

雲端時代下，以數位圖書館 為基礎之數位學習

Supporting e-Learning Through
Digital Libraries in the Cloud Era



5/24/2017

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報告內容

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- 優質數位圖書館學習資源
- 科技改變「教」與「學」方式與環境
 - ▣ 學習者、授課者與圖書館（館員）之關聯分析
- 雲端環境下的學習與應用
 - ▣ 雲端計算下的科學應用
- 智慧型圖書館資訊服務(學習雲)
 - ▣ 以學習者為本的個人化增值服務
- 結論與討論

優質數位圖書館_1

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The screenshot shows the homepage of the International Children's Digital Library (ICDL). The header features the ICDL logo and the text "INTERNATIONAL CHILDREN'S DIGITAL LIBRARY" and "A Library for the World's Children". Below the header is a navigation menu with links for "Read Books", "About Library", "People", "How to Contribute", "In the News", "Help", and "Sign In". A language selector bar is visible with options for "English", "Español", "Français", "Монгол", and "Русский". The main content area is divided into several sections: "THE LIBRARY" with links for "First-time Visitors", "Library Members", and "Book News"; "POPULAR SEARCHES" with options for "Books by Country", "Recently Added", "Award Winning", and "Advanced Search"; "FROM OUR SHELVES" featuring book covers in German, Persian/Farsi, Hungarian, and Hebrew; "FEATURED BOOKS" with titles like "Celtic Tales", "Legends of the Maori", and "The Hare of Inaba"; "SUPPORT THE LIBRARY" with buttons for "MAKE A DONATION" and "VISIT OUR GIFT SHOP"; and "LIBRARY NEWS AND NOTES" with a recent update about search tools in Korean.

<http://en.childrenslibrary.org/index.shtml>

- ICDL：1995-至今
 - 全球免費繪本電子書
- 目標：超過10,000本，至少100種語言
- 目前已經達到73種語言
- 全球化與多元文化衝擊
 - 認識多國語言書籍
 - 看圖說故事
- 打開小朋友的視野
 - 多國語言，認識全世界

優質數位圖書館_1

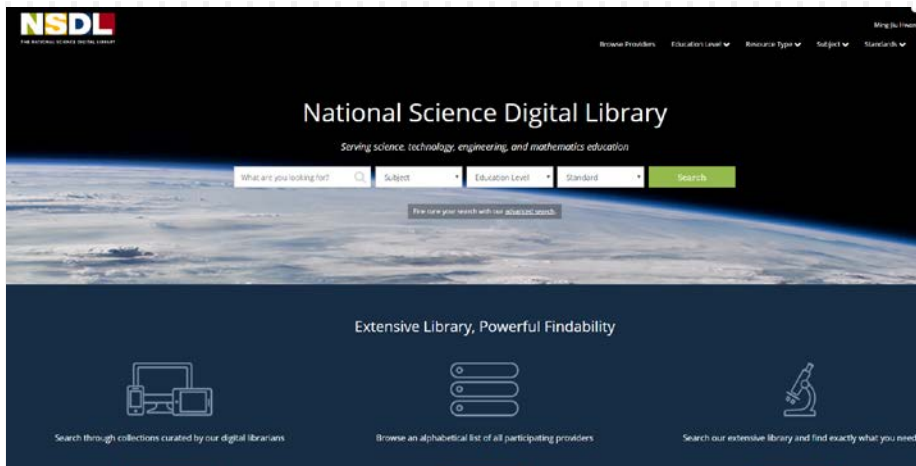
□ 不用鍵盤即可查詢的檢
索介面

□ 各國不同風格、文化、
畫風的繪本書

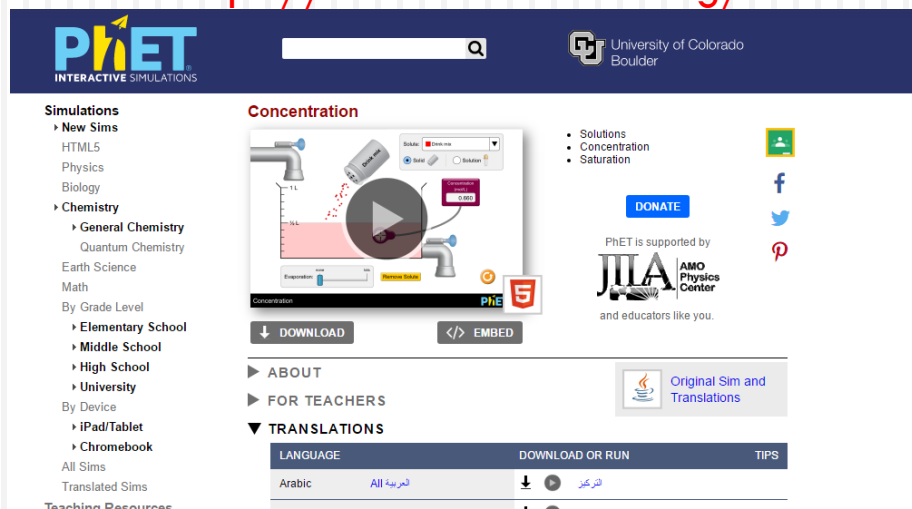


優質數位圖書館_2

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<https://nsdl.oercommons.org/>

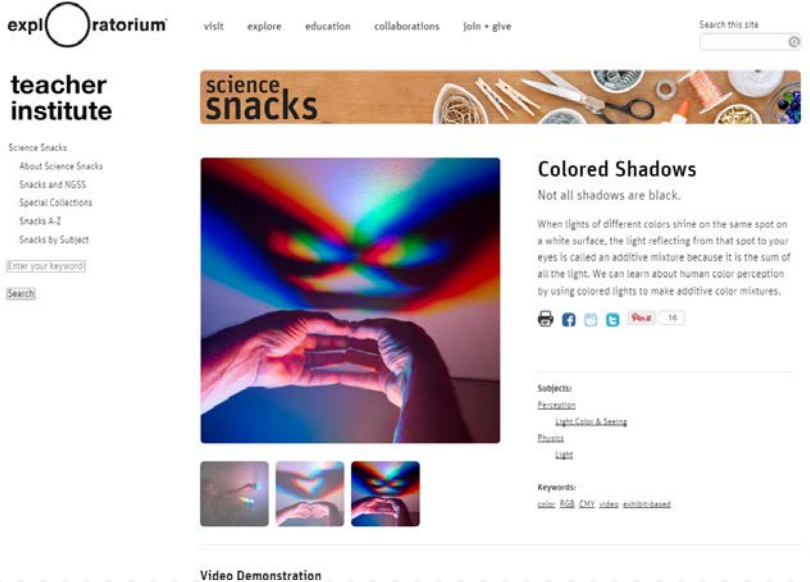
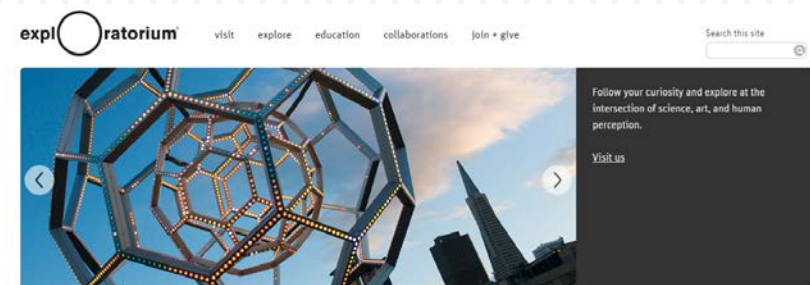


<http://nsdl.oercommons.org/courses/phet-teacher-activities-hooke-s-law/view>

- NSDL:1994-至今
- 前身為**STEM** Digital Library
- 四種領域的教學與理論內容**數位化、互動化、3D化**
- 讓艱深的科學內容更有趣，更容易理解
- 實驗虛擬化
 - 可以不斷的練習與體會

優質數位圖書館_3

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- Exploratorium:2000-至今
 - 透過科學，藝術和人類知覺來探索世界的公共學習實驗場域
- 使命：創造以「探索」為基礎的經驗，改變學習的方式
- 設計出許多工具，讓學員實際體驗，實作
 - 反思、探索、解決問題
 - 12國教精神

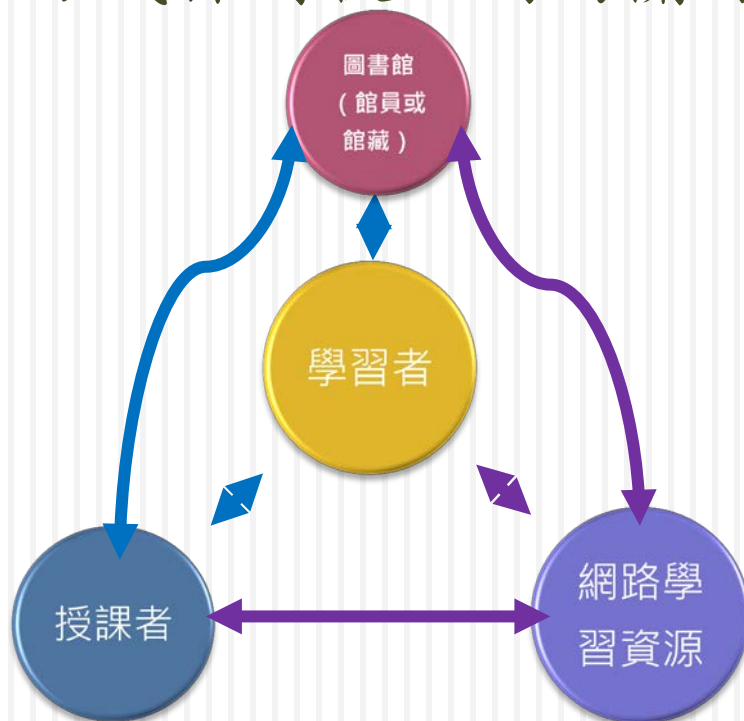
優質數位圖書館學習資源

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- **環境**：處身於**資訊爆炸**的時代
 - 每天接觸或產生到多少(錯誤、垃圾)資訊？
 - 值得**保存與學習**的資訊所占比例為何？
- **行為**：快速地瀏覽、閱讀、回覆
 - 只會按讚（**跟隨**）、零碎與片段資訊、同時處理多種來源訊息（多工）...
 - 無法專心、專注度不足、容易分心...
 - **判斷資訊正確性**的能力越來越差
 - 時間的壓迫？
- 學習者（尤其未成年）更需**被引導**閱讀優質網站內容

授課者、學習者與圖書館關係

- 系統化方式探討彼此間的關係與現象



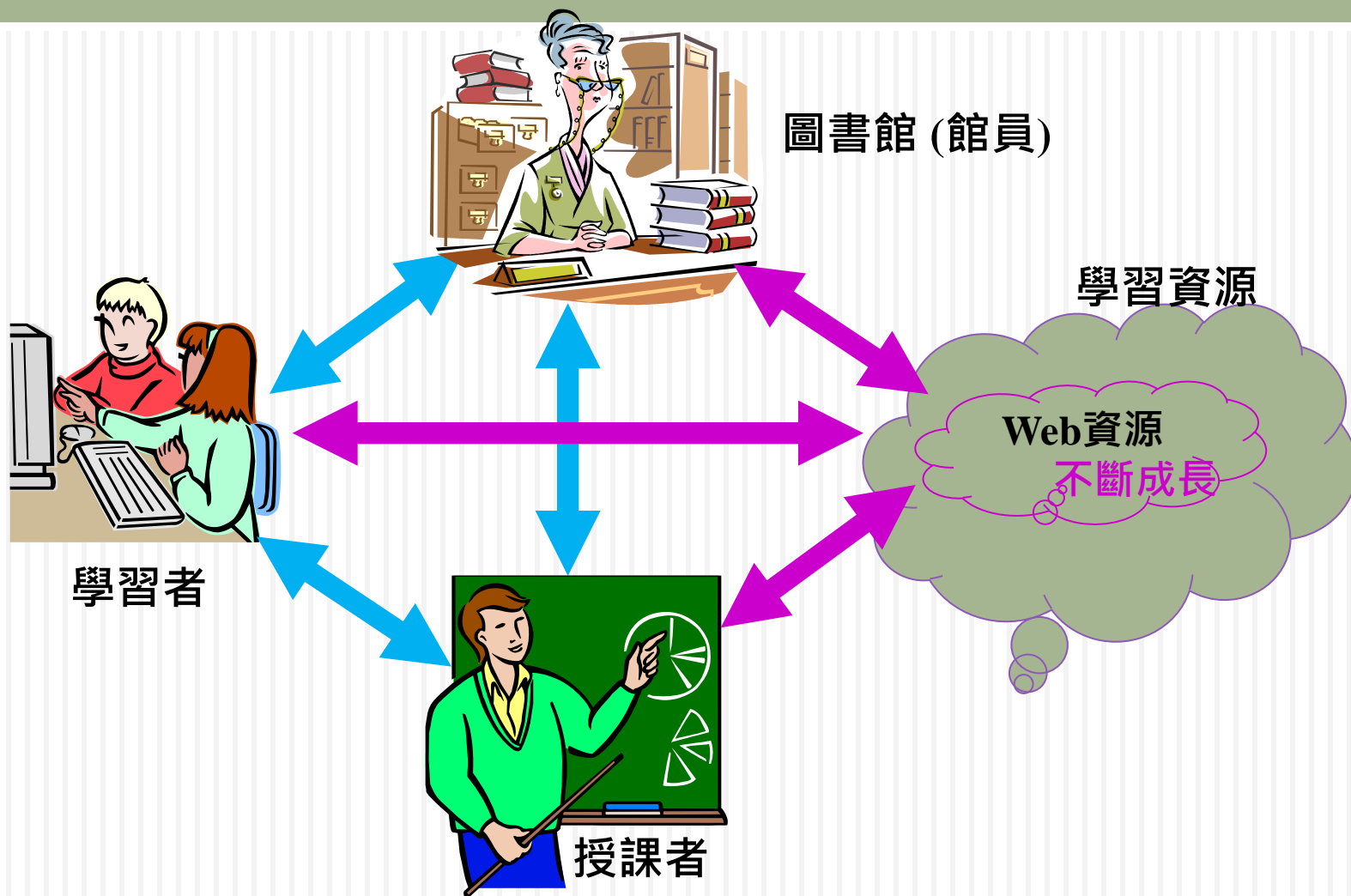
科技改變「教」與「學」方式與環境

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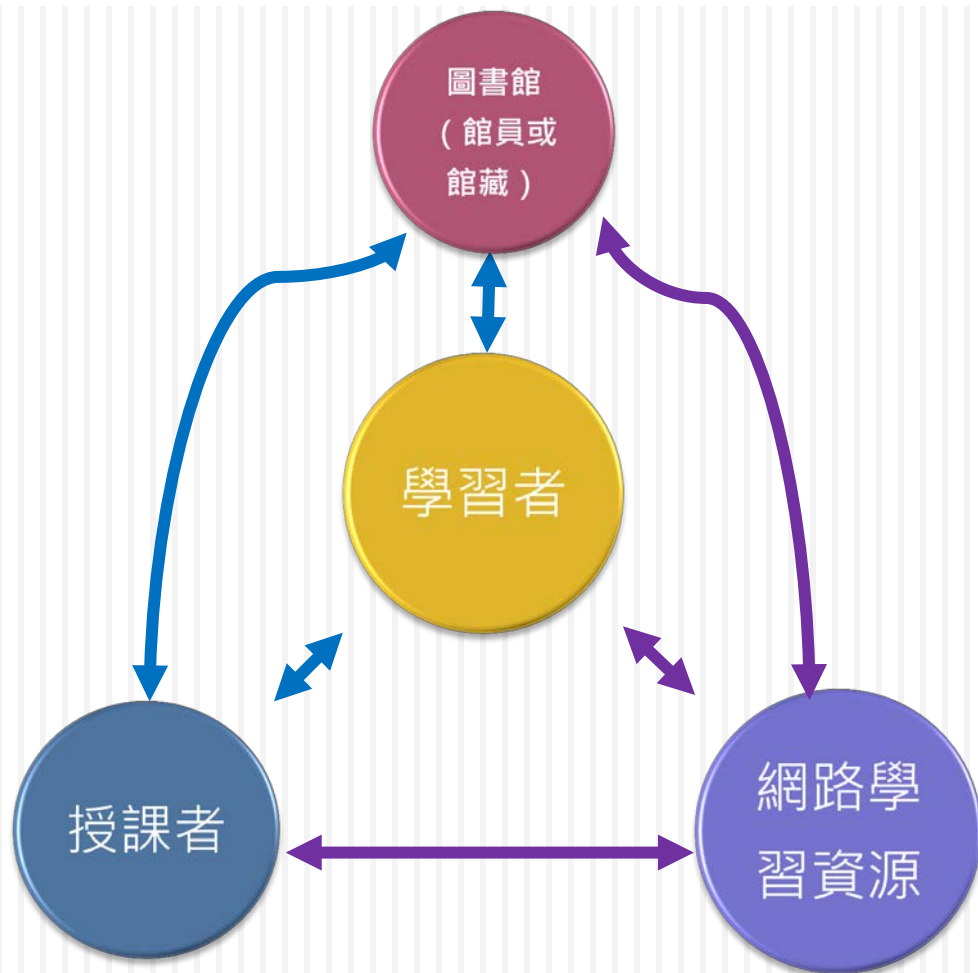
- ICT電腦通訊網路與傳播科技的進步
 - ▣ 創造出新型態的資訊、知識傳播與分享方式
 - ▣ 數位化學習資源
- 改變了教學空間的本質
 - ▣ 不受限於教室
- 『學習方式』、『學習途徑』與『學習型態』均產生了快速的變化
 - ▣ 學習場所由教室變成網路
 - ▣ 學習者由被動化為主動
- 快速翻轉整個「教」、「學」環境

數位圖書館與學習環境

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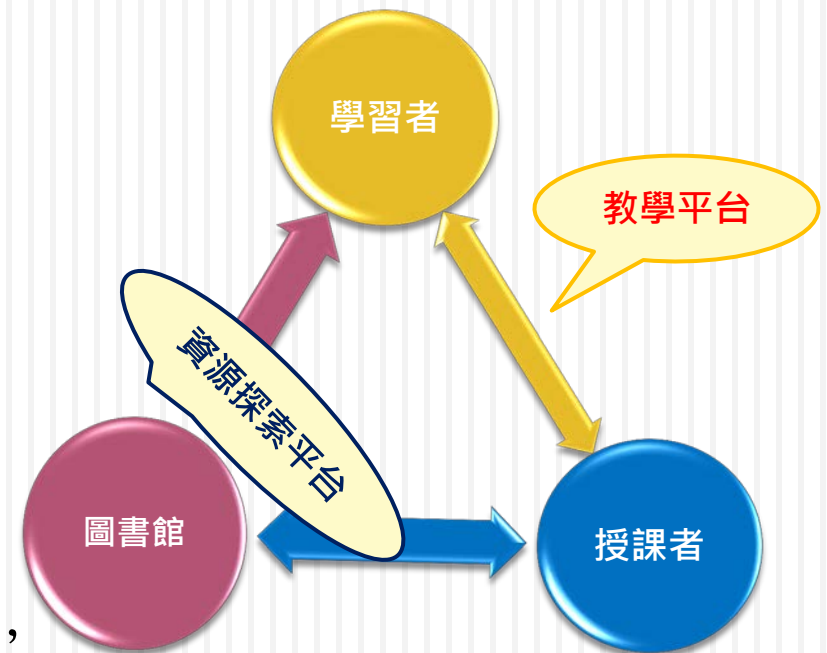
以學習者為本的學習環境



- 數位化的學習內容與資源快速成長
- 學習的工具與環境快速改變
 - ▣ 行動化的載具與雲端化的資訊環境
- 學習者自學能力
- 教學者因材施教
- 數位圖書館資源與智慧型資訊服務

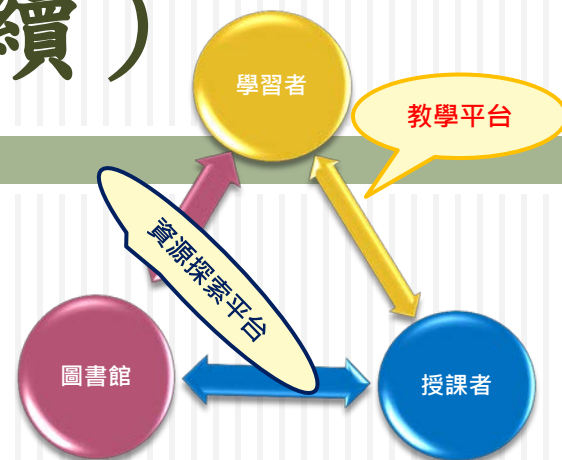
授課、學習者與圖書館

- 過去（紙本環境）
 - 教室為主要的教學場域
 - 手寫、紙本教科書
 - 圖書館為書庫與K書中心
- 目前（紙本＋數位環境）
 - 教室＋線上教學平台
 - 教：數位教學教材、紙本教科書、手寫黑板為輔
 - 學：聽講、手寫筆記，互動多元
 - 以**教學平台**為教學的輔助溝通平台，保存教學教案與學習履歷資料
 - **翻轉教學**



授課、學習者與圖書館（續）

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- 目前（紙本＋數位環境）
 - ▣ 混合式（Hybrid）圖書館
 - 多元豐富的電子資源
 - 資源探索平台，提供讀者整合查詢數位資源
 - 直接下載或線上閱讀
 - 優質閱讀學習空間，Learning Commons
- 未來無紙化環境
 - ▣ 全面數位教材，線上教學平台為主，網路授課為主流
 - 教室已經不是教學的場域
 - 學生可望來教室上課，相見歡
 - ▣ Bookless Library

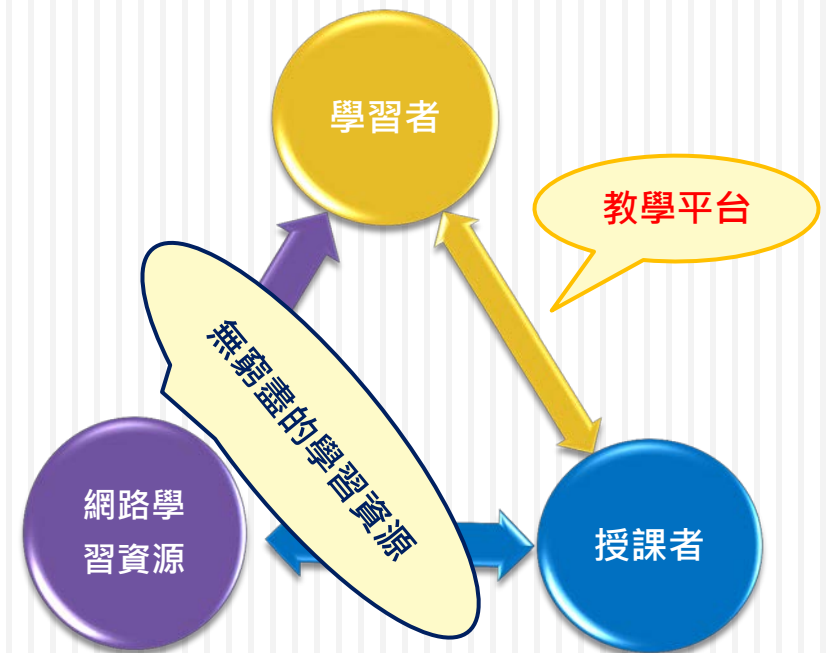
授課、學習者與網路學習資源

□ 目前

□ 網路資源逐漸「取代」圖書館角色？

- 教：數位教學教材多來自網路資源、**動畫**內容生動有趣、**容易理解**深奧的理論...
- 學：碎片式的資訊與知識、無法判斷資料正確性、作業答案上網找、資料太多...

□ 授課者需要扮演**引導**的角色，**慎選優質網站資源**供學習者閱讀與學習



授課、學習者與網路學習資源 (續)

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開放課程 (將上課內容錄製保存)

The screenshot shows the MIT OpenCourseWare website. The header includes the MIT logo and navigation links like 'Find Courses', 'About', 'Give Now', and 'Featured Sites'. A search bar is also present. The main content area features a 'History' course page with a historical map and a 'Give Now' button. Below this, there's a section for 'OCW NCTU Open CourseWare' with a navigation menu and a video player showing a presentation about the program.

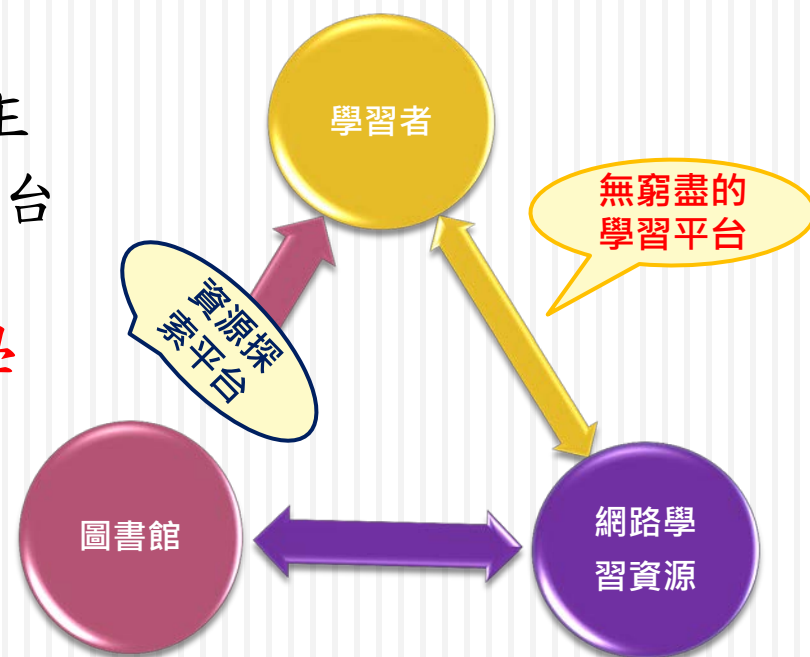
(台灣) MOOCs

The screenshot shows the MOOCs Taiwan website. The header features the 'MOOCs' logo and navigation links. The main banner area has the text '開放課程 X 自主學習' and '共同打造華人數位學習新典範'. Below the banner, there's a search bar and a grid of course listings, including '目前搜尋條件 (48項)', '關鍵字', '狀態', and several course cards with details like 'YENIA' and '統計學'.

網路上課，取得學分

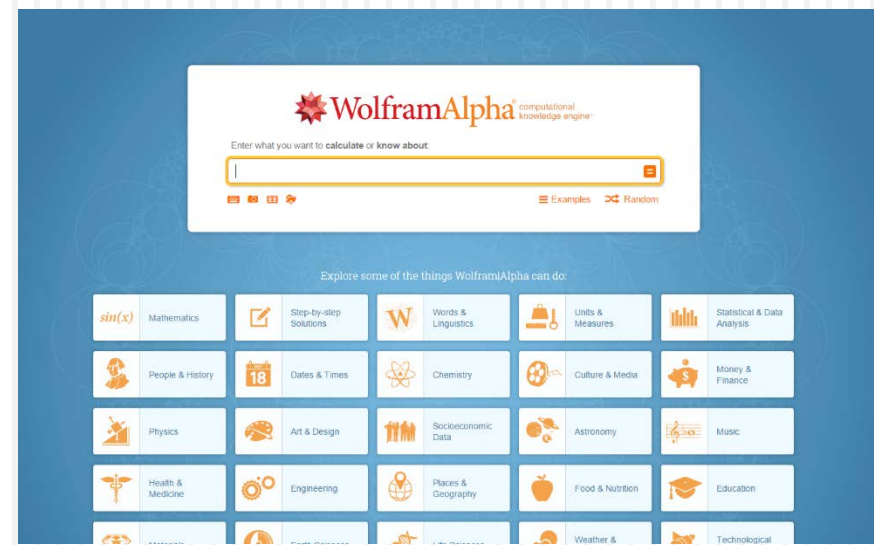
學習者、圖書館與網路學習資源

- 學習者以**網路學習資源**為主？
 - 除了課堂的學習基礎外，幾乎來自網路的資料作為學習的資料
 - 進圖書館以借實體書與K書為主
 - 透過圖書館所建置的資源探索平台取得數位學習資源
- 圖書館藉由社群媒體，**引導學習者取得圖書館資源**
 - Google scholar + SFX
 - FB+SFX
- 圖書館員蒐集許多優質學習或Open Access期刊...



雲端化之學習環境

- 雲端化之五大特徵與特性
- 雲端化之學習環境
- 教學、學習資源與個人學習雲

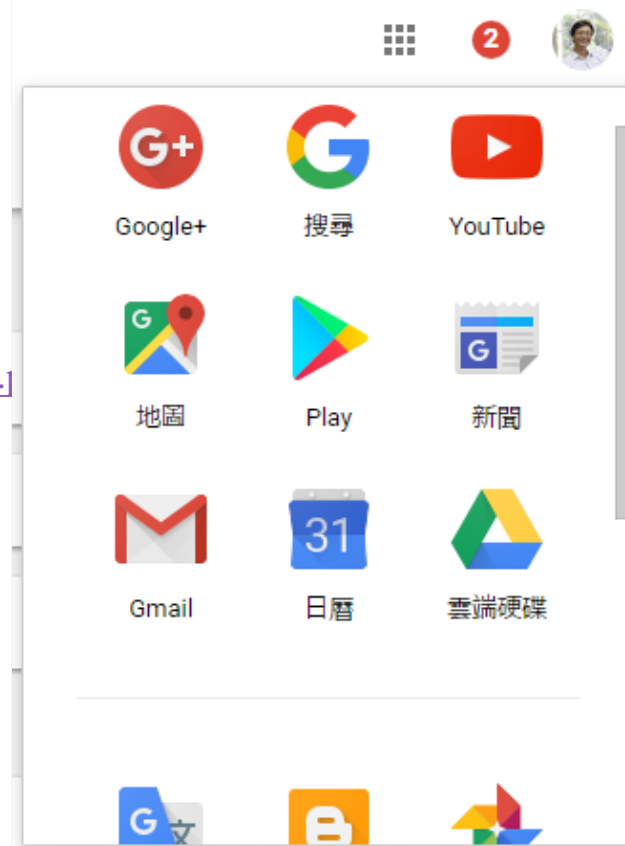


<https://www.wolframalpha.com/>

雲端化（計算）五大特徵

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- The NIST Definition of Cloud Computing
 - On-demand self-service 自我隨需服務
 - Broad network access 廣大網域存取
 - Resource pooling 資源共享池
 - Rapid elasticity 快速彈性佈署
 - Measured service 可計量的服務
(<http://nvlpubs.nist.gov/nistpubs/Legacy/SP/nistspecialpublication800-145.pdf>)
- Google的雲端服務
 - 運用App Engine資訊平台進行快速佈署
- 易於個人化服務與資源共享



雲端化之數位圖書館與學習環境

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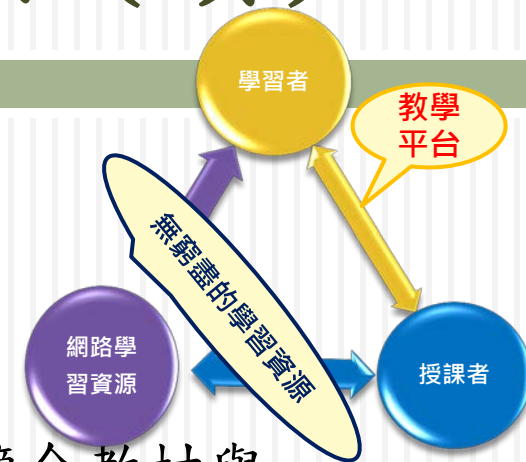
教學、學習資源與個人學習雲

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- 教學相關系統整合
 - 數位圖書館系統、教學平台與所有學習相關系統都整合於雲端系統（教育雲？）中
 - 各系統間資源與資料共同分享，無縫串接
- 大數據分析與個人化服務
 - 數位圖書館與學習資源大數據分析
 - 智慧型資料組織與主題分析
 - 個人偏好屬性分析
 - 智慧型個人化服務
- 個人化知識管理平台
 - 終身學習履歷紀錄

教學、學習資源與個人學習雲（續）

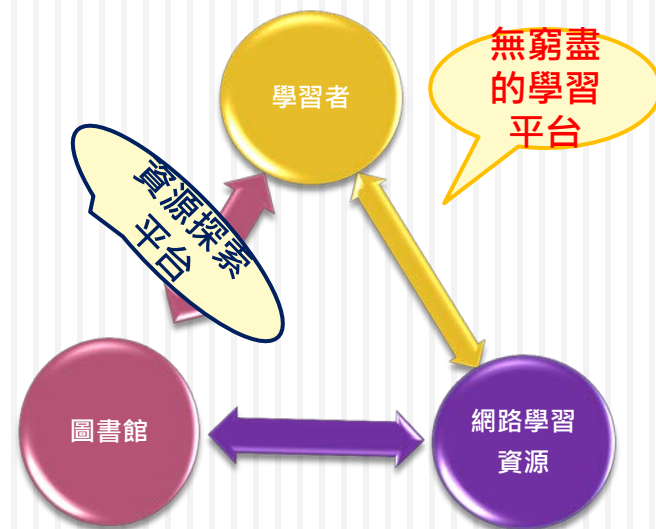
- 雲端化之智慧型態網路學習環境
 - 學習資源大數據 + 分析適合個人學習資源
 - 大數據分析技術精進
 - 教：因材施教的優質環境，可分析出授課者適合教材與每位學習者適合的教學方式
 - 主動提供教學者優質的教材（如Google Scholar的分析）
 - RSS訂閱優質教案後，後續主動提供
 - 學：自學更有效率，可依據學習歷程分析出所需的資源
 - 主動提供學習所需的資源與作業答案
 - 學習歷程的
 - 授課者與學習者共同編輯（創作）網路教學資源



雲端化輔助學習的數位圖書館

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- 以學習者為中心的平台
 - 學習課程相關資源
 - 根據學習者的程度
 - 學習者興趣的相關資源
 - ...
- 典藏與再利用
 - 保存學習者所有學習資源
 - 複習與更新
- 與學習者互動
 - 提供新知
 - 學習者作品、心得及經驗回流
- 協助數位學習社群之經營
- 協助學習者解答問題，培養資訊素養能力
 - 提供資訊素養教育網路課程並與學科領域結合

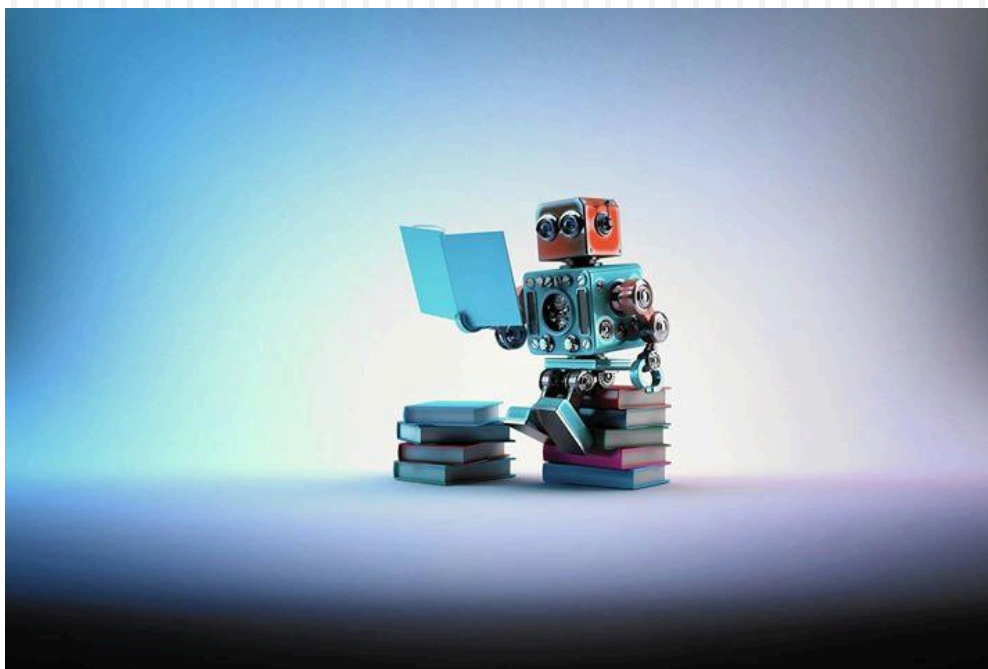


結論與未來展望

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- ICT快速的發展與進步，優質的學習資源或數位圖書館的建置更加重要
- 以學習者為中心的學習環境
 - ▣ 學習者：判斷資料正確性與自學能力更加重要
 - ▣ 教學者：因材施教的核心理念更加重要；引導或組織整體與提供適合學習者閱讀與學習的數位資源
 - ▣ 圖書館：積極投入配合課程的需求，以學習者為中心而不是以蒐集為重新，再度成為學習中心
- 雲端時代來臨，建置學習者的個人知識管理平台
 - ▣ 終身學習履歷與個人知識管理中心
 - ▣ 分享、再利用、再組織、再創造知識與保存知識

敬請指教



資料來源：<http://outdonews.com/news/480127/opinion-hero-librarians-create-fake-reader-save-books-outsmart-algorithms>
(1/21/2017)

SUPPORTING E-LEARNING THROUGH DIGITAL LIBRARIES IN THE CLOUD ERA



May,24,2017

Ming-Jiu Hwang Associate Professor & Associate Director of National
Chiao Tung University Library

Outline

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- High-Quality Digital Library Learning Resources
- Technology Changes the Means & Environments of *Teaching & Learning*
 - Correlative Analysis of the Learners, Teachers & Librarians
- Learning & Application in Cloud Environment
 - Scientific Application under Cloud Computing
- Intelligent Library Information Service (**Learning Cloud**)
 - Personalized Value Added Service for Learner
- Conclusion & Discussion

High-Quality Digital Library (I)

3

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<http://en.childrenslibrary.org/index.shtml>

- ICDL : Since 1995
 - ▣ Global **free picture e-books**
- Goal: 10,000+ Titles in more than 100 Languages
- Now offers **73** Languages
- **Globalization & Multi-Cultural Shock**
 - ▣ Multi-linguistic e-books
 - ▣ Story Telling by Pictures
- Expand Children's **View**
 - ▣ Multi-languages & Whole World

High-Quality Digital Library (I)

4

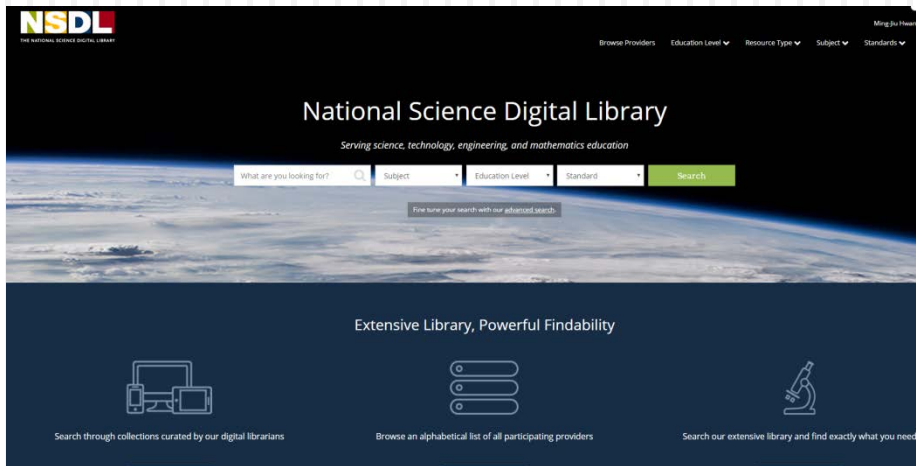
□ Dashboard allows Searching without Keyboard

□ Picture e-books with different countries, cultures and styles

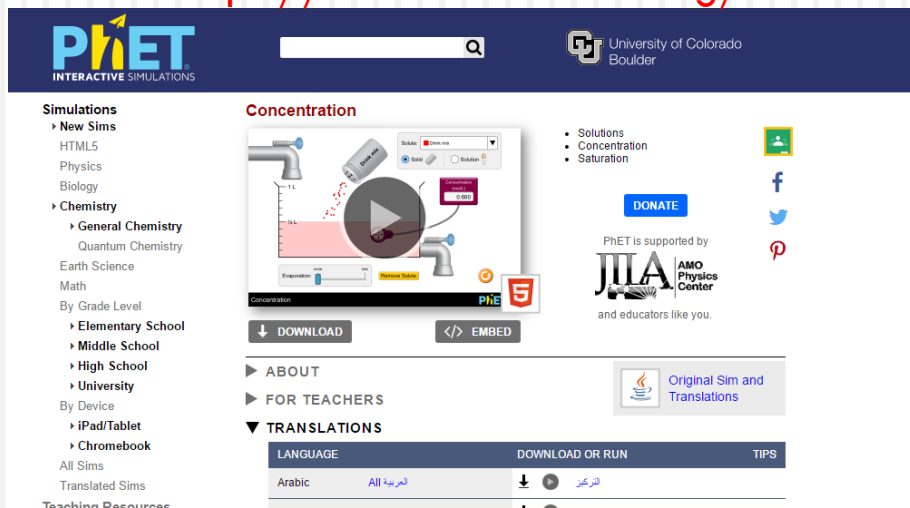


High-Quality Digital Library (II)

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<https://nsdl.oercommons.org/>

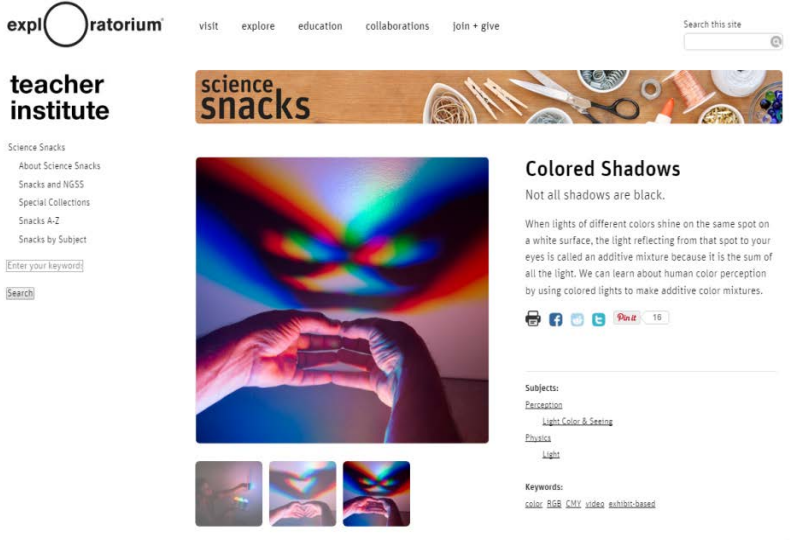
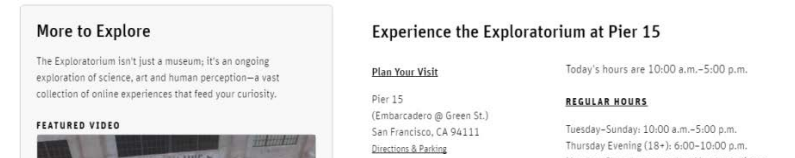
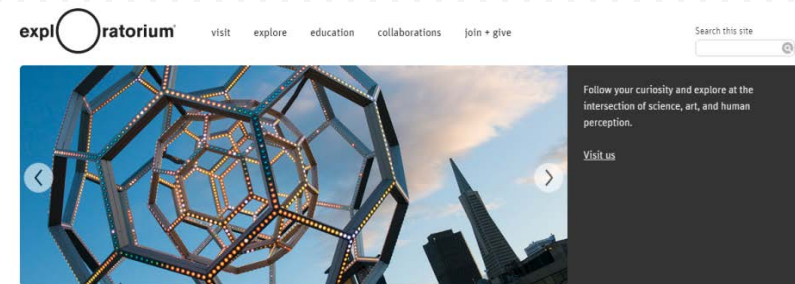


<http://nsdl.oercommons.org/courses/phet-teacher-activities-hooke-s-law/view>

- NSDL: Since 1994
- former **STEM** Digital Library
- **Digitalization & Interaction & 3D** of Teaching & Theory Content in 4 domains
- Make Difficult Scientific Content more Funny & Comprehended
- Virtual Experiments
 - Continued Practicing & Understanding

High-Quality Digital Library (III)

6



Video Demonstration

- Exploratorium:
 - from 2000 until now
 - Explore the Public Learning Experimental Fields in the world through **Science, Art** and **Human Sense**.
- Mission: Create “Exploration” based Experiences to Change the Ways of Learning
- Design many Tools to allow students to Experience and Practice Actually
 - **Reflection & Exploration & Solution**
 - **Spirit of 12-Year Compulsory Education**

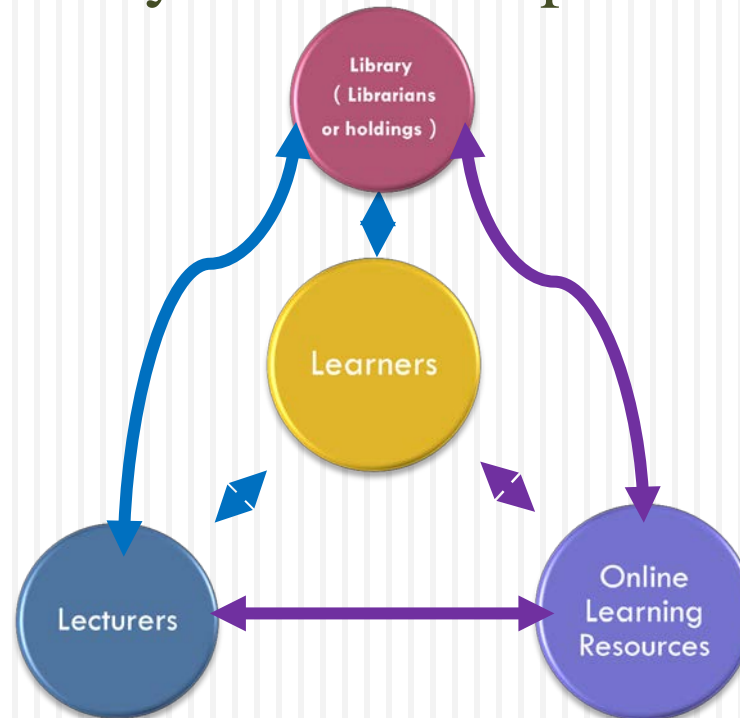
High-Quality Digital Library Learning Resources

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- **Environment: Information Explosion** Era
 - ▣ How much wrong or waste information each day?
 - ▣ What the proportion of the information that is valuable to be **saved and learned** is?
- **Behavior: Quickly Browse & Read & Reply**
 - ▣ Click *Like* Button(**Follow**), Fragmental Information, Simultaneously Process Information from Many Sources(Multi-Process)...
 - ▣ Distract & Divert...
 - ▣ Reducing Capability to **Determine the Exactitude of Information**
 - Pressure of Time?
- Learners, especially Nonages, are needed to **be guided** to access high-quality website content

Interrelationship among Lecturer & Learner & Library

- Discuss Systematically Relationship & Phenomena among Them



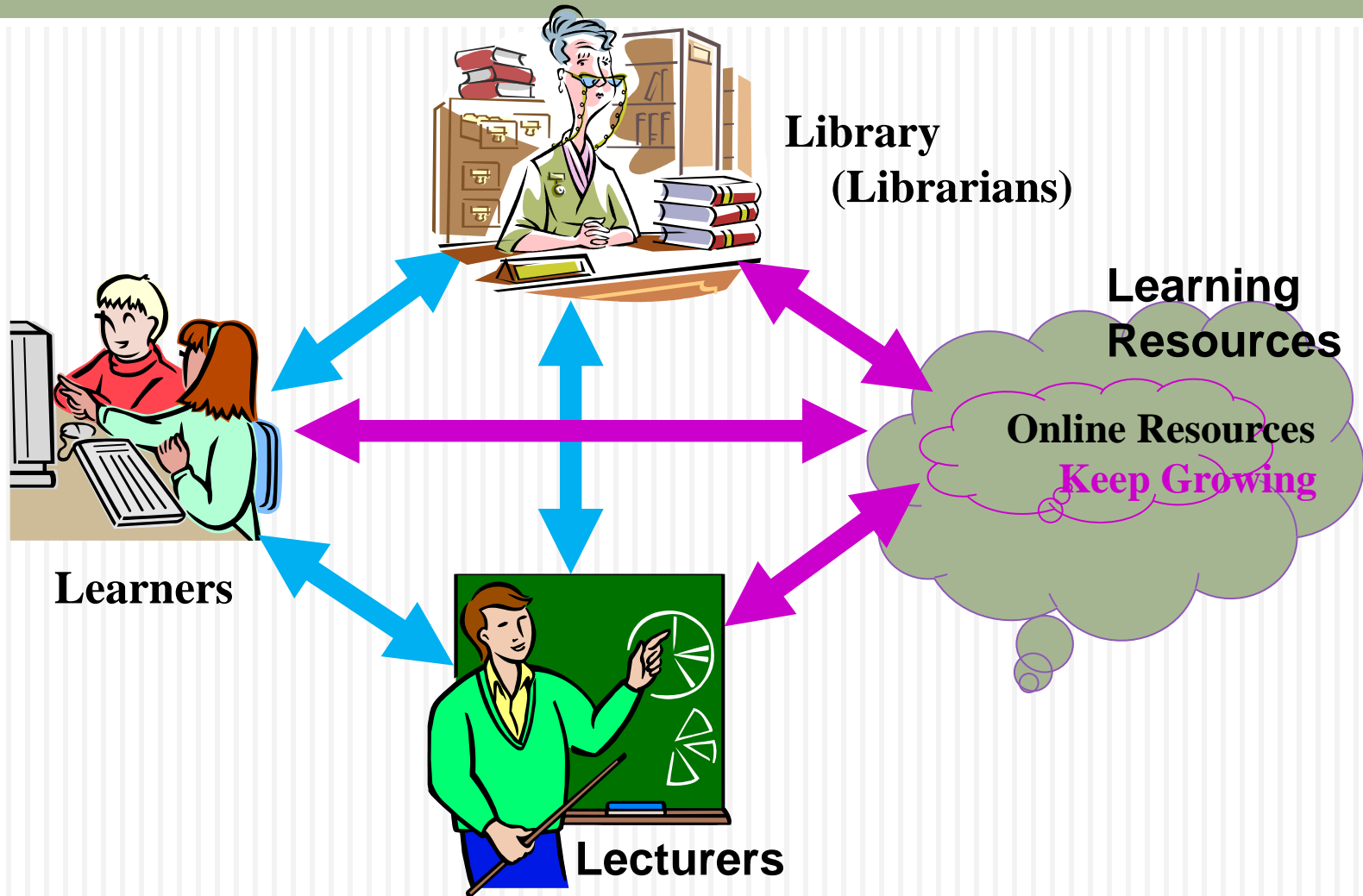
Ways & Environments of “Teaching” & “Learning” are Changed by Technology

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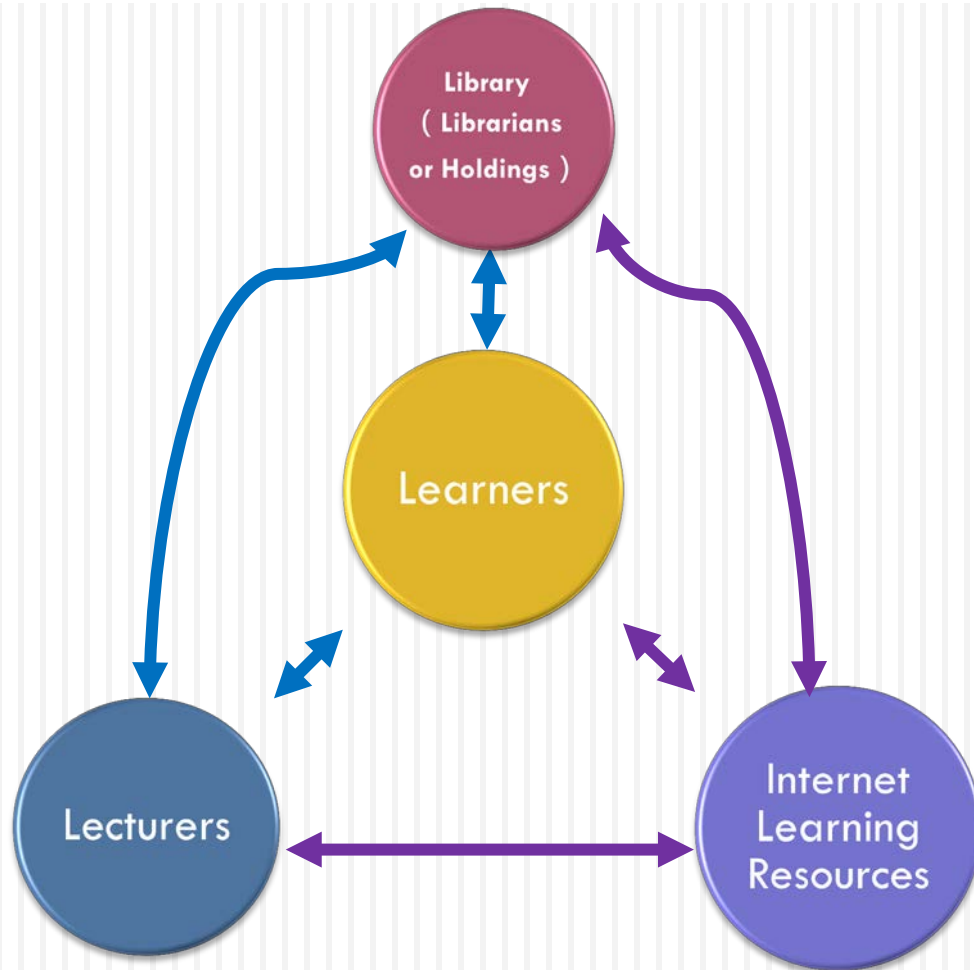
- Progression of ICT
 - ▣ Creates New Model of Spreading & Sharing of Information & Knowledge
 - ▣ Digitalized Learning Resources
- Nature of Teaching Space is Changed
 - ▣ Not Limited in Classroom
- Rapid Variations to “Learning Ways” & “Learning Gateways” & “Learning Types”
 - ▣ Learning Place: from Classroom to Internet
 - ▣ from Passive Learner to Active Learner
- Whole Environment of “Teaching” & “Learning” is Rapidly Transformed

Digital Library & Learning Environment

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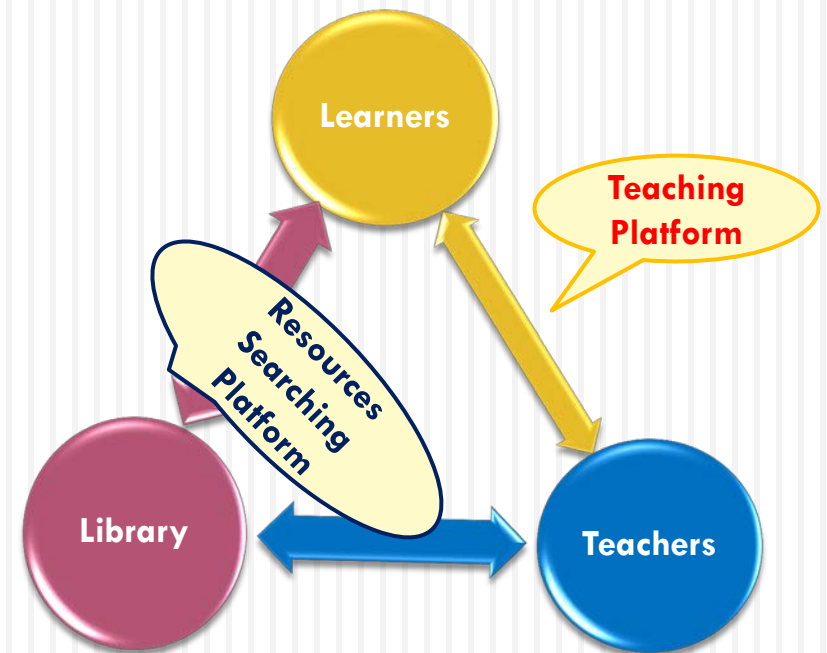
Learning Environment based on Learners



- Rapid Increasing Digital Learning Content & Resources
- Rapid Changing Learning Tools & Environment
 - ▣ Mobile Devices & Information Clouds
- Learners' **Self-learning Capability**
- Teaching **Suitable for Each Specific Learner**
- Digital Library Resources & **Intelligent** Information Services

Teaching & Lecturers & Library (I)

- Past: Only Print
 - ▣ Classroom is the Main Place for Teaching
 - Textbooks in Handwriting & Print
 - ▣ Library is not only the Building to collect or store the books but also the Studying Center
- Now: Print + Digital
 - ▣ Classroom + Online Teaching Platform
 - Teaching: Digital Teaching Materials & Print Textbooks & Blackboard
 - Learning: Lecture-Listening & Note-Taking & Multi-Interaction
 - **Teaching Platform** that Saves the Lesson Plans and e-Portfolio is an Assistant Communication Platform for Teaching.
 - **Flipped Teaching**



Teaching & Lecturers & Library (II)

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□ Now: Print + Digital

▣ Hybrid Library

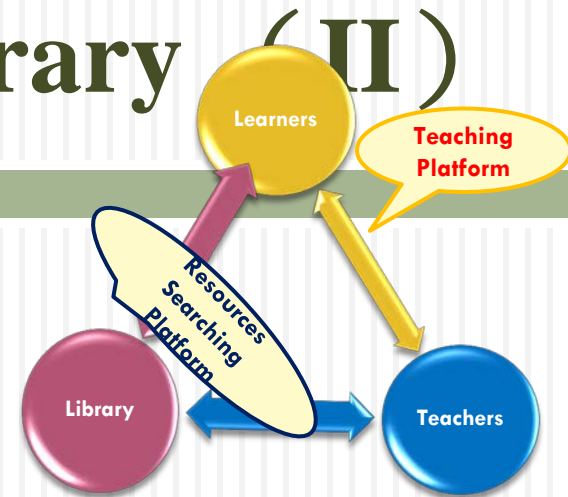
- Diverse Rich E-Resources
- Platform allows Readers Search & Explore the Digital Resources
 - Direct Download or Online Read
- Learning Commons

□ Future: Paperless Environment

▣ Complete Digital Teaching Materials & Online Teaching Platform & **Online Lecture**

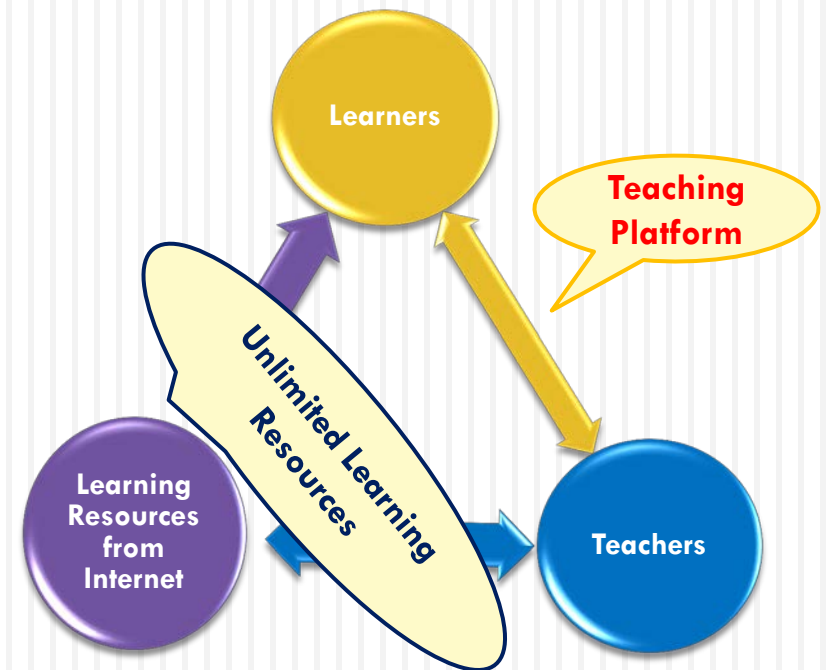
- No More Classroom for Teaching
- Classroom is for Students' Gathering

▣ Bookless Library



Teaching & Learners & Internet Learning Resources (I)

- Now
 - Internet Resources *Replace* Library ?
 - Teaching: Digital Teaching Materials are originated from internet resources contain the vivid funny **animations** and the **easy to be understood** abstruse theories...
 - Learning: part of information and knowledge & undetermined the validity of data & Search for the homework answers on the internet & Plenty of Data...
 - Teachers are responsible to **Guide** and **Carefully Select the good website resources** to meet Learners' demands of Reading and Learning



Teaching & Learners & Internet Learning Resources (II)

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Open Courses (Record & Save the Content of Courses)

The screenshot shows the MIT OpenCourseWare website. The top navigation bar includes "MITOPEN COURSEWARE MASSACHUSETTS INSTITUTE OF TECHNOLOGY" and a search bar. The main content area features a "History" course page with a historical map and a "Give Now" button. Below the main content, there is a section for "OCW NCTU Open CourseWare" with a navigation menu and a large video player. The video player displays the text: "歡迎進入交通大學開放式課程" and "初期提供了來自海峽兩岸五所交通大學的精彩課程".

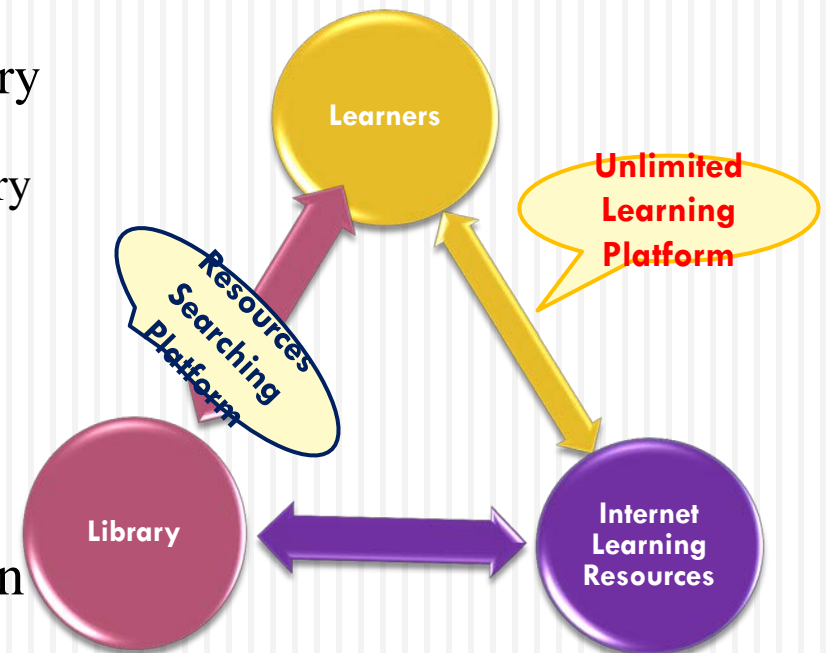
MOOCs in Taiwan

The screenshot shows the MOOCs in Taiwan website. The top navigation bar includes "席課師 MOOCs" and a search bar. The main content area features a banner with the text "開放課程 X 自主學習" and "共同打造華人數位學習新典範". Below the banner, there is a section for "目前搜尋條件 (48門)" with a search bar and a list of course listings. The course listings include "自媒體傳播-大學小專課程人人都是大專" and "色彩照明影像科技概論".

Online Courses & Earn Credits

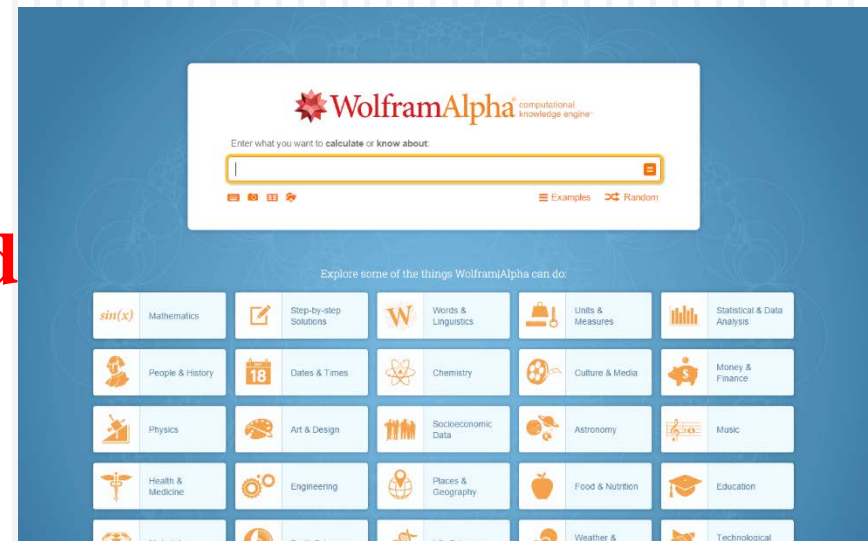
Learners & Library & Internet Learning Resources

- Learners Only Rely On **Internet Learning Resources** ?
 - ▣ Basic Knowledge Learned from Classroom + External Data Learned from Internet
 - ▣ *Borrow Print Books from & Study in Library*
 - Access Digital Learning Resources through Resources Searching Platform built in Library
- **Learners are Guided to Access Library Resources** with Social Communities from Library
 - ▣ Google scholar + SFX
 - ▣ FB+SFX
- Many Great Learning Resources and Open Access Journals that are searched and provided by the Librarians...



Cloud Learning Environment

- **Five Features**
- **Environment**
- **Teaching & Learning Resources & Personal Learning Cloud**



<https://www.wolframalpha.com/>

Five Features of Cloud Computing

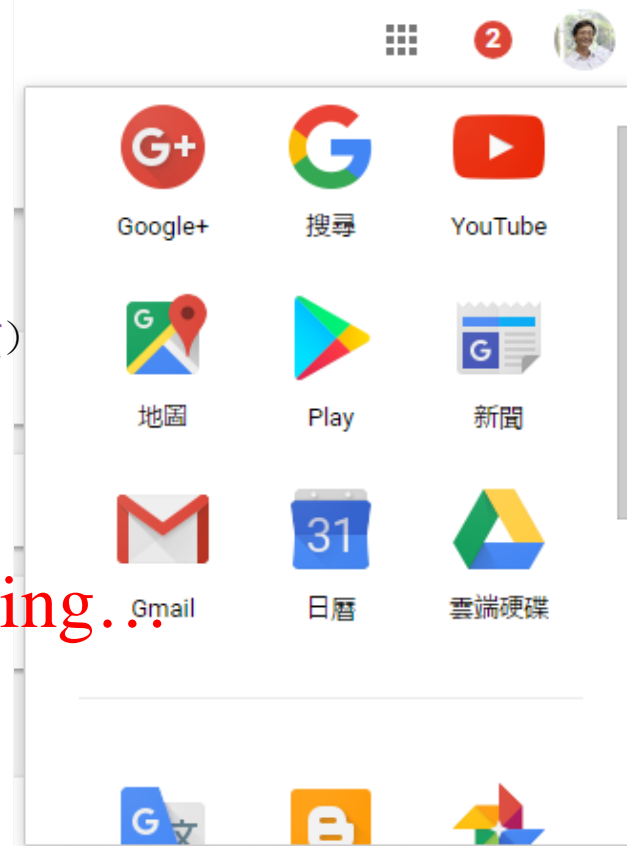
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- The NIST Definition of Cloud Computing
 - ▣ On-demand self-service
 - ▣ Broad network access
 - ▣ Resource pooling
 - ▣ Rapid elasticity
 - ▣ Measured service

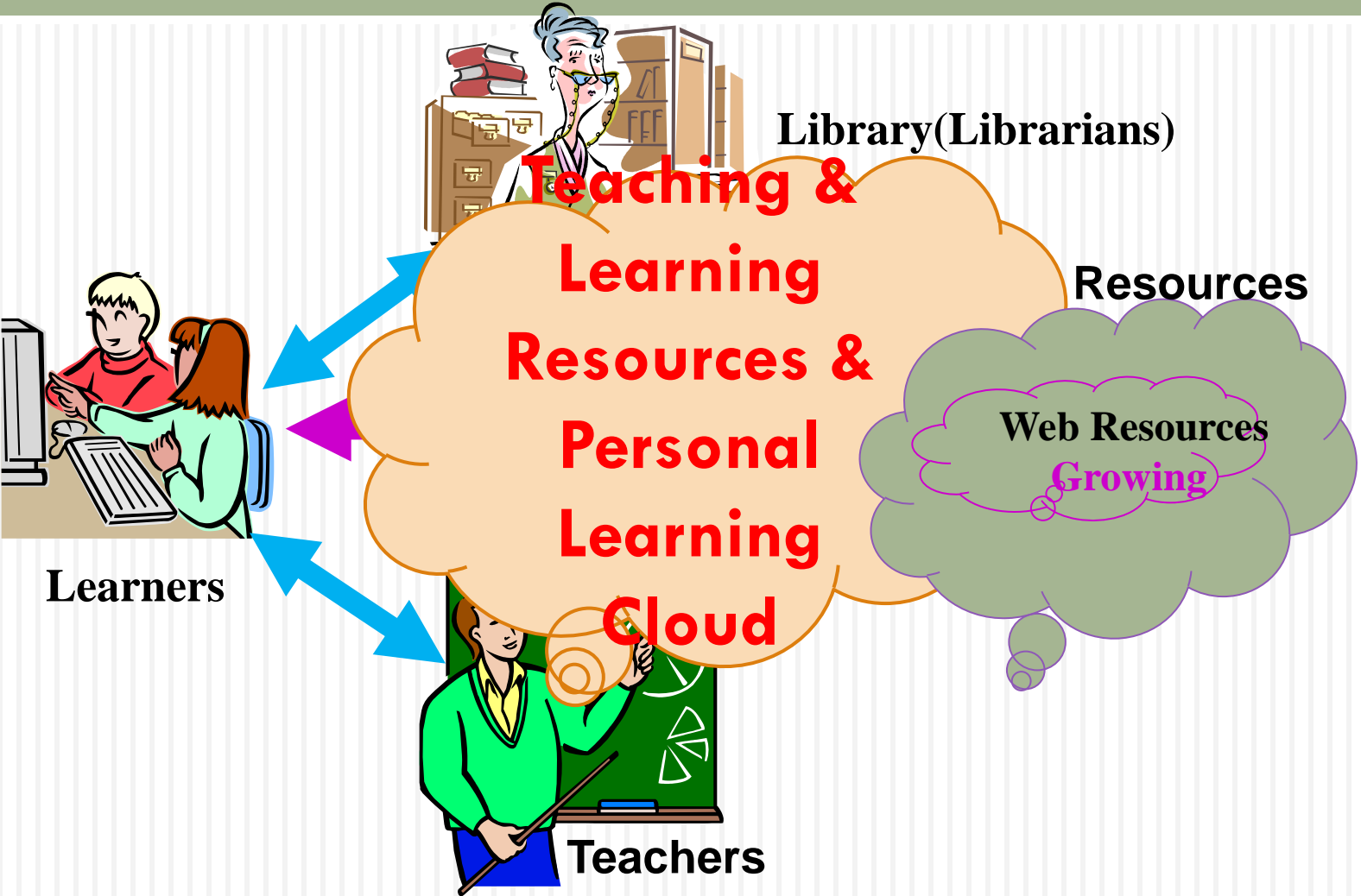
(<http://nvlpubs.nist.gov/nistpubs/Legacy/SP/nistspecialpublication800-145.pdf>)

- Cloud Services from Google
 - ▣ Rapid Elasticity with App Engine

- Personalized Services & Resources Sharing...
.....it's so easy



Cloud Digital Library & Learning Environment



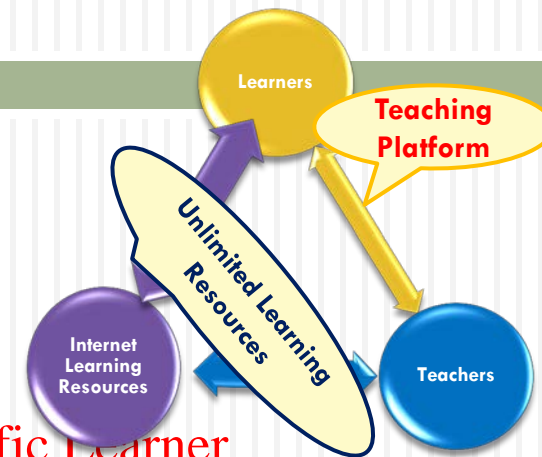
Teaching & Learning Resources & Personal Learning Cloud (I)

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- Integration of Teaching Systems
 - Digital Library System & Teaching Platform & Other Related Systems all are integrated in **Cloud System(Education Cloud ?)**
 - Resources Sharing & Seamless Network among the Systems
- Big Data & Personalized Service
 - Digital Library & Learning Resources Big Data Analysis
 - **Intelligent** Data Tree & Subject Analysis
 - Personal Preference Attributes Analysis
 - **Intelligent** Personalized Services
- Personal Knowledge Management Platform
 - **Lifelong Learning e-Portfolio**

Teaching & Learning Resources & Personal Learning Cloud (II)

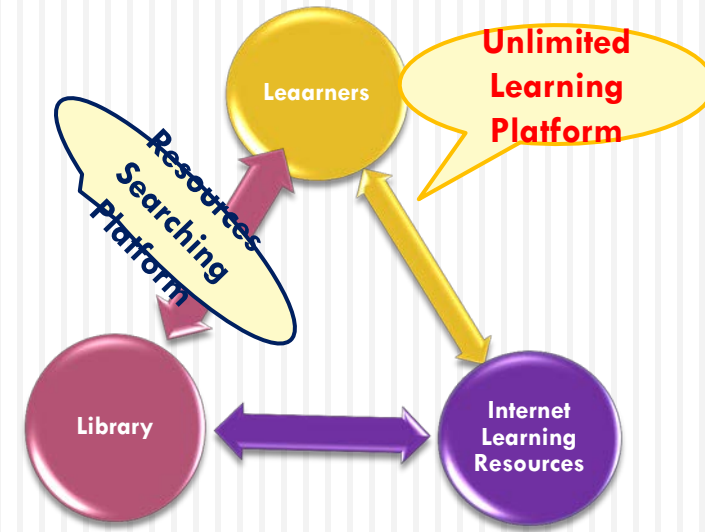
- **Cloud Intelligent** Online Learning Environment
 - ▣ Learning Resources **Big Data** + **Analyze** the Resources Suitable for Personal Learning
 - Advancement of Big Data Analysis
 - Teaching: Excellent Environment for **Teaching by Specific Learner** could find the Teaching Materials Suitable for the Teachers and the Proper Teaching Way for Each Learner
 - **Actively Offer** Teachers High-Quality Teaching Materials such as Google Scholar Analysis
 - Actively Offering after RSS with High-Quality Teaching Plans
 - Learning: Efficient Self-Learning with the Needed Resources analyzed from Learning e-Portfolio
 - **Actively Provide** the Necessary Resources and Assignment Answers for Learning
 - Learning e-Portfolio
 - Teachers and Learners **Co-compile(create)** Internet Teaching Resources



Cloud Assistant Learning Digital Library

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- Learners-Centered Platform
 - ▣ Resources Relevant to Learning Courses
 - In accordance with Learner's Level
 - ▣ Related Resources Interests Learners
 - ▣ ...
- Archive & Reuse
 - ▣ Preserve all Learning Resources of Learners
 - ▣ Review & Update
- Interact with Learners
 - ▣ New Information
 - ▣ Learners' works & Experiences Feedbacks
- Helps for Operating of Digital Learning Community
- Help Learners Answer the Questions and Train their Information Literacy Competency
 - ▣ Offer Information Literacy Education Online Courses integrated with Discipline Fields

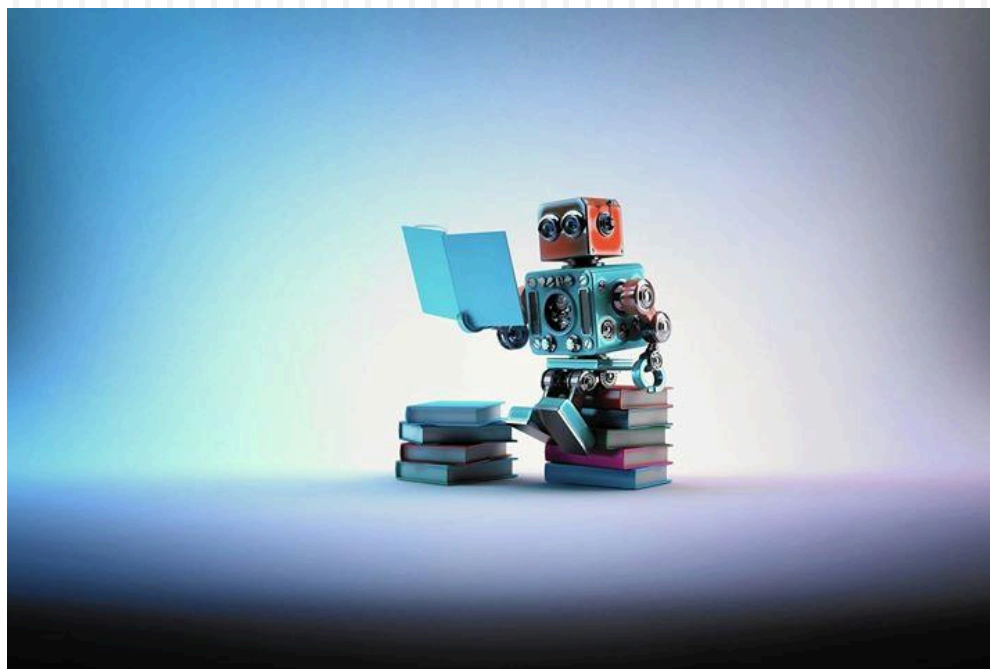


Conclusion & Prospect

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- Development & Advancement of ICT is Fundamental, but Setup of **High-Quality Learning Resources** or **Digital Library** is more Important.
- **Learners-Centered** Learning Environment
 - Learners: Important to Determine the Accuracy of Data & **Capability of Self-Learning**
 - Teachers: Core Ideas of **Teaching by Specific Learner** is more Important; **Completely Guide & Organize** & Provide the Reading & Learning Digital Resources suitable for Learners
 - Library: Actively Provides Learners-Centered Resources to meet the Needs of Curricula in order to become the **Learning Center**
- Build the Personal Knowledge Management Platform for the Learners in the coming Cloud Era
 - **Lifelong Learning e-Portfolio** & **Personal Knowledge Management Center**
 - **Share** & Reuse & Re-organize & Re-create & **Preserve** Knowledge

Thanks for Your Attention



Source: <http://outdonews.com/news/480127/opinion-hero-librarians-create-fake-reader-save-books-outsmart-algorithms>
(1/21/2017)