

知識經濟時代之圖書館服務系列23
翻轉教育ing～圖書館翻轉吧！

翻轉教育在圖書館的應用



童敏惠
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2016. 4.22@國立成功大學圖書館

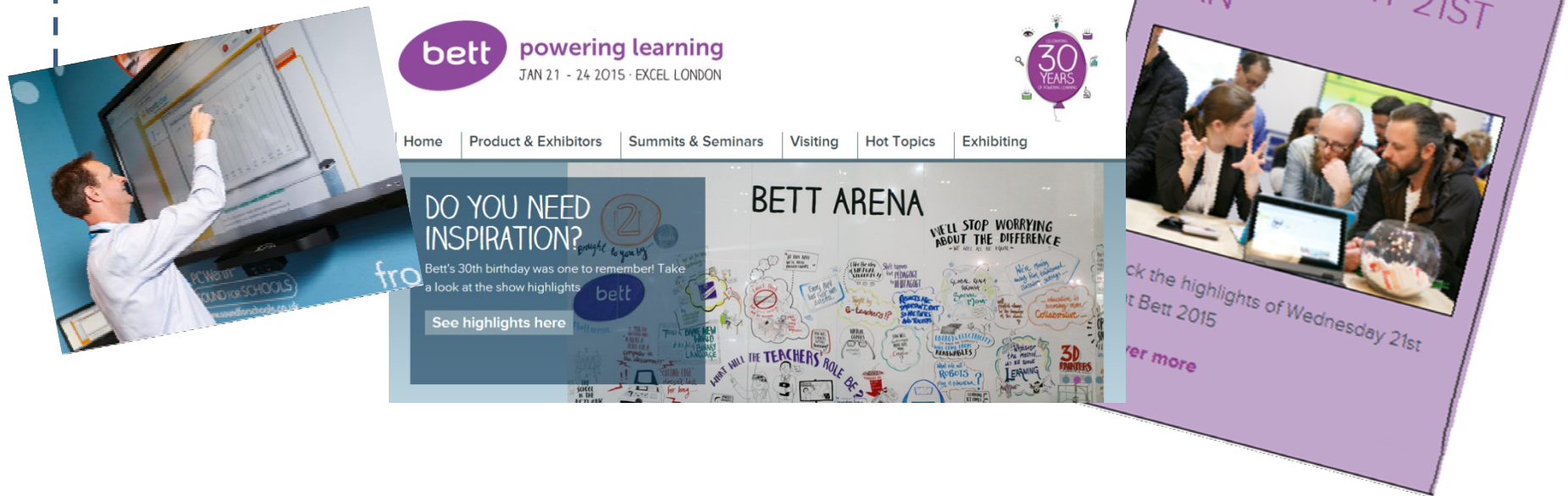
大綱 *Outline*

- 從 BETT 和 Horizon Report 看
教育科技發展的趨勢
- 教學與學習趨勢
- 翻轉教學在圖書館的應用
- Q&A



英國教育科技展 (BETT, British Educational Training and Technology Show)

- 每年1月下旬在英國倫敦舉行
- 約有 600 多家廠商展出硬體相關設備、教學與行政管理軟體、線上學習資源、基礎架構與網路設備等最新教育科技產品與應用服務



英國教育科技展之高等教育論壇

2014年高等教育之議題：

- 如何掌握大學生的期望
- 如何應用科技於教學及學習

Newcastle大學

Integrated programmes for pedagogical change

Steve Williams: Using Technology to Improving Learning



Steve Williams, Director of Information and Services at Newcastle University

學生期望與學習
經驗之調查研究

Managing student expectation

Student expectation has never played a more

city decision-making. The

placed an

to respond to

provide a

Whether it's

in devices to

support or personalising

on universities to deliver is

immense when it comes to technology. View a

selection of videos from the January 2013 Summit.

Developing a student-centred approach to education

<http://www.youtube.com/watch?v=kO4NMY3u5M&list=PLtpDOBEKSMk4RDnK913I7dnDx-yVOMiua>

£9k fees and the National Student Survey

How to Manage Student Expectation of £9k Fees

Higher Education



A panel led by Julian Drinkall on rising student expectations and how to manage them

整合教學專家、學生、IT人員及行政人員，共同討論如何應用科技增進學生經驗、教學，以及空間的改造等

Source: <http://www.bettshow.com/Content/Technology-in-Higher-Education-Summit>

BETT 2015 高等教育論壇

Technology in Higher Education Summit



TECHNOLOGY
IN HIGHER
EDUCATION

TOP THEMES 2015

- **Future-proofing your university:** meeting the next generation of student expectations
- **The changing landscape of technology** in Higher Education
- **Behaviour change:** creating a community to encourage educators to adopt technology and change pedagogy.
- **Business forum:** maintaining your institution's competitiveness
- **Mobile technology:** Utilising and integrating to improve teaching and learning

重要議題

- 迎向未來學生的期待
- 高等教育中科技的改變
- 教學典範的改變
- 確保機構的競爭力
- 行動科技在教學和學習的應用

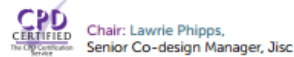
Source: <http://www.bettshow.com/Content/Technology-in-Higher-Education-Summit>

高等教育趨勢

從多場研討會
主題，可看出
教育趨勢



Day one: Wednesday 21 January



Enhancing the learning of students

| | |
|---------------|---|
| 10.30 – 11.15 | The changing landscape of technology in higher education Toni Sant, Education Organiser, Wikimedia Paul Clark, Director of Policy, Universities UK Peter Tinson, Executive Director, UCISA Simon Nelson, CEO, FutureLearn |
| 11.25 – 12.10 | Assessing the role of social media in higher education: #goodorbad Panel: Professor Andy Miah, Chair in Science Communication and Digital Media, University of Salford Santanu Vasant, Educational Technologist, City University Rosie Miles, Reader in English Literature and Pedagogy, University of Wolverhampton |
| 13.10 – 13.40 | Reliable assessment for the 21st century Richard Kimbell, Professor & Director: Technology Education Research Unit, Goldsmiths, University of London |
| 14.15 – 15.00 | Future-proofing your university: Meeting the next generation of student expectations Panel: Amelia Vegting, Year 13 Student, Serpton High School Kamran Malek, Year 13 Student, Serpton High School for Boys |
| 15.15 – 15.45 | The internet of things, big data and future learning Professor Andy Miah, Chair in Science Communication and Digital Media, University of Salford |
| 16.00 – 16.30 | Quick fire: Innovation, teaching and learning Joe Reddington, Researcher Jill Barber, Reader in Pharmacy, University of Manchester David Lefevre, Director of the Educational Technology Unit, Imperial College Business School |

Assessment

Learning Analytics

Higher education and further education

Day one: Wednesday 21 January



| | |
|---------------|---|
| 10.15 – 10.55 | Managing the MOOC classroom Chris Cavey, Product Development Consultant, British Council Eleanor Clements, Learning Content Development, British Council |
| 11.00 – 11.15 | Education, always on... Removing the educated guesswork from education IT infrastructures David YC, Global Solution Offer Manager, IT Business, Schneider Electric |
| 11.30 – 12.15 | The benefits for lecturers in joining a MOOC Dr Christina Preston, Founder of the MirandaNet Fellowship, Professor of Educational Innovation, University of Bedfordshire Dr Sarah Younie, Reader in Education, Innovation & Technology, De Montfort University |
| 13.30 – 14.15 | Creating innovative learning spaces Costa Calcanis, E-Learning & Innovation Manager, Redbridge College |
| 14.30 – 15.25 | Moodle and Microsoft: Better together Jason Cole, CEO, Remote-Learner.net, Inc. Doug Mahugh, Senior Technical Evangelist, Microsoft Open Technologies, Inc. |
| 15.30 – 16.00 | Micro learning in the learning intensive society Martin H. Andresen, Learning Project Manager, BI Norwegian School of Business |
| 16.15 – 16.30 | Reinventing the personal learning environment: Mobile, visual and information-centric experience Sergey Zabaluev, Business Development Director, Infolio |
| 16.45 – 17.15 | A framework for TEL support implementation Timos Almpanis, Learning Technologist, Southampton Solent University |

MOOC

Mobile

Bett 2016 高等教育論壇

<http://www.bettshow.com/Content/Technology-in-Higher-Education-Summit>



TECHNOLOGY
IN HIGHER
EDUCATION

In association with: Communications Partner:



Created for Higher Education Professionals

Key themes for 2016 include:

- > **Legalisation changes:** Strategies reacting to the removal of caps on student numbers
- > **Mobile technology:** Utilising and integrating to improve teaching and learning
- ➔ **Enhancing student engagement and satisfaction:** Case studies from your peers
- ➔ **Innovative teaching styles:** Best practice of flipped learning, blended learning, team-based learning and game based learning
- > **Student voices:** Hear from undergraduates and Year 13 students on what they want from universities

關注之議題

SEE THE TECHNOLOGY IN HE PROGRAMME



Our HE visitors are aiming ever higher

This year, **over 5,000 of our visitors were from the higher education sector**, which includes a huge 202% increase in higher education leaders. To ensure we fully support this audience and encourage even more higher education professionals to find their answers and inspiration at Bett, we are running dedicated higher education seminar content.



Key themes to be addressed

討論之關鍵主題

Align your
Technology
Student e

> **Rethinking learning spaces** – in response to increasing numbers of students, many HE visitors come to Bett to look for furniture suppliers and architects to help them reinvent their campus

Higher Ed

Become a

This is a u
and exper

Both sum
that com

Key them

> **Blended learning and flipped classroom** – this new teaching and learning format will take some getting used to and people look to Bett for support

> Rethink

Bett to

> Blended

used to

> **Innovative tech** – people not only want to know what's new, but how to incorporate it in their environment

> **Distance learning** – universities are aiming to globalise and restrictions on international students entering the country means that they have to explore creative ways of tapping into this market.

> Innovative tech

environment

> Distance learning

the country

means that

they have to

explore creative

– people not only want to know what's new, but how to incorporate it in their environment

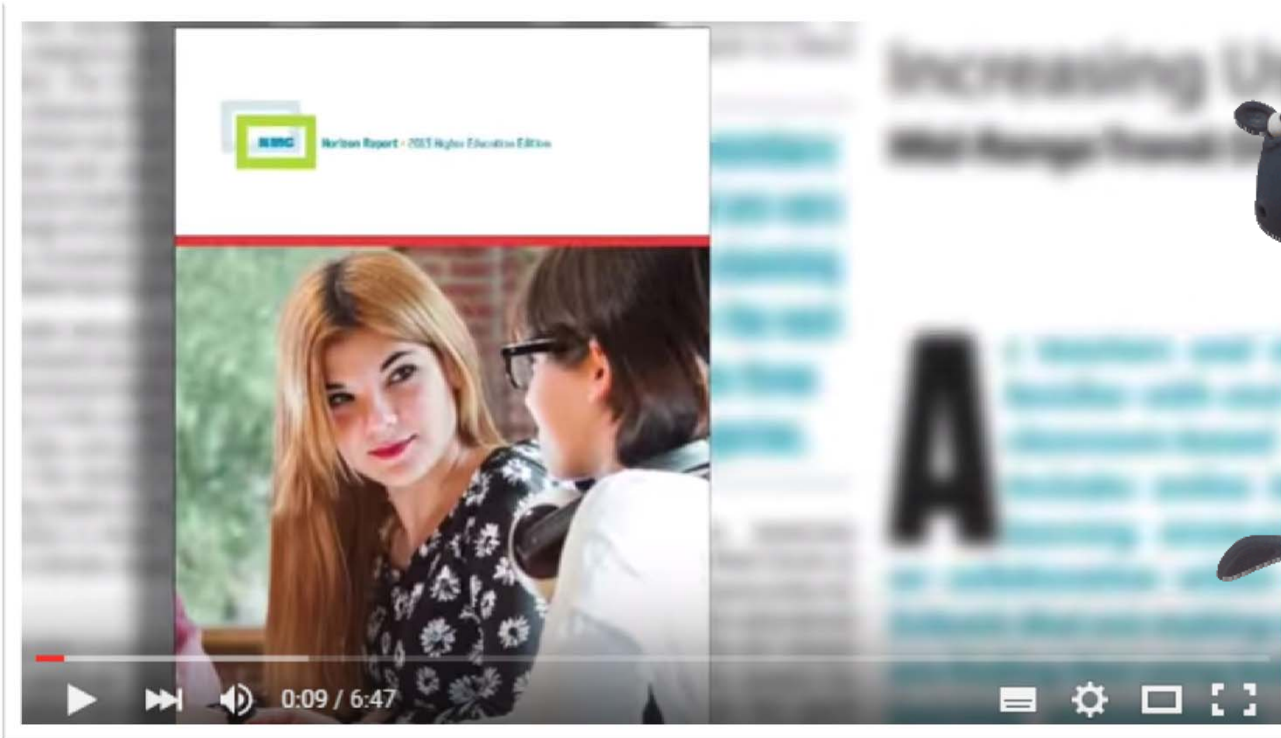
– universities are aiming to globalise and restrictions on international students entering the country means that they have to explore creative ways of tapping into this market.

- 超過 5,000 位與會者
來自高等教育行業
- 較2015年成長202%

Source : <http://www.bettshow.com/Content/Our-HE-visitors-are-aiming-ever-higher>

THE NMC HORIZON REPORT

地平線報告



The NMC Horizon Report

地平線報告：高等教育



- 美國新媒體聯盟 NMC (New Media Consortium) 探究對教學、學習等教育領域產生影響的新科技發展
- 提出關鍵趨勢與重要挑戰，以及新興科技的近程、中程和遠程影響之報告

2015 地平線報告：高等教育

6 項趨勢

6 項挑戰

CHALLENGES

SOLVABLE

- > Blending Formal and Informal Learning
- > Improving Digital Literacy

DIFFICULT

- > Personalized Learning
- > Teaching Complex Thinking

WICKED

- > Competing Models of Education
- > Rewards for Teaching



TRENDS, CHALLENGES, AND TECHNOLOGIES FOR HIGHER ED



TRENDS

SHORT-TERM

1-2 years in each direction

- > Increasing Use of Blended Learning
- > Redesigning Learning Spaces

混合式學習的使用增加
重新設計學習空間

MID-TERM

3-4 years in each direction

- > Growing Focus on Measuring Learning
- > Proliferation of Open Educational Resources

關注學習評量
開放的教育資源遽增

LONG-TERM

5+ years in each direction

- > Advancing Cultures of Change and Innovation
- > Increasing Cross-Institution Collaboration

推動變革和創新文化
更多跨機構合作

2016

2017

2018

2019

2020

NEAR-TERM

1 year or less

- > Bring Your Own Device
- > Flipped Classroom

MID-TERM

2-3 years

- > Makerspaces
- > Wearable Technology

FAR-TERM

4-5 years

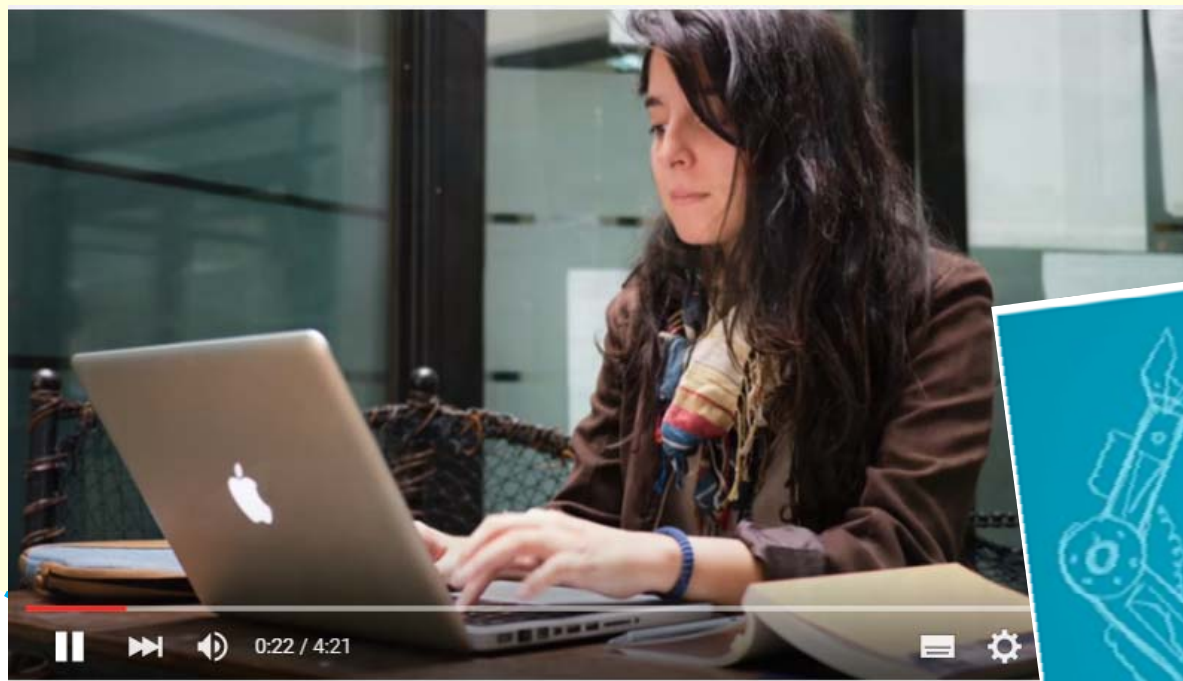
- > Adaptive Learning Technologies
- > The Internet of Things

6 項重要
教育科技

TECHNOLOGIES

2016年之調查研究和觀察結

《2016 地平線報告：高等教育》

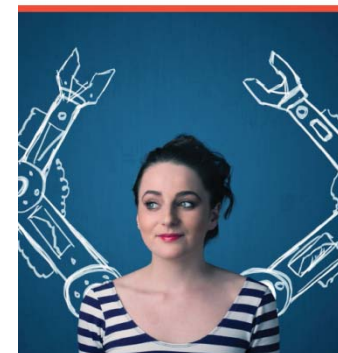


NMC Horizon Report: 2016 Higher Education Edition

 NewMediaConsortium

https://www.youtube.com/watch?v=1_55AR6evzM&nohtml5=False

《2016 地平線報告：高等教育》



CHALLENGES 重要挑戰

Solvable 可解決的
›混合正式與非正式學習
›提升數位素養

Difficult 困難的
›教育模式的競爭
›個人化學習

Wicked 嚴峻的
›平衡我們的連接和未連接生活
›保持教育相關性

TRENDS 關鍵趨勢

Short-Term Impact

- ›持續重視學習評量
- ›使用混合式學習設計增多

Mid-Term Impact

- ›重新設計學習空間
- ›轉向更深層次之學習方法

Long-Term Impact

- ›推動創新文化
- ›重新思考機構的運作

2016

2017

2018

2019

2020

以學習者為中心之教育趨勢

■ 線上、混成、協同等學習與教學方式興盛



2015 Library Edition
Horizon Report



2014 Survey of Online Learning

70.8% 線上學習為重要長程發展策略

74.1% 線上學習與面對面學習同等重要



來源: <http://www.nmc.org/publication/nmc-horizon-report-2015-library-edition/>
<http://onlinelearningconsortium.org/read/survey-reports-2014/>

Redesigning Learning Spaces

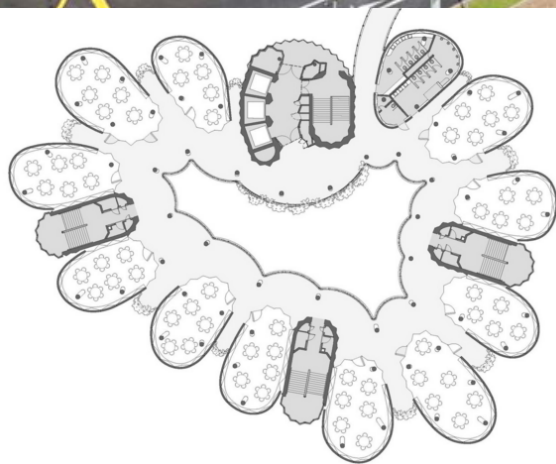
- 澳洲西雪梨大學進行課程調整
- 2016年之前大學部課程將全部改為混合式教學



新加坡南洋理工大學 Learning Hub



- 花費4千5百萬新幣打造
- 2015年8月啟用
- 56間適合新教學方法之教室



澳洲昆士蘭大學 Blended Learning Spaces



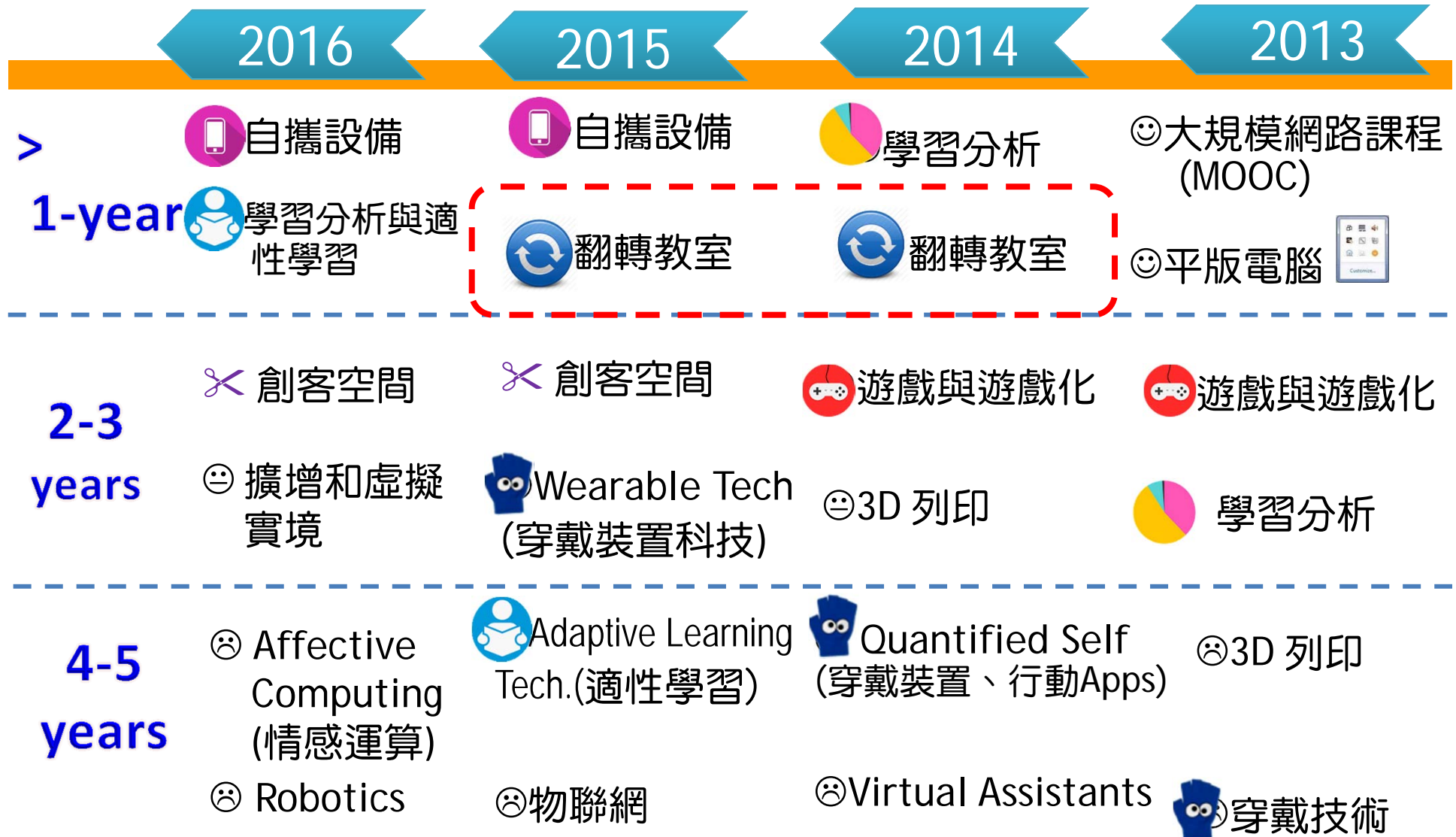
First year engineering students in the First Year Engineering Learning Centre (FYELC)



Students during a class in the Engineering Learning Centre Extension (ELCX)

近四年地平線報告之科技發展觀察

Technologies to Watch



Technologies to Watch

高等教育之重要科技發展

數位教育中心(The Center for Digital Education)
對教師之調查(2013)：

Horizon Report
2015 Higher Ed



29%

已採用翻轉教學

27%

打算於1年內採
用翻轉教學

75%

準備翻轉教學所花費的
時間要比傳統教學多

83%

對教學的態度產生
正面的影響

86%

採用翻轉教學後，
學生的態度有所改進

您 翻轉 了嗎？



與翻轉教室的初次邂逅



翻轉教室 (Flipped Classroom)



KHANACADEMY

參考資料: 中華資訊素養學會, 以學生為中心的「翻轉教室」, <http://www.cila.org.tw/?p=2749>

Flipped Classroom 翻轉教學

核心精神

- 學習的責任回歸到學生身上
- 老師角色為學習的引領及協助



教學理念

- 培養主動探索問題、深入思考之精神

教學設計

- 訂定明確學習目標
- 需充份應用互動、溝通

圖片：<http://blog.openstudy.com/wp-content/uploads/2010/04/600-01112315n.jpg>

參考資料：田美雲，「翻轉教室」(Flipped Classroom) 介紹，http://ctld.ntu.edu.tw/_epaper/news_detail.php?nid=452

翻轉教室 (Flipped Classroom)

- 2012 年「均一教育平台」的引進
<http://www.junyiacademy.org/>



均一教育平台



我是學生



我是教練

新手上路？歡迎瀏覽我們的精選內容



105年學測解題

最新105年學測精闢
解題影片。快來看高



互動式練習題

均一互動式練習題讓
你的學習更有樂趣！



新功能介紹

還不知道「指派任
務」是什麼嗎？想知



國中生物

大自然存在著蘊藏許
多奧秘，快來一同探



晉級的均一

均一與宜蘭瘋學習合
作，快透過教練報名

來自翻轉教室的啟發

- 葉丙成教授提出 **BTS** 新教學思維
- 2014 年起於全臺各地辦理多場中小學老師的大型翻轉教室工作坊
- 應用：臉書開社團、使用 Google Form、學生分組（讓同儕之間既合作又競爭）

By The Student



<http://www.fliptw.org/>

Flipped Classroom 翻轉教學之核心

翻轉教室教學



SOPHIA Tutorial as Homework

學生在家能**自主、有系統**的觀看講授內容

在課堂能**有效評量學習成果**
(老師和學生一起做練習、解決
問題和討論)



圖片來源：<http://www.avatargeneration.com/wp-content/uploads/2012/08/sophia.png>

參考資料：田美雲，「翻轉教室」(Flipped Classroom) 介紹，http://ctld.ntu.edu.tw/_epaper/news_detail.php?nid=452

臺大 PaGamO 勇奪全球教學創新首獎！

- 在第一屆教學創新大獎「Reimagine Education」，勇奪 E-Learning 類別首獎 + 終極最大獎「Wharton/QS Reimagine Education」



從學生喜好
發想教學創意

葉丙成老師
的理念

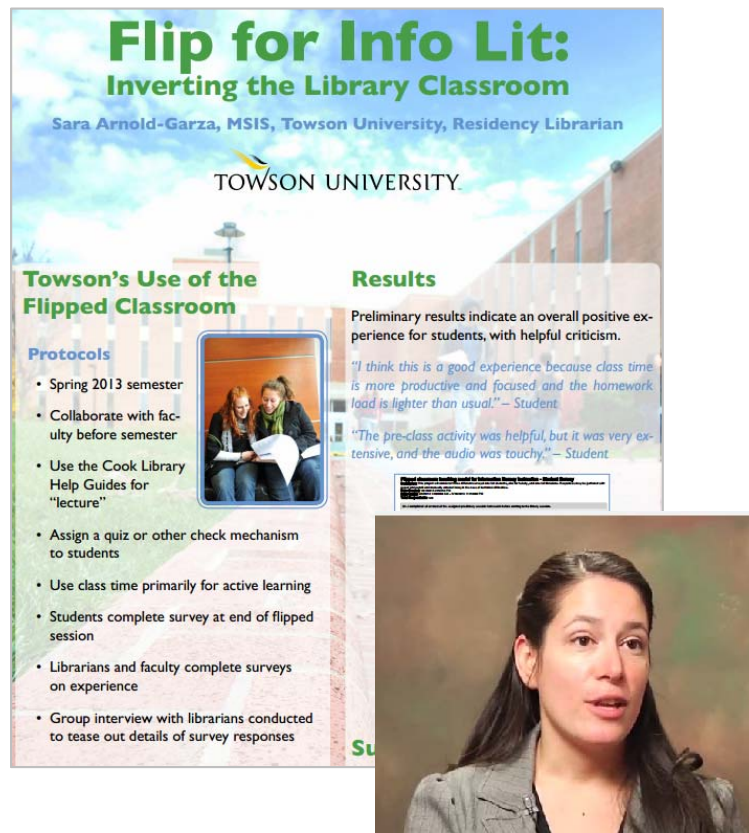
點燃學生
學習動機

讓學習走出教室
跨越時空

還給學生
學習主動權

翻轉教學在大學圖書館的應用

- Towson Univ. 館員於2013年參與翻轉教室教學計劃，獲教學創新獎



更多案例：

- Purdue University
- Long Island University
- Marquette University
- Oakland University
-

圖書館利用指導·資訊素養課程

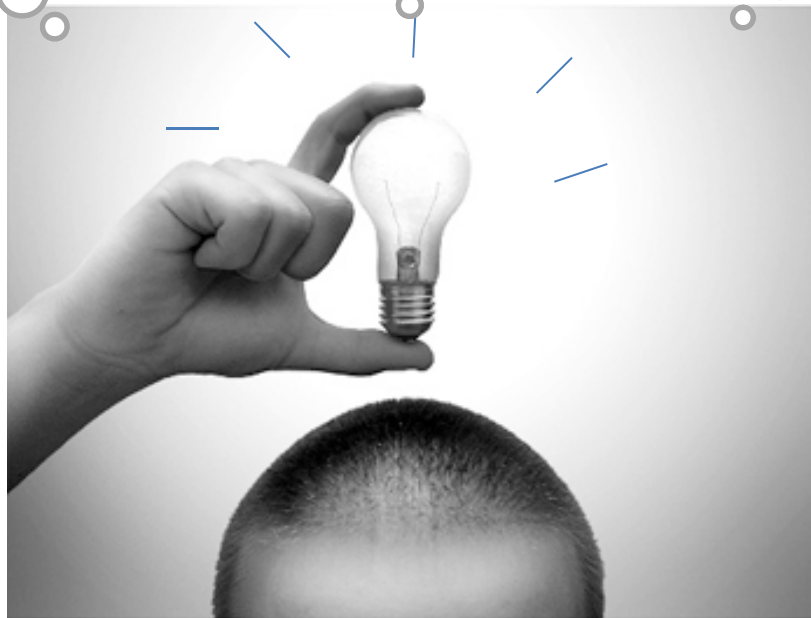
Source: 1. Sara Arnold-Garza, "The flipped classroom: assessing an innovative teaching model for effective and engaging library instruction", *College & Research Libraries News*, Jan. 2014, pp. 10-13.
2. <https://sites.google.com/site/innovationcapstone/>

翻轉教室對館員的挑戰

圖書館利用指導
與資料庫講習?

圖書館空間改造
以符合讀者需求?

協助教師製作
課程影片?



實務篇—台大圖書館的經驗

Let's Start!



To 翻 or Not to 翻...

- 2015 年初，學科館員組成翻轉小組，集思廣益對於翻轉教室的可行性...

沒有
強制力

阻力

備課
很麻煩

沒人
會預習

已經會了，
為何要來？



To 翻 or Not to 翻...



助力

遊戲 + 分組競賽



想玩，故先預習！

討論 + 解題



更入了解

讀者怎麼想?

問卷調查結果



願意課前預習?

一定會

可能會

10%

72%

85%

認為**單純講解**課程容易忘記所學

60.4%

搭配**小組討論**有助於學習

無意見 29.3%

96.6%

認為**搭配現場練習**有助於學習

34.5%

搭配**遊戲活動**有助於學習?

無意見 46.6%

願意參加**翻轉教室**?

60%

願意

26%

不願意

臺大圖書館的新嘗試

- 2015年推出 3 種課程
 - EndNote 基礎班 / 進階班
 - Web of Science + JCR



核心理念

遊戲+分組競賽

討論+解題=
更深入的了解



從遊戲競賽中翻轉 EndNote 學習

課程操作方式

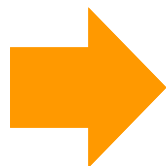
- 由淺入深，讓每一位參加者都上台解題
- 透過團隊分組競賽，促進合作學習
- 從同儕學習中，分享不同的解決方法
- 拉近館員與讀者間的距離



實施流程

Step 1.

觀看線上課程



Step 2.

線上自我評量



Step 3. 參與實體課程

分組



抽題



小組討論



上台解題



遊戲競賽

- ❖ 大富翁
- ❖ 賓果
- ❖ 翻滾猴

Step 1. 觀看線上課程



Endnote課程

基礎班 24 短片，44 分鐘
進階班 10 短片，32 分鐘



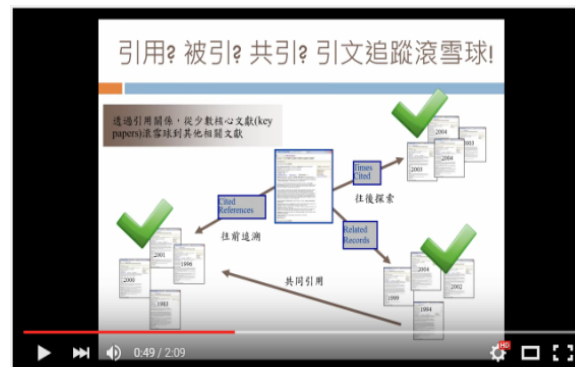
WoS課程

9 短片
28 分鐘



JCR課程

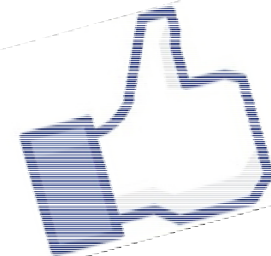
4 短片
22 分鐘



每段課程約

2~3 分鐘

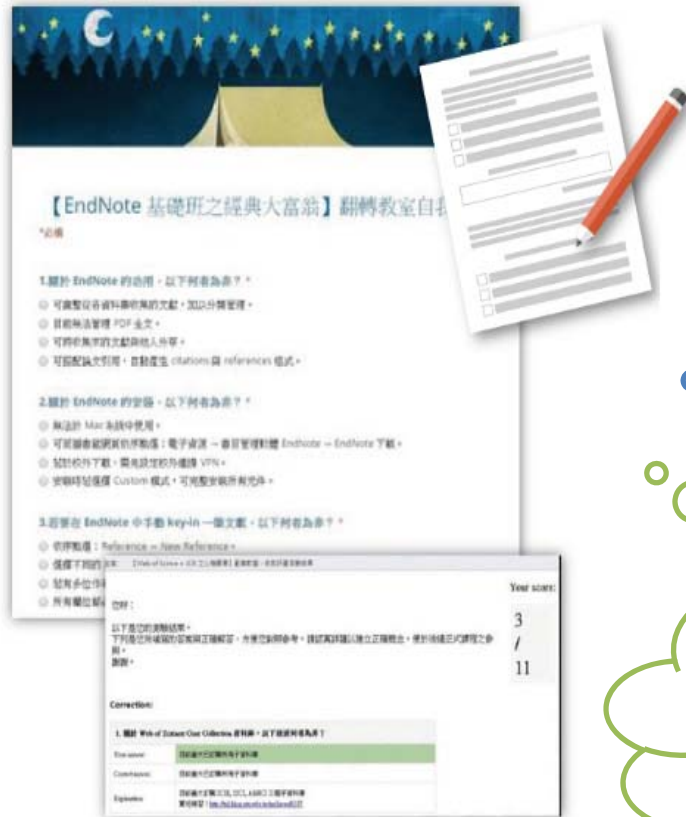
維持最佳專心度!



Step 2. 線上自我評量

自動寄送得分與詳解

以自行評估理解程度！



Google 表單



MCQ tests 外掛



操作步驟：

<https://goo.gl/mo31n8>

Step 3. 實體課程：

解題+遊戲



翻轉教室課程實況



採團隊合作進行課程，
學生積極參與，氣氛熱絡愉快！

有別於一般
圖書館利用講習，



翻轉教室課程實況

安排小老師於
討論中穿針引線



同儕間的討論與互助，
分享不同的解決方法！



學習動機
明顯高昂

自主學習，深化思考



由讀者作為
解決問題
與上台解說的
主角



打破傳統
「我講你聽」
的填鴨式教育

講者從旁
支援與補充



將學習的責任
還給學生

遊戲競賽，活化教學



以“ 遊戲+分
組競賽” 包裝

誘使讀者為了
“想要玩遊戲”

設計遊戲激發館
員創意，增加課
程趣味性

成功提升學習
動機，使
上課 **≠** 無聊



而觀看線上影片
自學，並來參加
實體課程

課後開心合照



除獎品、名次外，
讀者在課前的參與



使自己獲得足夠
的先備知識



再到實體課程透過討論練習，獲得深入的學習，
才是參與翻轉教室的最大收穫☺

翻轉教室 課後問卷回饋

100 % 同意

參與實體課程有
助於更加理解線
上課程內容

98 % ↑

喜歡課程活動
&
認為有助提升
學習動機

85 % ↑

認為較傳統利
用講習有助於
學習

願意再次參加

98% ↑

整體滿意度

96% ↑



翻轉教室 學生的回饋

- 太有創意了，非常好玩，而且做中學真的比傳統講授法可以深入了解
- 真的太有趣了!! 而且我也好久沒去圖書館，進去才發現有好多活動! 以後會想常去圖書館逛逛，有此類活動也會主動報名!



對讀者

- 自主學習
- 提升動機
- 練習與討論
- 同儕交流
- 知識與能力成長

效益



對館員

- 節省重複講授
- 挑戰自我
- 把工作變好玩
- 增進與讀者交流
- 促進團隊合作

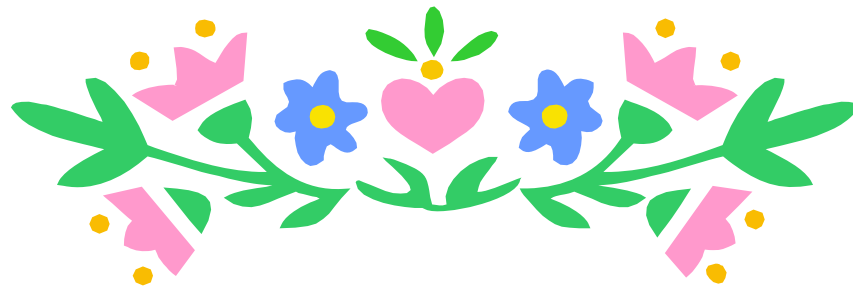
對圖書館而言

- 掌握脈動，創新服務
- 深度參與讀者的學習歷程
- 激發館員潛能
- 創造機會，建立好形象

Imagine the Future



理念改變，行動跟著改變，創新就靠你和我！



謝謝聆聽！

敬請指教！

