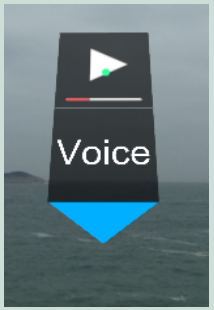
When the students look downwards, a control panel will pop up.



- There are 3 actions: **reverse, pause/resume and stop the 360 movie / image.**
- To perform these in the VR world, simply move the pointer to the button for 2 seconds.

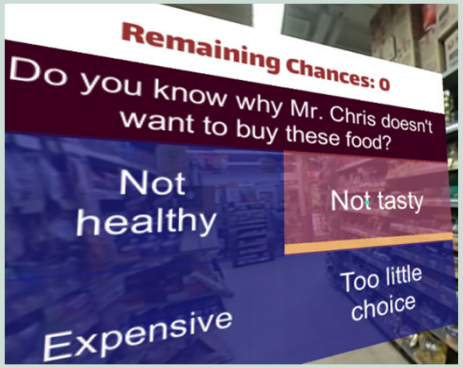
How to Respond to a Tag

Either text, image or voice tag will be displayed (according to the composer's database).

Type	None	Image	Voice
UI			
Step	Procedures		
1	N/A	Point to the thumbnail image for 2 seconds.	Point to the play button for 2 seconds.
2	N/A	An enlarged image will come out eventually.	The sound will be played eventually.

How to Respond to a MC

The number of chances, the MC question and the 4 choices will now be displayed (according to the composer's database).

Step	Procedures	
1	Move the pointer to the answer.	
2	Correct	Wrong
UI		

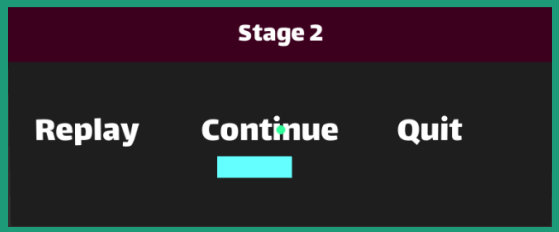
How to Respond to a Portal

Students can teleport to other stages through portal. The portal title and destination stages will now be displayed (according to the composer's database).

Step	Procedures
1	Move the pointer to the destination stage and wait for 2 seconds. The portal will then teleport to the destination stage.
UI	

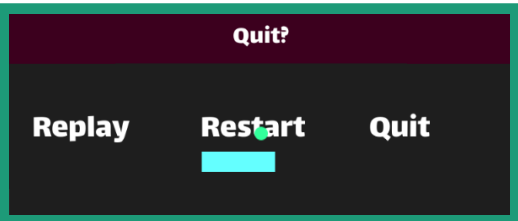
How to Continue to Next Stage

- After finishing a stage, a "Continue Panel" will pop up.
- The student can either replay, continue or quit, by moving the pointer to the option.

UI	
Actions	Meaning
Replay	Replay the current stage.
Continue	Go on to next stage.
Quit	Return to the main menu.

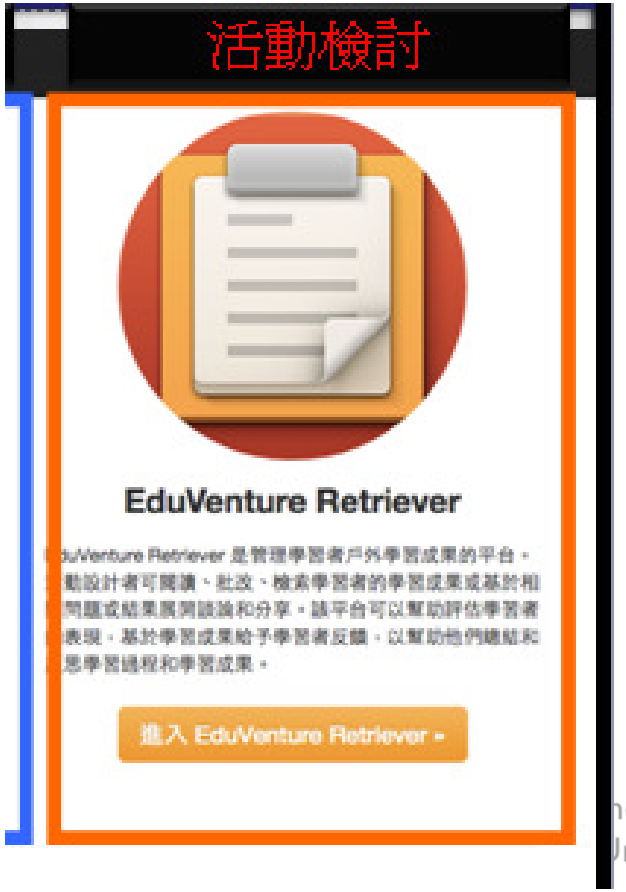
Quit Panel

- After finishing all stages, a "Quit Panel" will pop up.
- The student can either replay, restart or quit, by moving the pointer to the option

UI	
Actions	Meaning
Replay	Replay the current stage.
Restart	Restart from the first stage.
Quit	Return to the main menu.

(B) 簡述監測學生學習成效報告的工具與技術 (EduVenture Retriever)

2.4 簡述監測學生學習成效報告的工具與技術 (EduVenture Retriever)



2.4 簡述監測學生學習成效報告的工具與技術 (EduVenture Retriever)

考察名稱	用戶名稱	學校/團體	最後更新	答案數量
Eduventure X Lesson	Wallace Man	EduVenture 共享社群	2015-01-02	0

請選擇考察日期

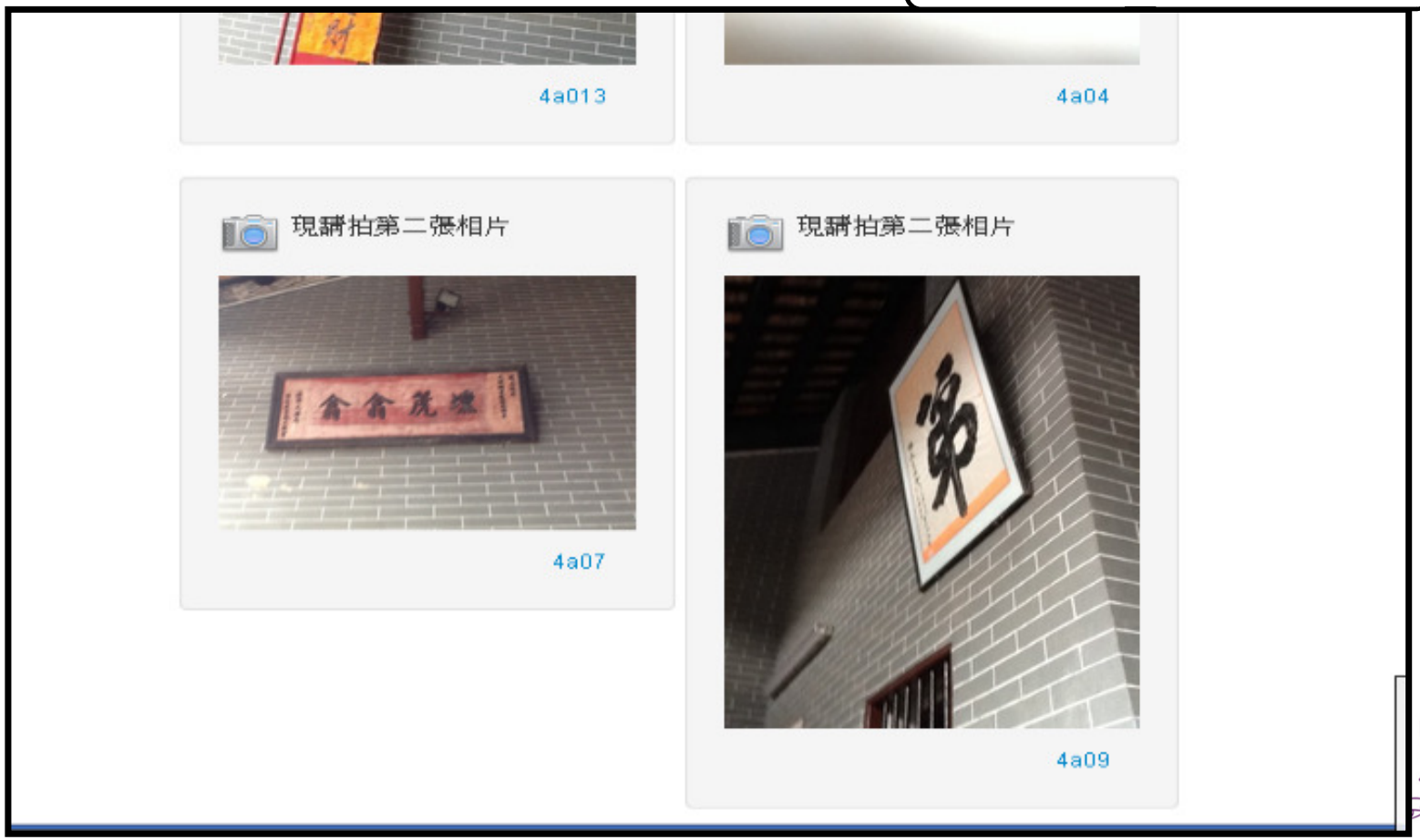
日期	遞交數量
2014-12-11	2
2014-12-10	67

2.4 簡述監測學生學習成效報告的工具與技術 (EduVenture Retriever)

以學生為單位

2.4 簡述監測學生學習成效報告的工具與技術 (EduVenture Retriever)

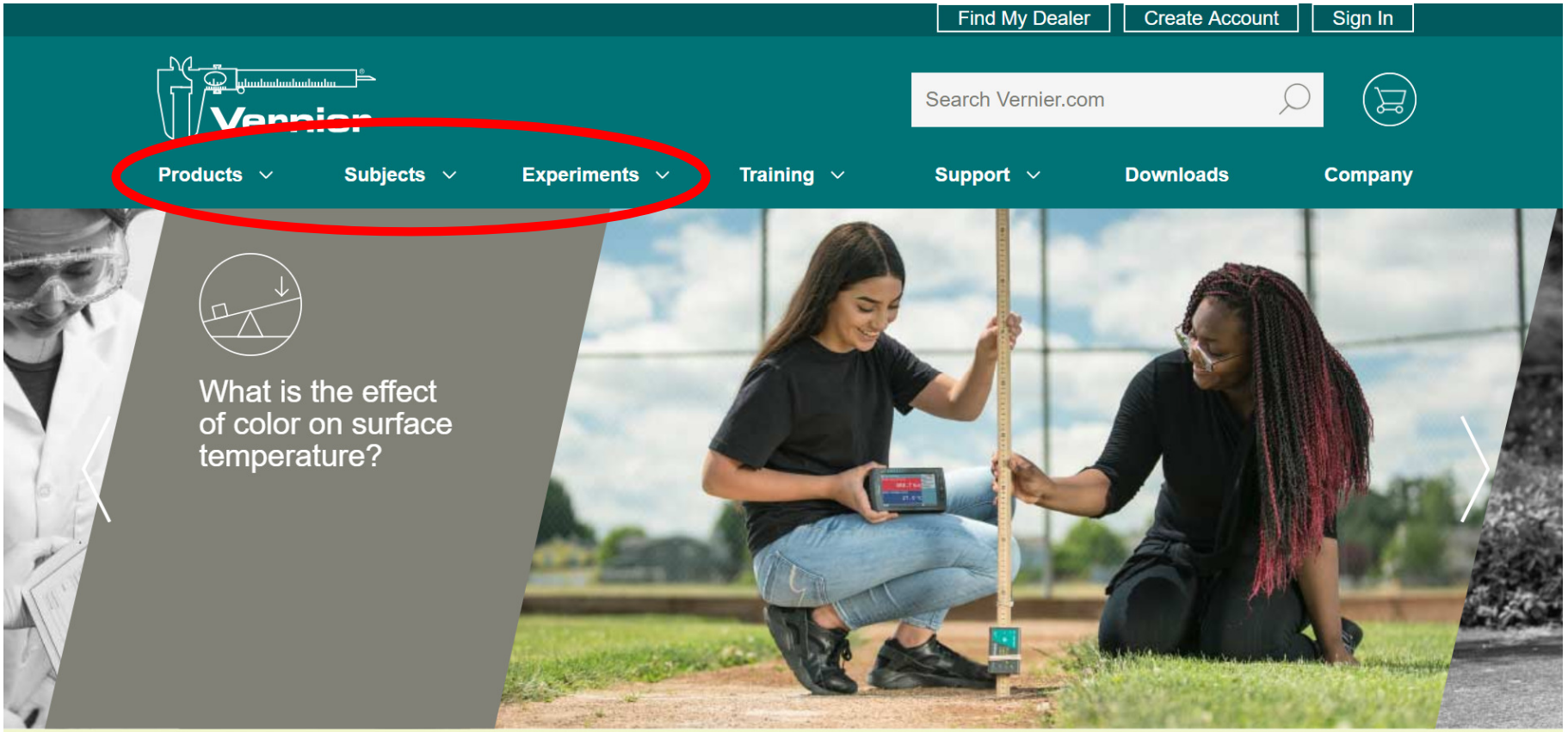
以題目為單位



課程大綱

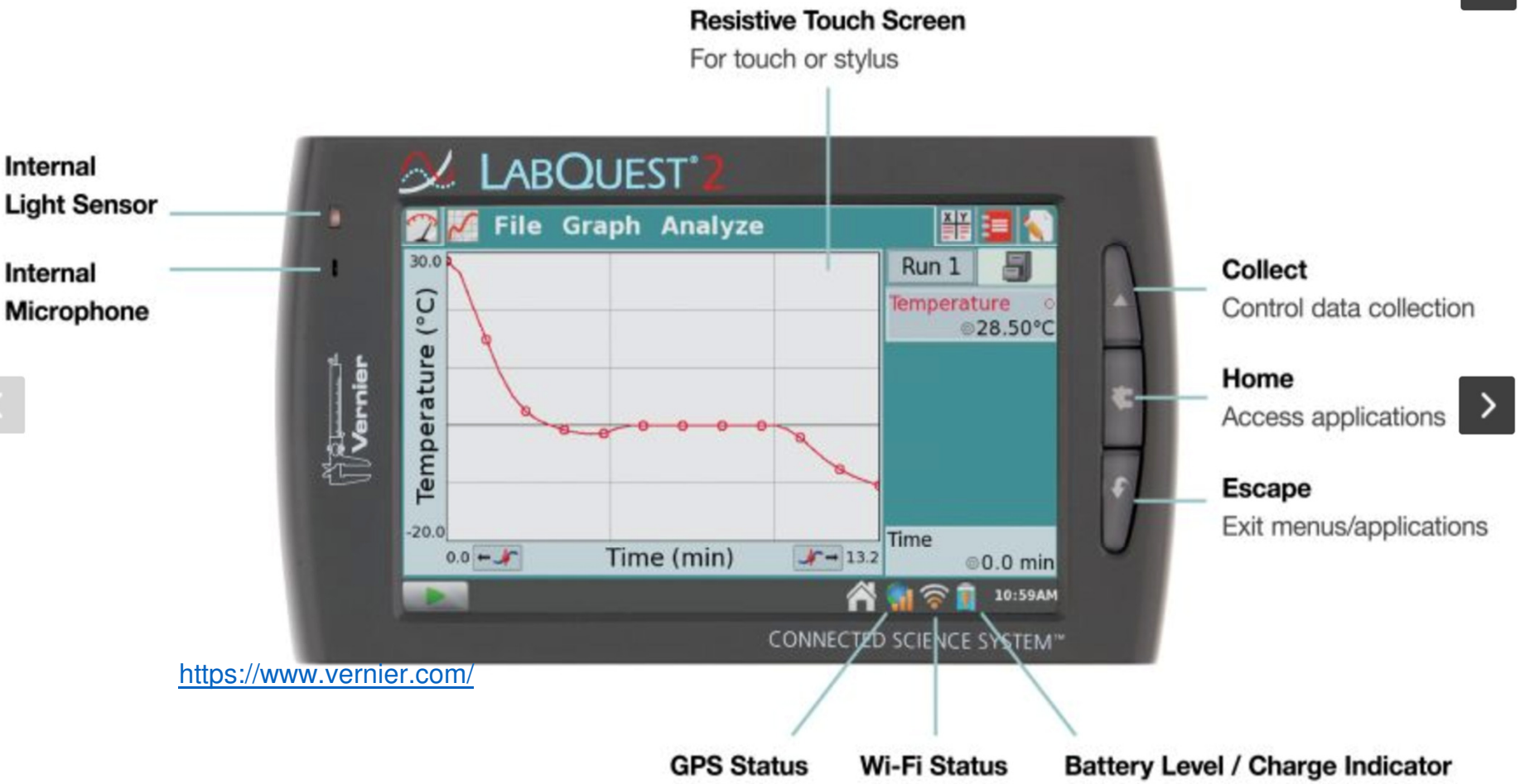
- 第二節：
  - 2.1 課業討論及回饋；
  - 2.2 運用EduVenture Composer創建地圖數據/熱點和多媒體內容；
  - **2.3 介紹用於環境調查的電子傳感器；**
  - 2.4 不同科目運用移動學習的教學案例之討論；
  - 2.5 賬戶管理和設備的安排；
  - 2.6 介紹移動學習活動的替代方案；
  - 2.7 課程總結

2.3 介紹數碼傳感器和便攜式數據採集儀器，以進行有關移動學習的探究



https://www.vernier.com

數碼傳感器和便攜式數據採集儀器



https://www.vernier.com/

數碼傳感器和便攜式數據採集儀器

Two Digital Ports
For use with motion detectors, photogates, drop counters, and more.

USB Port
For USB sensors, flash drive, or other USB peripherals.

Three Analog Ports
For use with 60 compatible sensors such as temperature, pH and CO_2 sensors.

數碼傳感器和便攜式數據採集儀器

Power
Use with AC or recharge LabQuest's lithium-ion battery

Mini USB
Connect to a Windows or Macintosh computer to collect data using Logger *Pro*

Storage
Micro SD / MMC Card to expand your storage capability

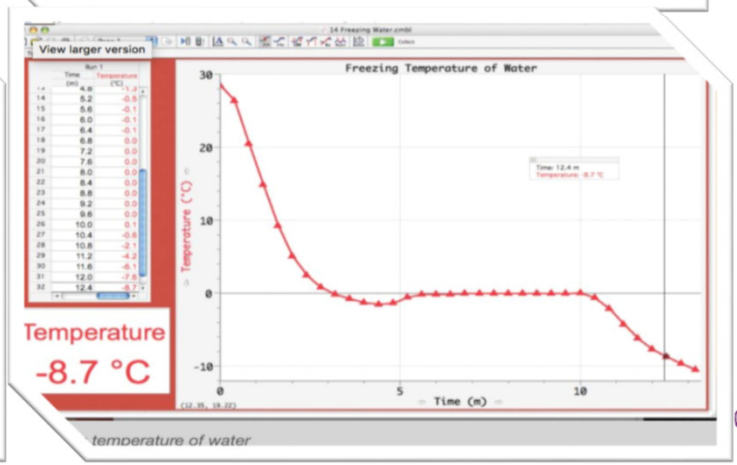
Audio In, Audio Out
Connect speakers, microphone, power amplifier or headphones

Connected Science System – data sharing

- Use Data Sharing to wirelessly view, collect, analyze, and share experimental data.
- Stream to mobile devices such as Chromebook™ notebooks, iPad®, and Android™ tablets for hands-on, collaborative learning with individualized accountability.

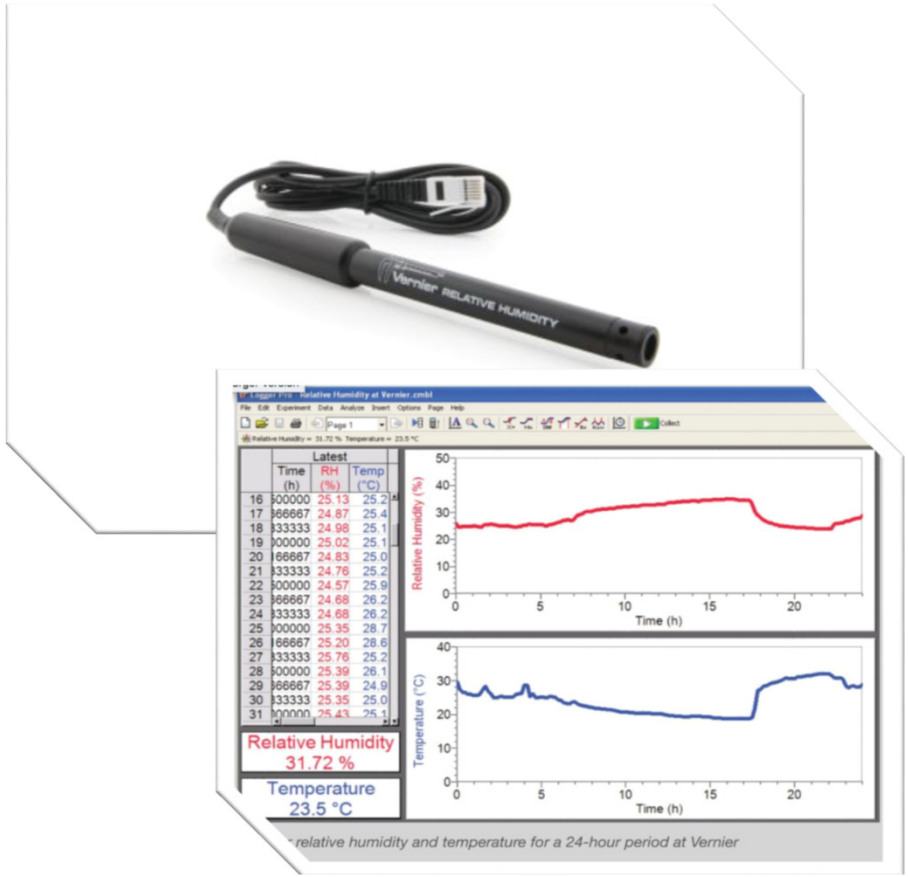
數碼傳感器和便攜式數據採集儀器

- Stainless Steel Temperature Probe 不銹鋼溫度傳感器

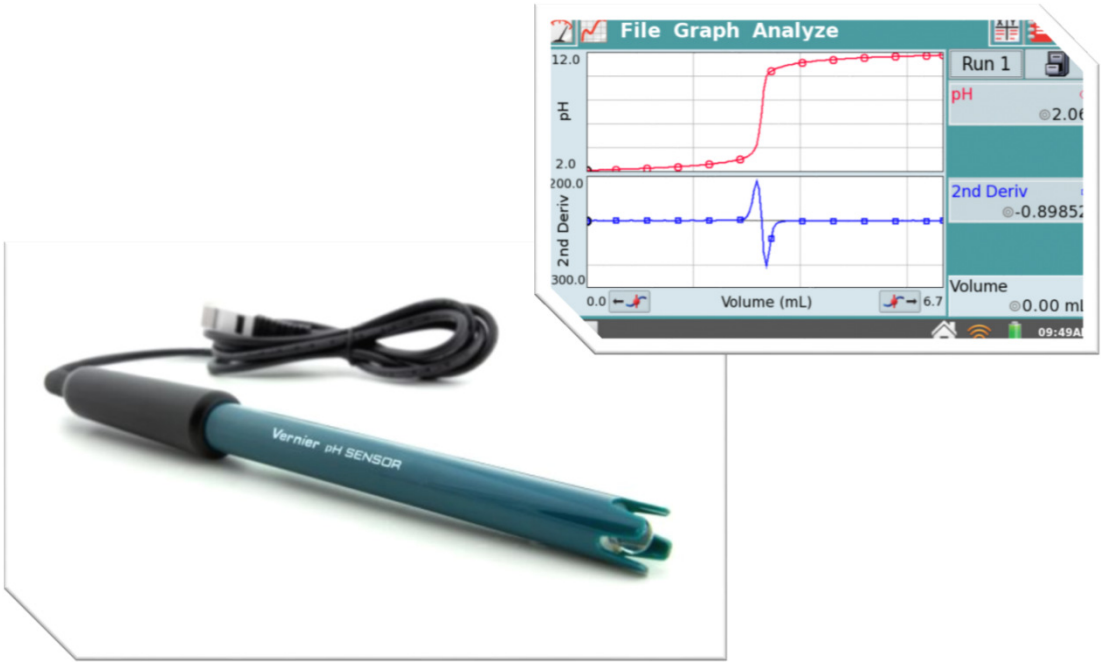


數碼傳感器和便攜式數據採集儀器

- Relative Humidity Sensor
  相對濕度傳感器

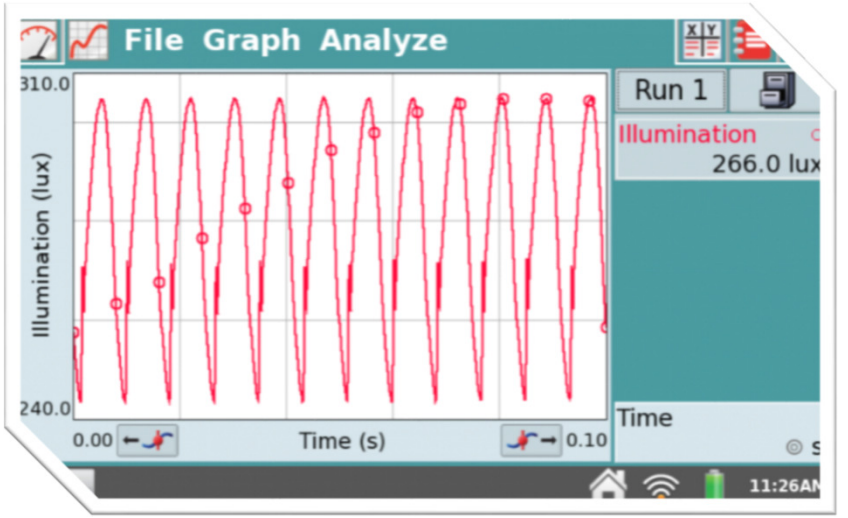


- pH Sensor
  酸鹼度傳感器



數碼傳感器和便攜式數據採集儀器

- Light Sensor 光強傳感器



2.3 介紹數碼傳感器和便攜式數據採集儀器，以進行有關移動學習的探究

香港教育大學
The Education University of Hong Kong

http://www.yottkpps.edu.hk/download/file/pressRelease/20190314111050056257 7.pdf

(1) 專題研習：空氣污染

A. 預期學習成果

學生能夠運用 micro:bit 微控制器編程，連接傳感器製作可攜式空氣質素探測器，並置放於學校課室、校外的馬路旁及巴士站獲取數據進行對照實驗，最後提出改善空氣污染的方法。

B. 教學流程

利用情景，引入專題研習，並請學生探究香港空氣污染的來源。

學生搜集報章，了解空氣污染對香港所帶來的影響。

學生網上搜尋資料，了解在香港常見的空氣污染物及空氣質數健康指標。

電腦科老師於課堂上教授學生運用 micro:bit 編程及接駁電子元件。

常識科老師於課堂上與學生製作及改良空氣質素探測器。

學生利用所製作的探測器，測量和記錄校內外空氣質素。

總結：就專題研習進行反思，建議改善空氣污染的方法及進行匯報。

土壤濕度探測活動

六年級同學在make code 平台編寫程式，配合micro:bit製作土壤濕度探測器，收集數據為盆栽澆水。

利用micro:bit收集土壤濕度數據

課程大綱

- 第二節：
  - 2.1 課業討論及回饋；
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  - 2.6 介紹移動學習活動的替代方案；
  - 2.7 課程總結

2.4 不同科目運用移動學習的教學案例之討論；

EduVenture®戶外教材設計比賽 得獎作品

各得獎作品現已於 EduVenture® X應用內開放供所有用戶下載。
有意使用的老師可以關鍵字(Keyword)搜尋，或利用「最後更新」排序下載所需要的作品。

小學組 得獎作品

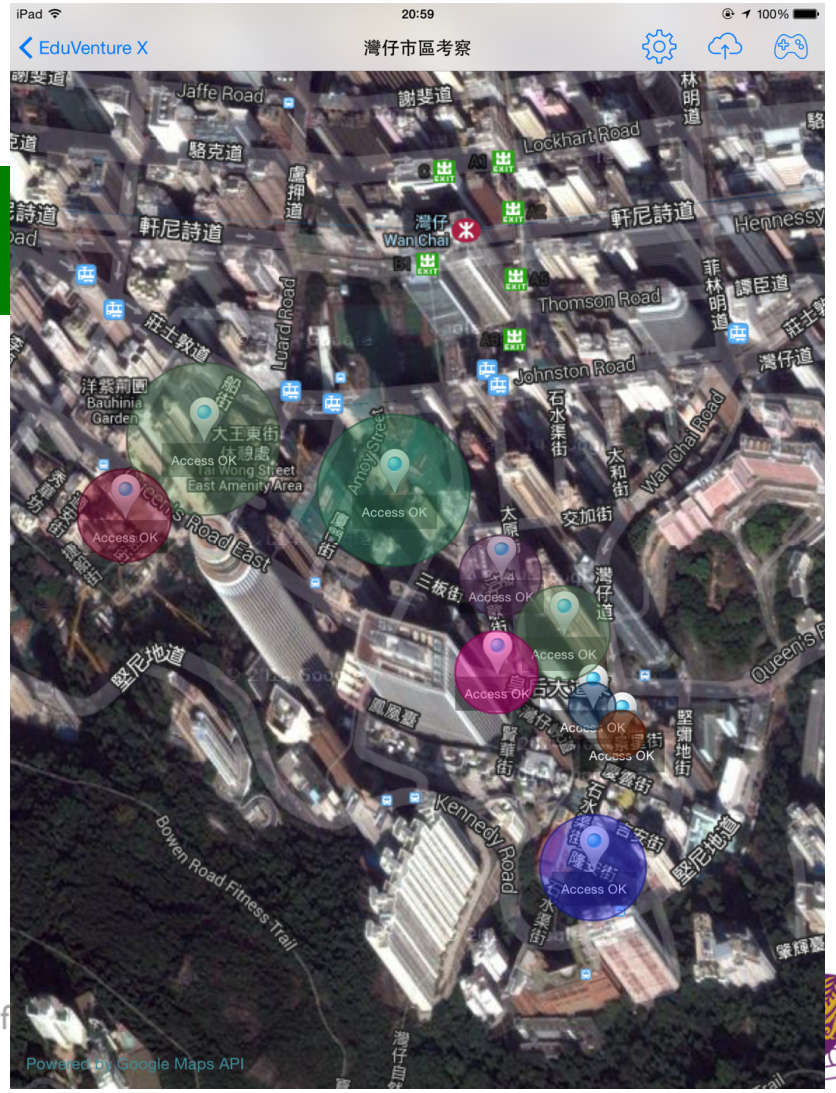
冠軍	亞軍	季軍
油麻地、佐敦(官涌)街道文化探秘之旅 黃毅娟 劉蕙茵 林欣瑋 嗇色園主辦可立小學	Tree Project - 認識樹木環保行 吳宇傑 祖堯天主教小學	DCFWMS—步行籌款暨生態探究遊 鄧家棟 胡素貞博士紀念學校

其他教學案例

灣仔市區更新

目的：掌握市區更新的三個策略

- 復修
- 重建
- 活化



灣仔市區更新

- 景點一：北帝廟
- 景點二：藍屋
- 景點三：QUEENS CUBE
- 景點四：灣仔舊街市
- 景點五：灣仔舊郵局
- 景點六：太原街市集
- 景點七：利東街（囍帖街）
- 景點八：和昌大押
- 景點九：船街

ONE 壹環
WAN CHAI ROAD

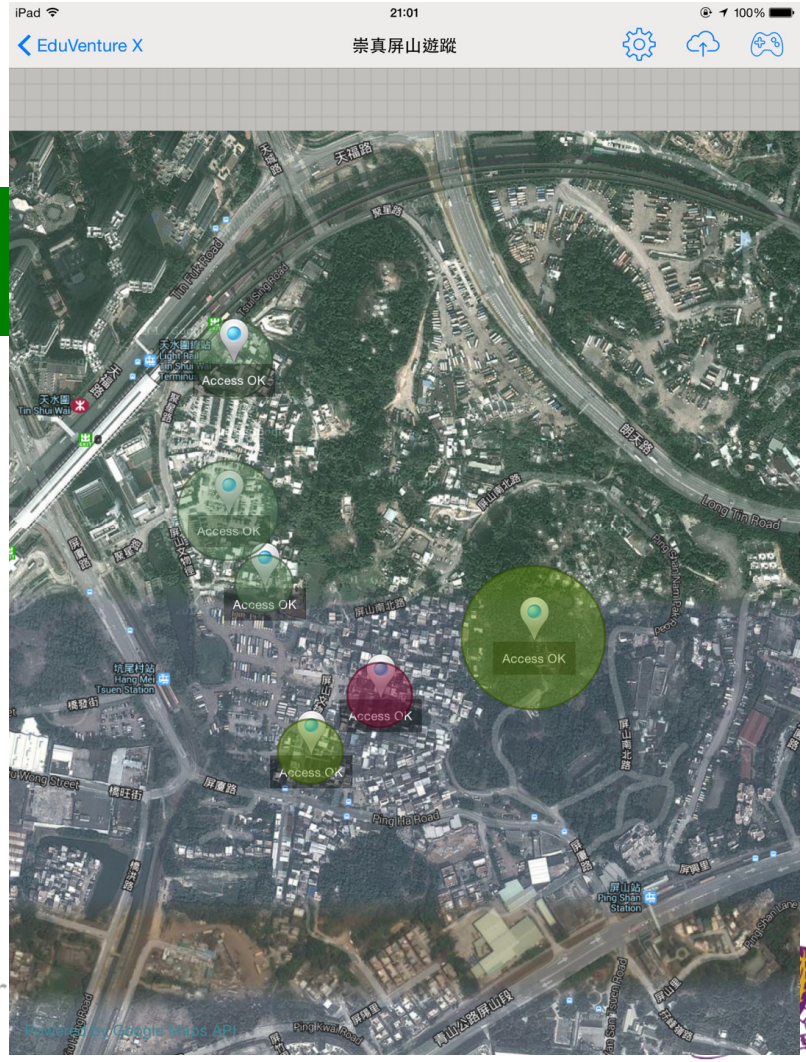
環境資源中心
ENVIRONMENTAL RESOURCE CENTRE

其他教學案例

坪山文物徑

目的：認識經濟發展　與文化保育的平衡

- 可持續發展概念



坪山文物徑

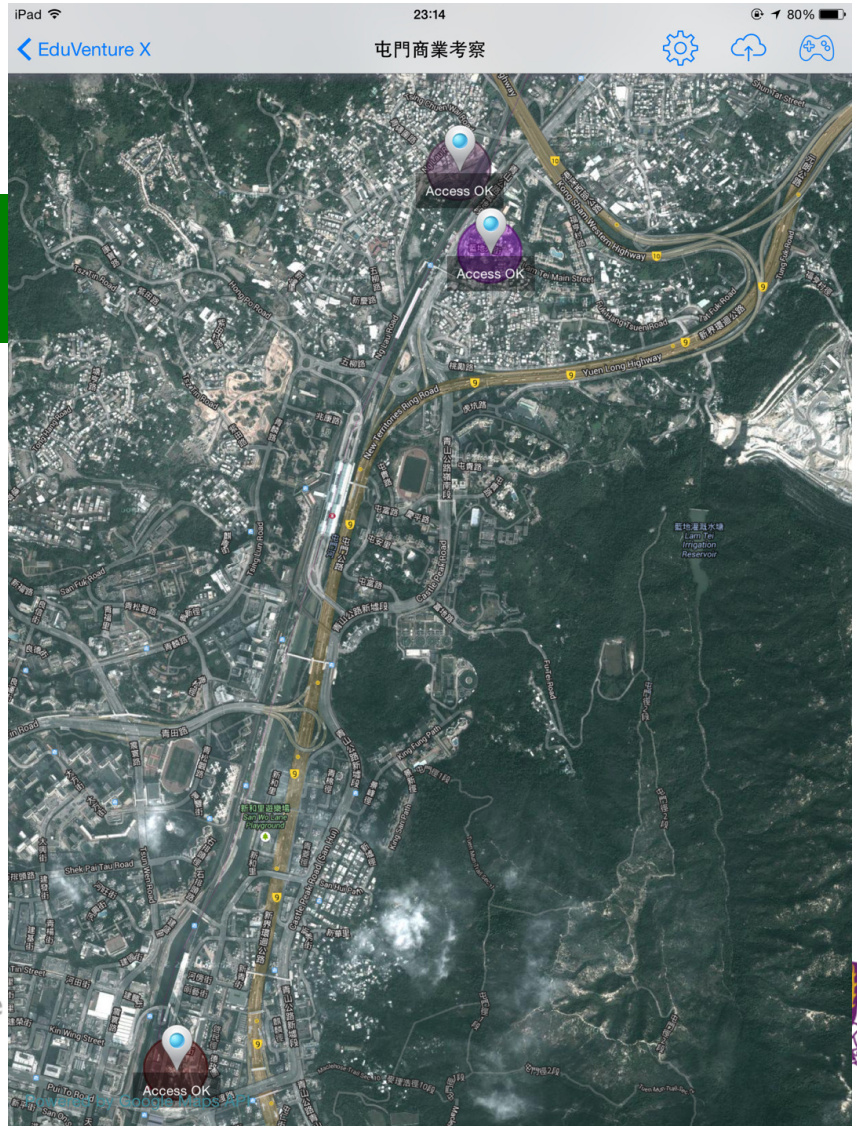
- 景點一：聚星樓
- 景點二：上璋圍
- 景點三：古井
- 景點四：鄧氏宗祠
- 景點五：覲廷書室
- 景點六：鄧氏博物館

鄧氏宗祠
東漢啟勳
南陽承世澤

其他教學案例

屯門商業考察

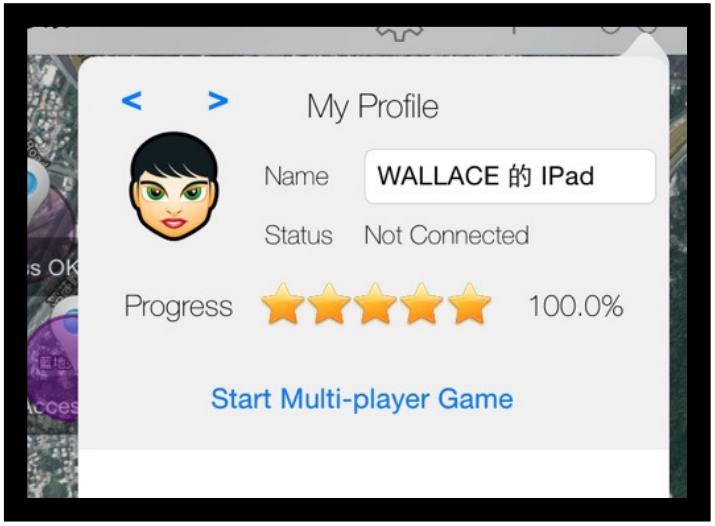
- 目的：探討屯門城市發展與文化保育的平衡
- 景點一：青磚圍
- 景點二：魚塘與農地
- 景點三：VCITY



課程大綱

- 第二節：
  - 2.1 課業討論及回饋；
  - 2.2 運用EduVenture Composer創建地圖數據/熱點和多媒體內容；
  - 2.3 介紹用於環境調查的電子傳感器；
  - 2.4 不同科目運用移動學習的教學案例之討論；
  - **2.5 賬戶管理和設備的安排；**
  - 2.6 介紹移動學習活動的替代方案；
  - 2.7 課程總結

2.5 賬號管理與活動後勤措施



- 必須具備真名稱
- 可考慮使用班別學號

Email:	clst@fed.cuhk.edu.hk
Postal Address:	Centre for Learning Sciences and Technologies, The Chinese University of Hong Kong, Shatin, Hong Kong. 香港 沙田 香港中文大學 學習科學與科技中心
Office Address:	Room 610A, Chen Kou Bun Building, The Chinese University of Hong Kong, Shatin, Hong Kong. 香港 沙田 香港中文大學 陳國本樓610A室
Tel:	(852) 3943 3298

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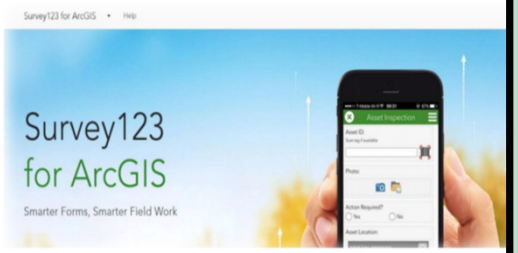
  - 2.7 課程總結

2.6 介紹移動學習活動的替代方案

Google
Google Form with QR Code

Esri 美國環境系統研究所公司
Survey 123



詳情及製作手冊看參閱附件

運用Google Applications

- Google Maps
  https://www.google.com/maps
- Google Earth
  https://www.google.com/intl/zh-HK/earth/
- Google Street View
  https://www.google.com/streetview/

運用Google Applications

- Google Art and Culture
  https://artsandculture.google.com/

Google Expeditions

- Google Expedition
  https://edu.google.com/products/vr-ar/expeditions/

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支援機構/服務

香港特別行政區政府
教育局
GoVHK香港政府一站通
简体版 ENGLISH
流動 / 無障礙瀏覽版本
我的自訂色彩 AAA
主頁
最新消息
有關教育局
新聞公報
教育制度及政策
課程發展
學生及家長相關
教師相關
學校行政及管理
公共及行政相關
公開資料
聯絡我們
主頁 > 課程發展 > 學習領域 > 數學教育 > 教學資源
教學資源 - STEM示例
小學
設計及製作大樓模型
橡皮筋動力車
四季
杯子打印
多邊形製作
健康飲食 (食鹽的攝取量)

香港特別行政區政府
教育局
港政府一站通
简体版 ENGLISH
流動 / 無障礙瀏覽版本
我的自訂色彩 AAA
主頁 > 教育制度及政策 > 小學及中學教育 > 小學及中學教育適用 > 資訊科技教育
資訊科技教育卓越中心
學校特色
簡介 | 中學 | 小學 | 特殊學校 | 專業發展課程 | 學校名單 | 到校支援申請表
簡介
教育局每年透過有關教師借調計劃的通函邀請各官立及資助中學、小學、特殊學校及直接資助計劃
中心計劃。每所參與的學校須提名兩名現職教師擔任兼職借調教師，為此學校會獲發津貼用作聘任
擔。
借調教師的主要職責包括：

STEM UP
毫宇創科・盡在現代

培生
STEM
Plus
培生 STEM Plus 包括「資科探」Science Explorer、「做創客」STEMaker 及「學編程」STEMCoder 三部分。架構經過精心規劃，活動由淺入深，逐步引導學生發揮 STEM 潛能。

CLASSROOM
STEAM
EDUCATION
Kindergarten . Primary .

mc 名創教育
小學常識
新識世界網

邀請資訊科技教育卓越中心借調老師到校支援服務申請表

http://www.edb.gov.hk/tc/edu-system/primary-secondary/applicable-to-primary-secondary/it-in-edu/support.html

Q & A?