

翻轉教室

陳祖裕



聲明

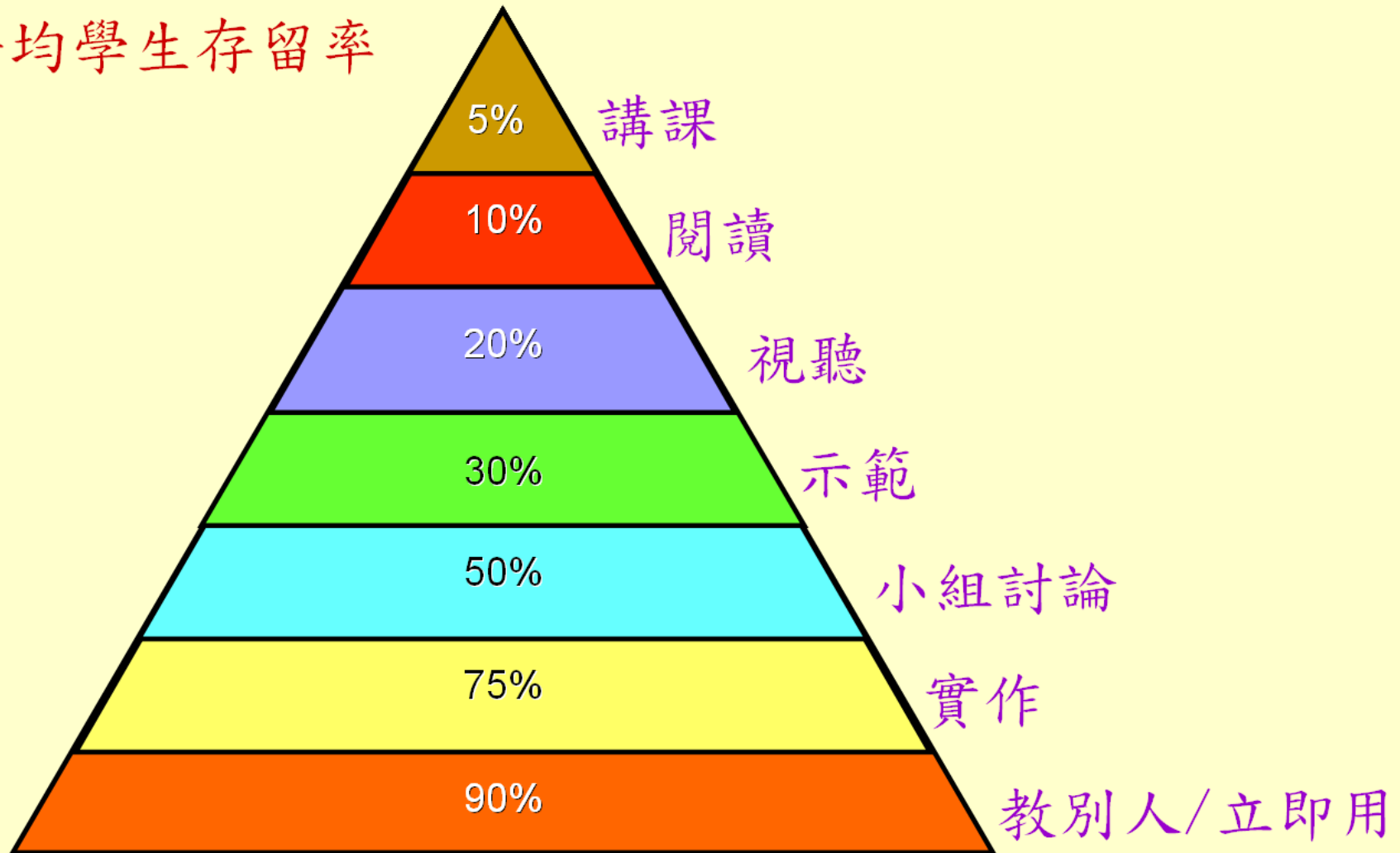
- 本人與簡報內容提及之商業機構無任何財務利益關係

報告大綱

- 前言
- 翻轉教室的發展
- 翻轉教室的理論
- 翻轉教室的執行
- 結語

Learning Pyramid

平均學生存留率

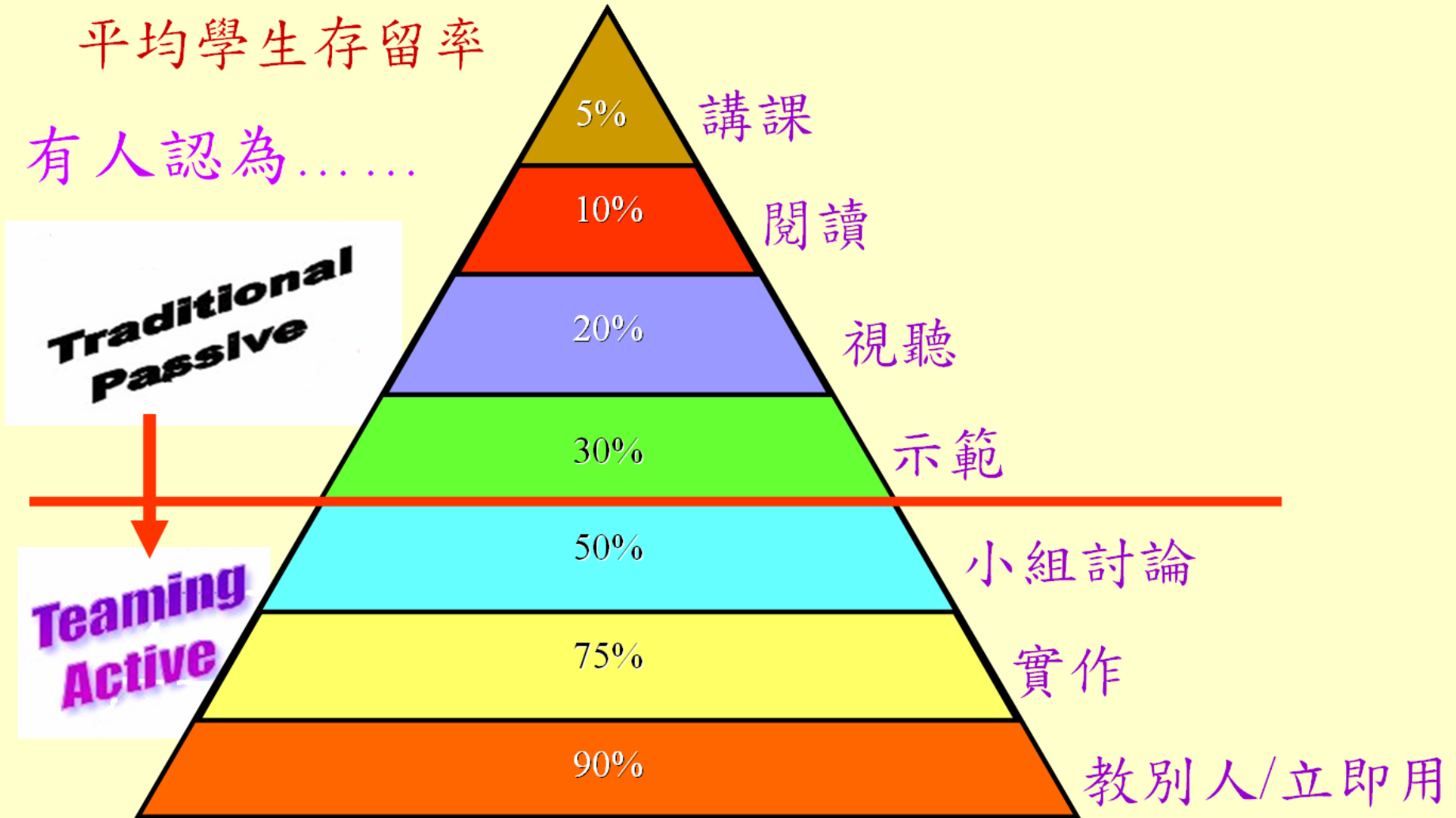


來源：美國國家訓練實驗室

Learning Pyramid

平均學生存留率

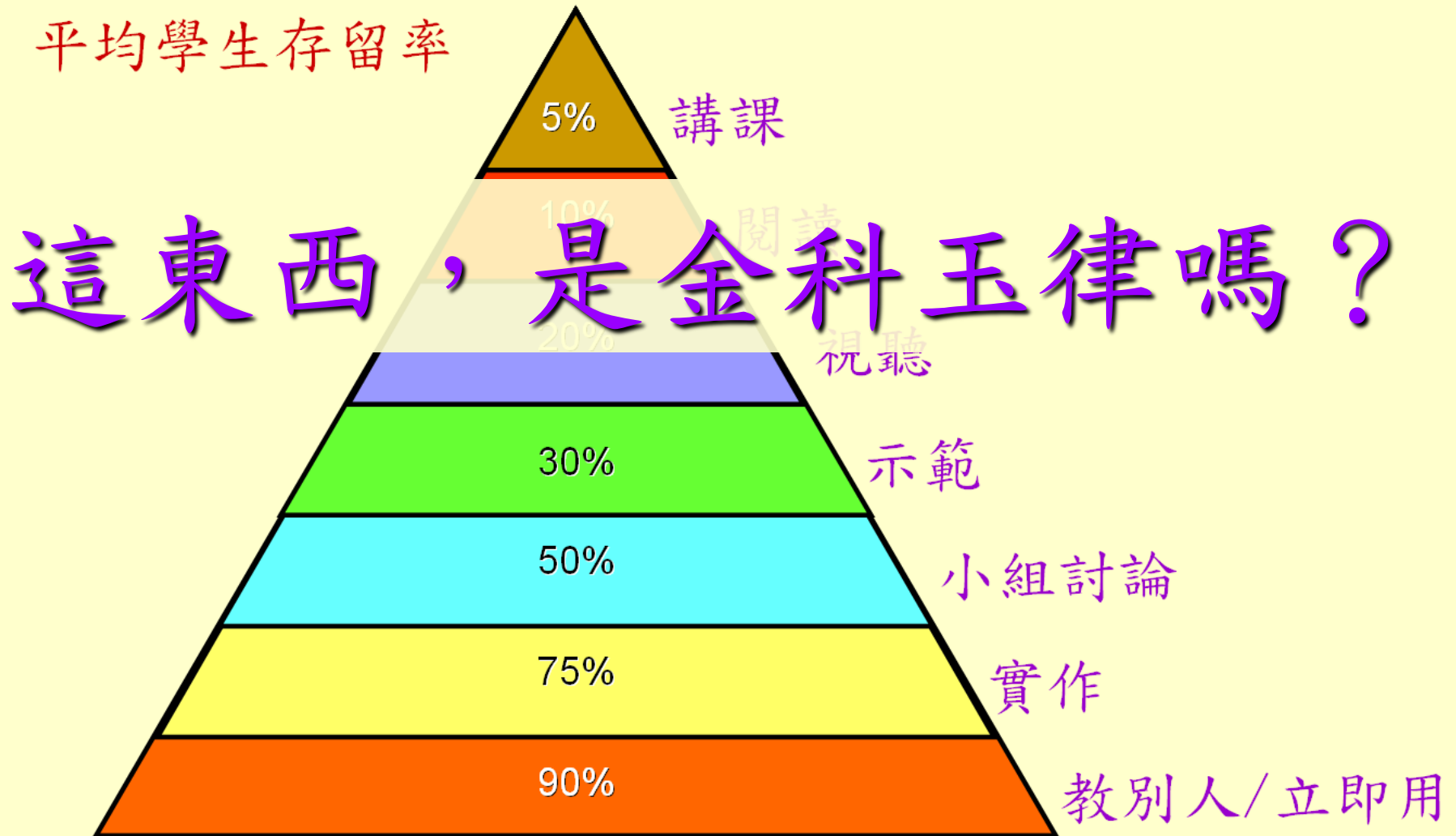
有人認為.....



來源：美國國家訓練實驗室

Learning Pyramid

平均學生存留率



來源：美國國家訓練實驗室



<http://www.learningandteaching.info/learning/myths.htm>

Myths and Misconceptions

The world of teaching and learning is rife with received wisdom, including the potency of **learning styles** (which deserves a page to itself), and plenty of other unproven but fashionable ideas.

It is not so much that they are "wrong", but: 不全然是"wrong"，但.....

- the evidence base and/or research methodology may be flaky, and/or 缺實證
- they may have been misinterpreted and generalised beyond their legitimate use, and/or 被誤解
- they originate from such tightly controlled laboratory settings as not to make sense in the real world. 不實際



Why the 'learning pyramid' is wrong

By Valerie Strauss

March 6, 2013

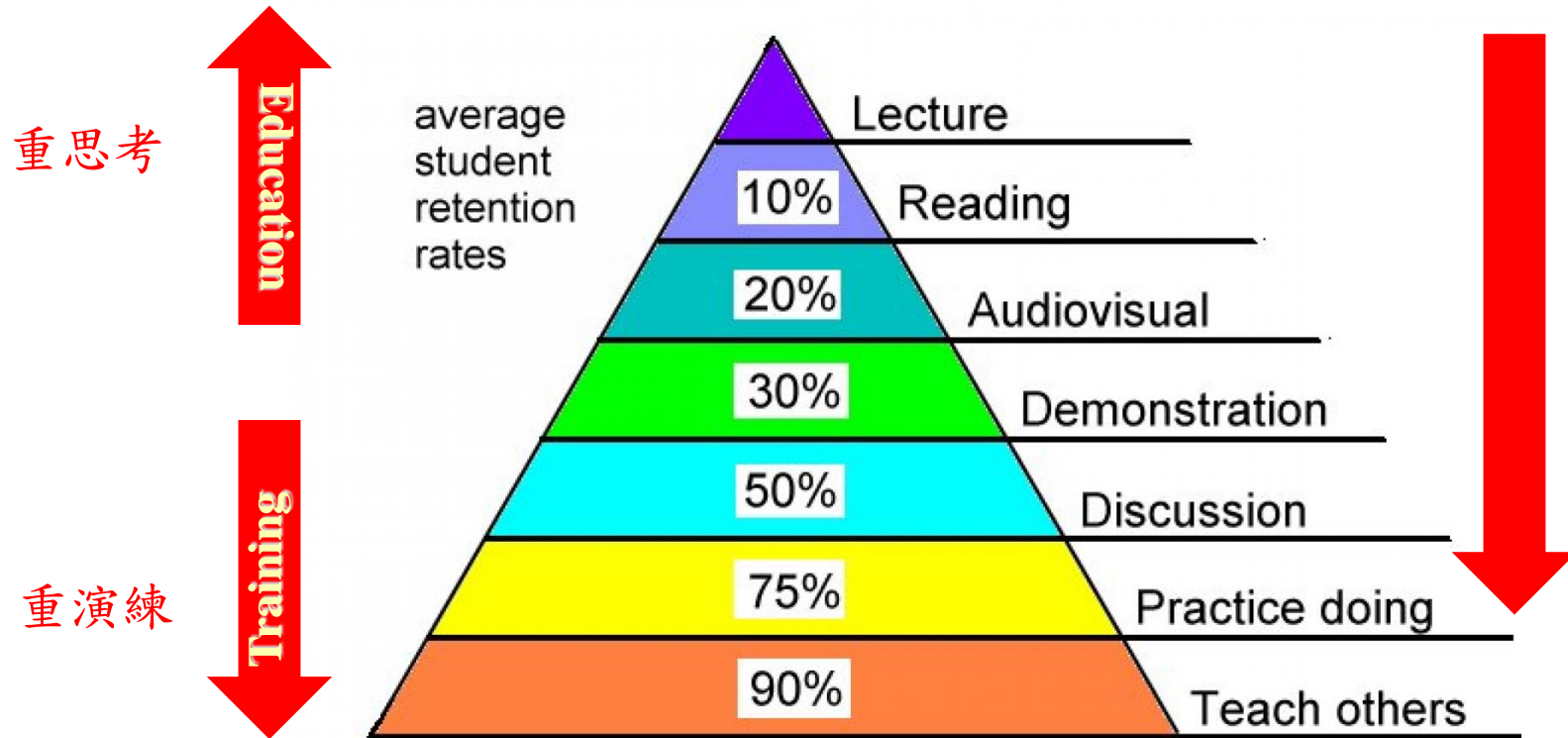


A lot of people believe that the “learning pyramid” that lists learning scenarios and average student retention rates is reliable. Here’s cognitive scientist Daniel Willingham to explain why it isn’t. Willingham is professor and director of graduate studies in psychology at the University of Virginia and author of “Why Don’t Students Like School?” His newly published book is “When Can You Trust The Experts? How to tell good science from bad in education.” This appeared on his Science and Education blog.

So many variables affect memory retrieval, that you can’t assign specific percentages of recall without specifying many more of them:

- **what material is recalled** (gazing out the window of a car is an audiovisual experience just like watching an action movie, but your memory for these two audiovisual experiences will not be equivalent) 要記的是什麼？
- **the age of the subjects** 對象是什麼人？
- **the delay between study and test** (obviously, the percent recalled usually drops with delay) 相隔多少時間？
- **what were subjects instructed to do** as they read, demonstrated, taught, etc. (you can boost memory considerably for a reading task by asking subjects to summarize as they read) 所教的是什麼？
- **how was memory tested** (percent recalled is almost always much higher for recognition tests than recall) 測驗方式為何？
- **what subjects know about the to-be-remembered material** (if you already know something about the subject, memory will be much better) 先前了解多？

Training Pyramid

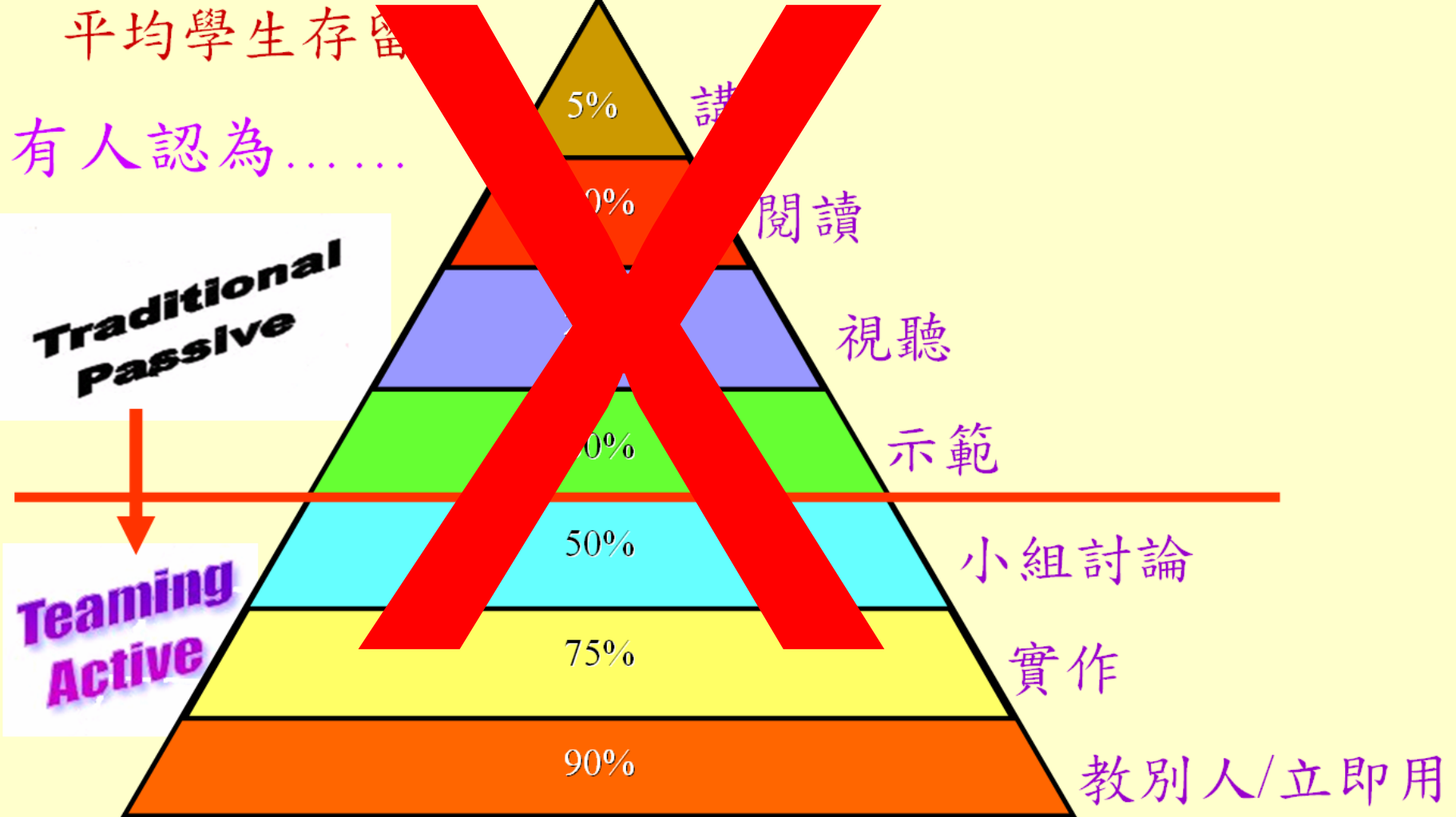


Source: National Training Laboratories, Bethel, Maine

學生若欠缺理解力便愈要往下著力

原來，指的是訓練，不是教育！

Learning Pyramid



來源：美國國家訓練實驗室

Learning Pyramid

各種教學方法

平均學生存留率

有人認為

都各具角色

Traditional
Passive

講課

10%

20%

視聽

應在適當的時機

Teaming
Active

30%

示範

小組討論

採用適當的方法

75%

實作

教別人/位運用

90%

來源：美國國家訓練實驗室

多元化學習

以導師為中心

以學員為中心



didactic-
'in your head'

experiential-leading
deeper discussion/
understanding

experiential-leading to
action/change
in behavior

領悟與體驗並重

Three Innovative Methods of Teaching for High School Educators

Posted February 4, 2013 in [Tips for Educators](#)

Innovative methods of teaching are a goal of many educators. Teaching students in ways that keep them engaged and interested in the material can sometimes be a challenge. In the short-attention span world we live in, it can be harder than ever to keep high school students excited and engrossed in learning.

Visualization, technology tools and active learning

看見觀念

應用科技

主動學習

INTRODUCTION

PROCURERS



TEACHERS

STUDENTS


Visualizing

Making mental images

Picture details & events to increase understanding



Teacher sketch from pg.1



Teacher sketch from pg.1

- Why did I draw this picture?
- What details are important?
- What does this show about the subject, character, main idea, theme, etc.?

13

Innovative Method of Teaching ?

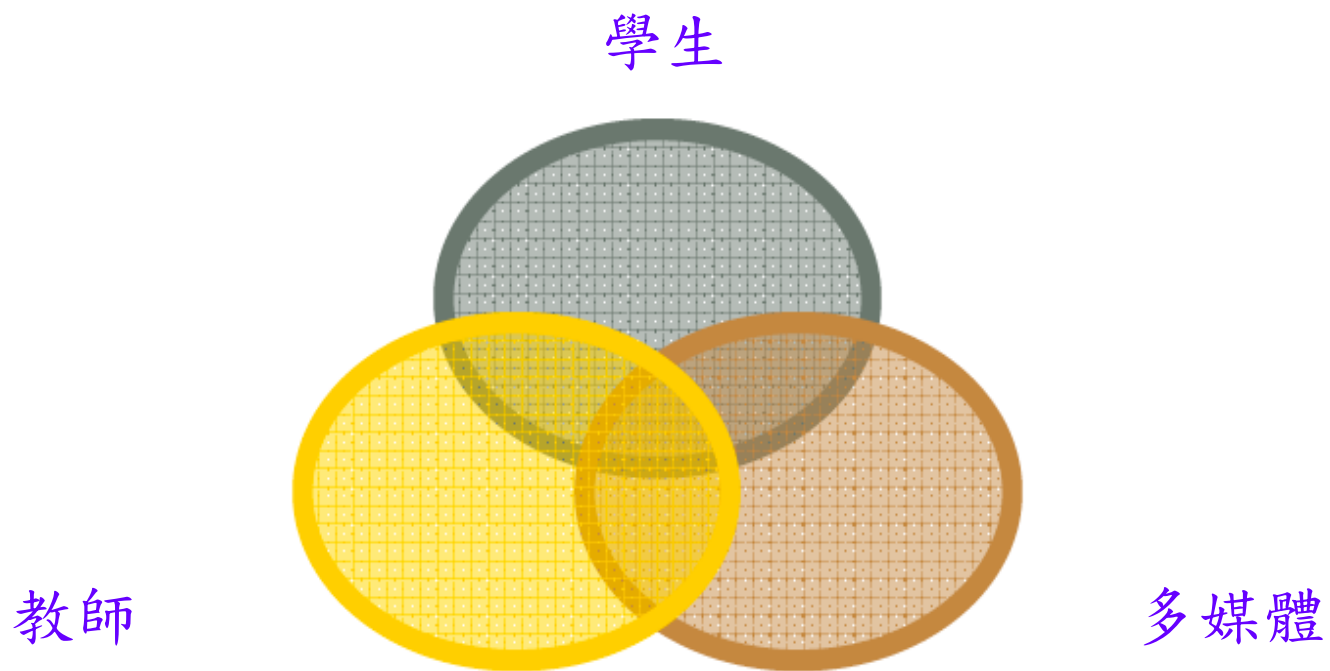
- ❑ Multimedia learning process : blended learning, flipped classroom, team-based learning
- ❑ Mind map
- ❑ Teaching with sense of humour– “Humour an effective medium of teaching ”
- ❑ Z to A approach
- ❑ Mnemmonics words- words – words approach
- ❑ Role playing and scenario analysis based teaching

教學創新？

- ❑ Problem-based learning 1960s
- ❑ Task-based learning 1990s
- ❑ Narrative medicine/storytelling 1990s
- ❑ Critical reflection 1990s
- ❑ Blended learning/**flipped classroom**/team-based learning 1990s
- ❑ Micro-learning 2000s

教育領域的進展甚慢，很容易跟得上.....

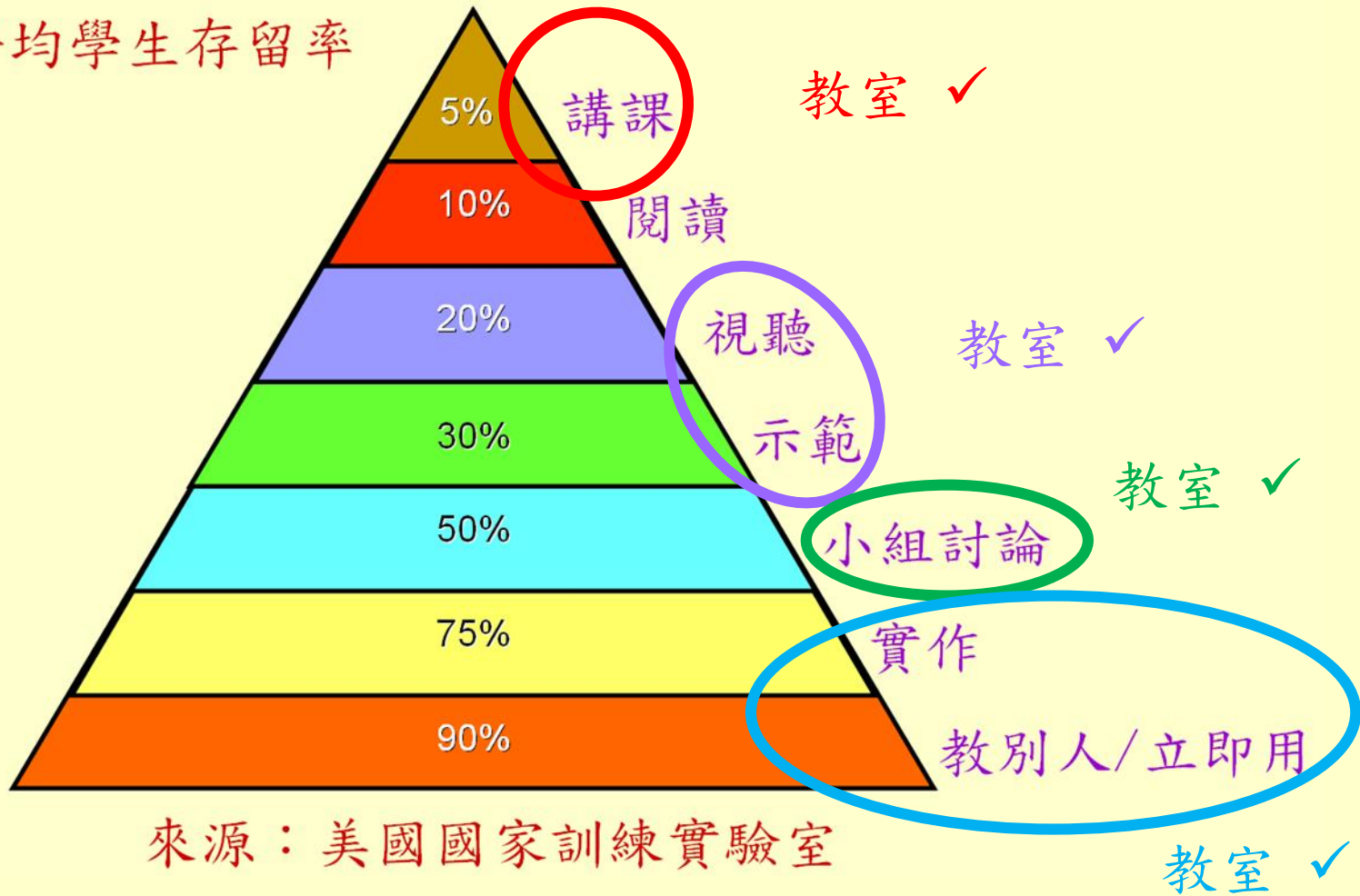
三角關係：學生—教師—多媒體



翻轉教室

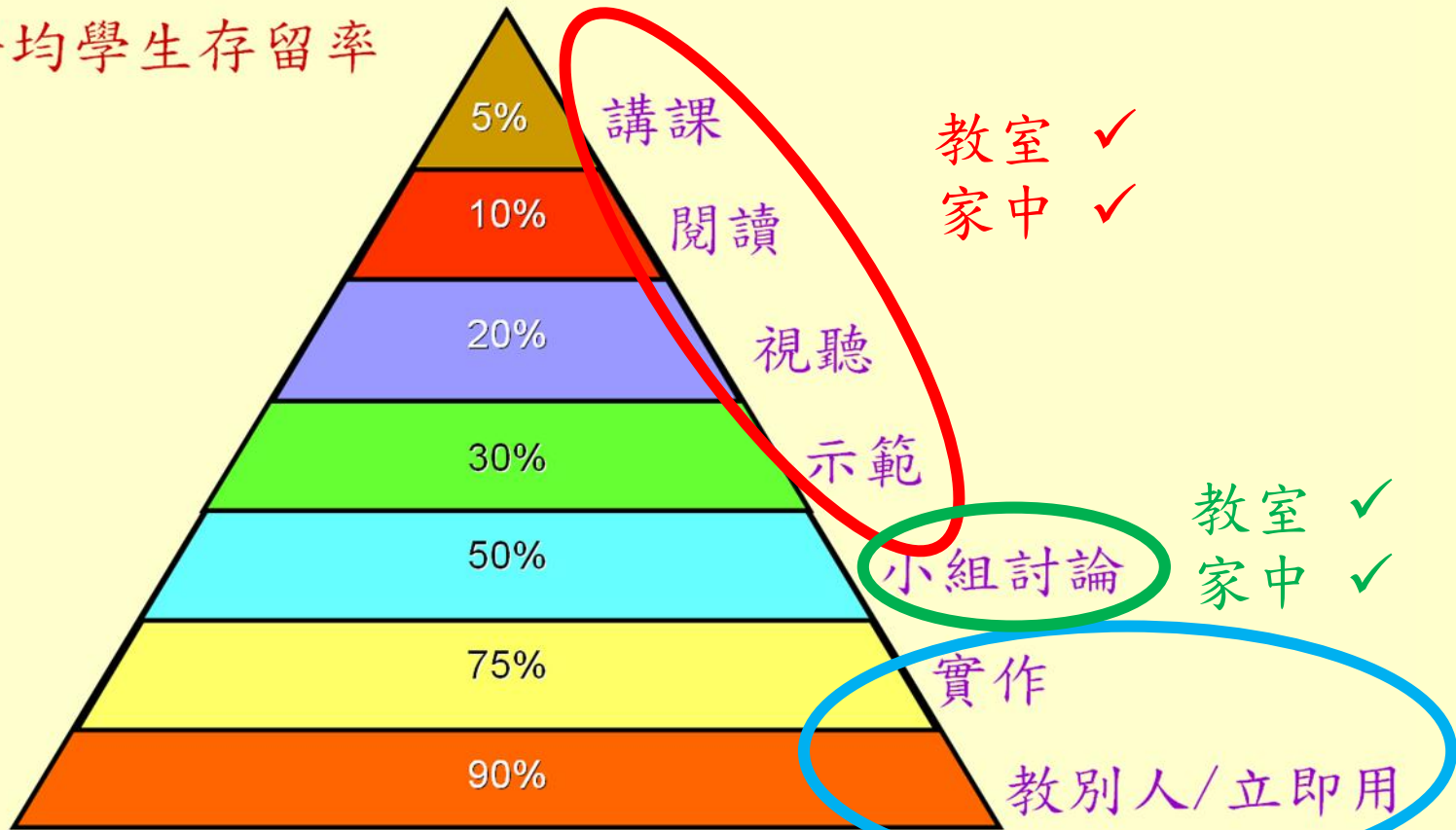
資訊網絡不發達的年代

平均學生存留率



資訊網絡普及的年代

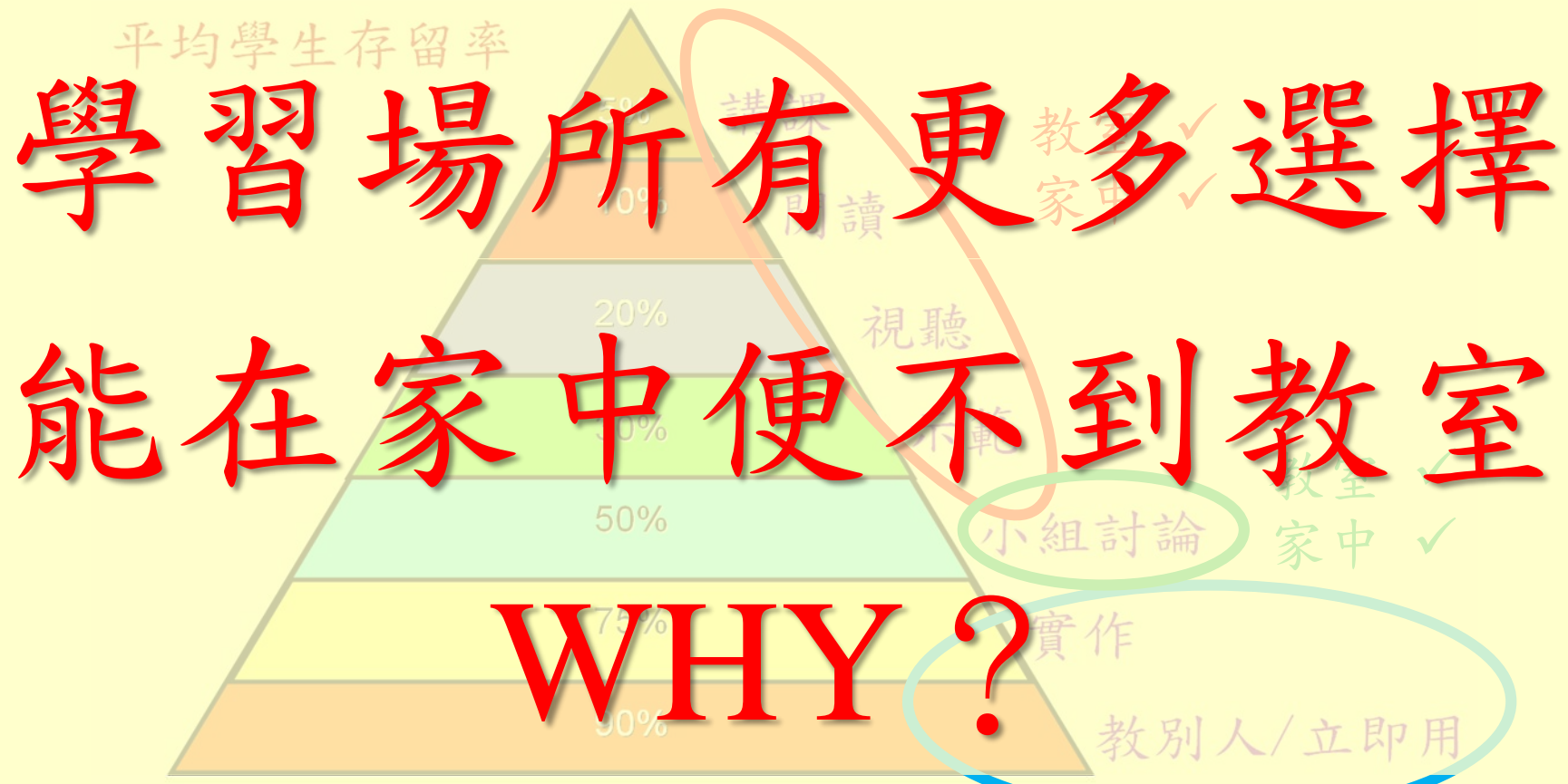
平均學生存留率



來源：美國國家訓練實驗室

教室 ✓
家中 ✗

資訊網絡普及的年代

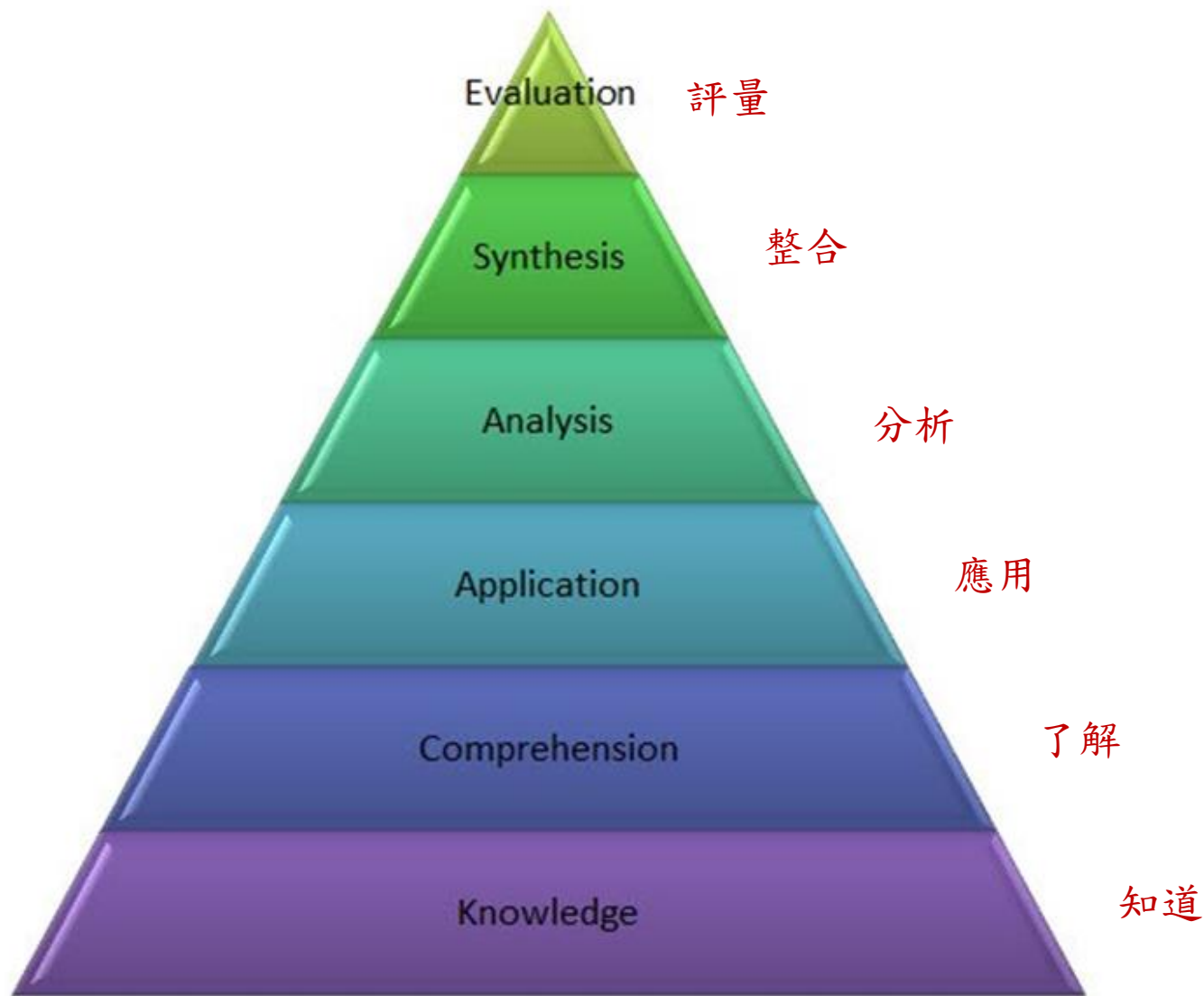


來源：美國國家訓練實驗室

教室 ✓
家中 ✗

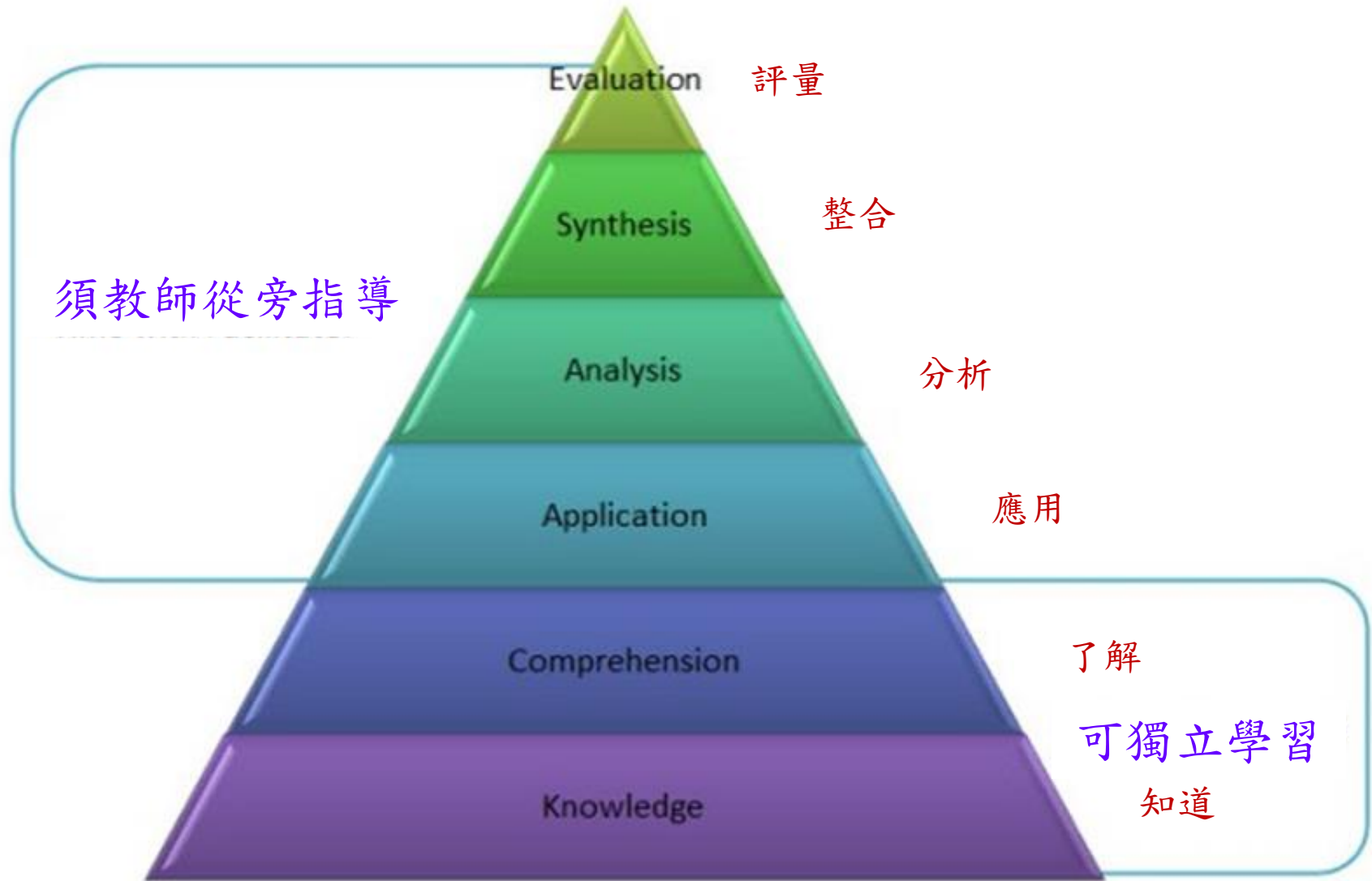
有教師同在時多專注於Bloom氏分類中哪一層級的學習？

What level of Bloom's Taxonomy is being addressed while you're with the facilitator?



教師宜從旁指導較高層級的學習

Facilitator time is primarily used in the top layers.



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History of Flipped Classroom



- Eric Mazur : peer instruction, 1990s
 - 電腦輔助教學可讓老師「指導」而非「講課」

埃里克·馬祖爾（1954年11月14日出生於阿姆斯特丹）是哈佛大學的知名物理學家和教育家，也是教育和技術市場科技創業的企業家。馬祖爾的研究是實驗超快光學和凝聚態物理。

History of Flipped Classroom



- Alison King* (*College Teaching*, 1993): “From Sage on the Stage to Guide on the Side”

由：站在教壇的智者
至：來到身旁的指導

- * Associate professor of education in the College of Education at California State University in San Marcos.

Developmental Psychology, Educational Psychology, Cognitive Science

From Sage on the Stage to Guide on the Side

Alison King

In most college classrooms, the professor lectures and the students listen and take notes. The professor is the central figure, the “sage on the stage,” the one who has the knowledge and transmits that knowledge to the students, who simply memorize the information and later reproduce it on an exam—often without even thinking about it. This model of the teaching-learning process, called the transmittal model, assumes that the student’s brain is like an empty container into which the professor pours knowledge. In this view of teaching and learning, students are passive learners rather than active ones. Such a view is outdated and will not be effective for the twenty-first century, when individuals will be expected to think for themselves, pose and solve complex problems, and generally produce knowledge rather than reproduce it.

According to the current constructivist theory of learning, knowledge does not come packaged in books, or journals, or computer disks (or professors’ and students’ heads) to be transmitted intact from one to another. Those vessels contain information, not knowledge. Rather, knowledge is a state of understanding and can only exist in the mind of the individual knower; as such, knowledge must be constructed—or re-

constructed—by each individual knower through the process of trying to make sense of new information in terms of what that individual already knows. In this constructivist view of learning, students use their own existing knowledge and prior experience to help them understand the new material; in particular, they generate relationships between and among the new ideas and between the new material and information already in memory (see also Brown, Bransford, Ferrara, and Campione 1983; Wittrock 1990).

When students are engaged in actively processing information by reconstructing that information in such new and personally meaningful ways, they are far more likely to remember it and apply it in new situations. This approach to learning is consistent with information-processing theories (e.g., Mayer 1984), which argue that reformulating given information or generating new information based on what is provided helps one build extensive cognitive structures that connect the new ideas and link them to what is already known. According to this view, creating such elaborated memory structures aids understanding of the new material and makes it easier to remember.

In contrast to the transmittal model illustrated by the classroom lecture-note-taking scenario, the constructivist model places students at the center of the process—actively participating in thinking and discussing ideas while making meaning for themselves. And the professor,

instead of being the “sage on the stage,” functions as a “guide on the side,” facilitating learning in less directive ways. The professor is still responsible for presenting the course material, but he or she presents that material in ways that make the students do something with the information—interact with it—manipulate the ideas and relate them to what they already know. Essentially, the professor’s role is to facilitate students’ interaction with the material and with each other in their knowledge-producing endeavor. In the constructivist model the student is like a carpenter (or sculptor) who uses new information and prior knowledge and experience, along with previously learned cognitive tools (such as learning strategies, algorithms, and critical thinking skills) to build new knowledge structures and rearrange existing knowledge.

But how do we get from transmission of information to construction of meaning? Such a change can entail a considerable shift in roles for the professor, who must move away from being the one who has all the answers and does most of the talking toward being a facilitator who orchestrates the context, provides resources, and poses questions to stimulate students to think up their own answers.

Change is never easy; usually, however, changes are easier to bring about by modifying existing practices than by starting afresh. So, we will begin by looking at some practical active-learning activities that can be incorporated into a typical lecture; then we will move on to

History of Flipped Classroom

- Maureen J. Lage*, Glenn J. Platt* & Michael Treglia :
**“Inverting the Classroom:
 A Gateway to Creating an
 Inclusive Learning
 Environment”**

將教室反轉：
 創造「包容性學習環境」
 的入口

(Journal of Economic Education, 2000)

Economic Instruction

In this section, the *Journal of Economic Education* publishes articles, notes, and communications describing innovations in pedagogy, hardware, materials, and methods for treating traditional subject matter. Issues involving the way economics is taught are emphasized.

MICHAEL WATTS, Section Editor

Inverting the Classroom: A Gateway to Creating an Inclusive Learning Environment

Maureen J. Lage, Glenn J. Platt,
 and Michael Treglia

Recent evidence has shown that a mismatch between an instructor's teaching style and a student's learning style can result in the student learning less and being less interested in the subject matter (Borg and Shapiro 1996; Ziegert forthcoming). This finding implies that either educational administrators should strive to ensure a good match between the instructor's teaching style and the students' learning styles (a difficult task) or that concerned instructors should use a portfolio of teaching styles so as to appeal to a variety of student learning types. Unfortunately, a majority of introductory economics courses are taught using only one teaching style—the traditional lecture format (Becker and Watts 1995).

The ability of instructors to vary teaching styles in introductory economics courses is seemingly limited by time constraints. If an instructor wanted to lecture for those students who learn best via lecturing, conduct experiments for the experiential learners, give group assignments for the collaborative and cooperative learners, and oversee self-directed study for the independent learners, then he would need to increase student contact time fourfold. However, both the proliferation of students' access to multimedia and the advances in ease of multimedia development for faculty have created an environment where these layers of

Maureen J. Lage is an associate professor of economics (e-mail: lagemj@muohio.edu) and Glenn J. Platt is an associate professor of economics at Miami University (Ohio). Michael Treglia is with Eli Lilly & Co., Indianapolis. The authors wish to thank three anonymous referees, Dan Terrio, Patricia Platt, The SBA Technology Center, Miami University Applied Technologies, and the participants in the Richard T. Farmer School of Business Administration Teaching Effectiveness Group for helpful comments. We would also like to thank the students who participated in the inverted classroom.

History of Flipped Classroom



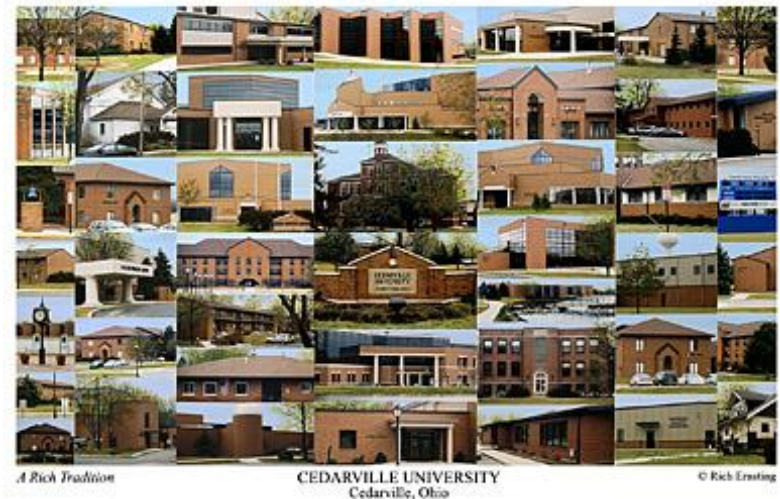
- J. Wesley Baker* 在第11屆College Teaching and Learning國際會議 (2000) 發表：

“The **classroom flip**: using web course management tools to become the guide by the side”

首先報告model of classroom flipping

教室翻轉：使用網絡課程管理工具成為旁邊的指引

* Distinguished Professor of Communications,
Cedarville University



History of Flipped Classroom

- 2000年秋，威斯康新大學麥迪遜分校的computer science課程以eTeach  軟體取代授課

Inception



Back in the early 90's, when most computer users were just beginning to migrate to the Internet over their slow dial-up connections, Greg Moses and Larry Landweber were already looking toward the future. They foresaw the coming bandwidth explosion and began to look for the "killer app" which would define the internet. Their answer: video.

Originally called "Learning on Demand", the fledgling project got underway courtesy of grants consisting of video servers and software from HP and Sun Microsystems. However, the project stalled due to technical difficulties surrounding the coordination of the two technologies and the lack of funding for further development of the software necessary.

This situation persisted until 1996, when, due to his involvement with the San Diego Supercomputer Center, Greg Moses was the recipient of another grant. Despite a lack of concrete direction regarding the ultimate usage of the fledgling technology, Mike Litzkow was brought on board to further develop the software needed.

As the software was developed, Greg and Mike began to work closely with the School of Education, **converting existing videotapes into digital materials that could be accessed over the Internet.** This partnership gave birth to the idea now know as eTeach.

Rather than simply posting research and training videos online, the goal became to **develop a teaching and learning system that incorporated audio, video and text to enhance the learning experience.** Despite the ambitious nature of this project, the first iteration of eTeach became available in 1999, less than two years after it was proposed.

History of Flipped Classroom



- 2004年秋，Salman Khan受他的表妹所託拍攝影片教她代數，她說如果有影片，她會跳過已經會的而可反覆看不會的⇒ Khan Academy videos

出生	1976 美國紐奧良
居住地	加利福尼亞州山景城
民族	孟加拉人
國籍	美國
母校	麻省理工學院 (BS, MS) 哈佛大學 (MBA)
職業	教育家 可汗學院執行董事

The World's 100 Most Influential People: 2012

Salman Khan

Educator

Like a lot of great innovators, Salman Khan didn't set out to change the world. He was just trying to help his teenage cousin with her algebra from across the country. But from a closet turned office in his Silicon Valley apartment, Sal, 35, has produced an amazing library of online lectures on math, science and a host of other subjects. In the process, he has turned the classroom — and the world of education — on its head.

The aspiration of khanacademy.org is to give every kid a chance at a free, world-class education. The site has over 3,000 short lessons that allow kids to learn at their own pace. Practice exercises send students back to the pertinent video when they're having trouble. And there's a detailed dashboard for teachers who use Khan Academy in their classrooms.



History of Flipped Classroom

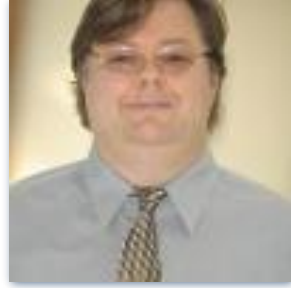


- 2006年Tenneson & McGlasson提出"The Classroom Flip"



在報告中，他們展示了教師在考慮翻轉教室時應該做出哪些選擇。特別是，教師需要提問他們最想在課堂上改變什麼，這報告有助於確定使用不同機制的翻轉如何能增強個人的教學過程。本報告以學習理論和動機說明學習者在這些精心策劃的課程和活動中可以增長更多的原因。它亦探討可以選擇的不同形式的電腦課程管理系統。

History of Flipped Classroom



- ❑ 2006年Bill Brantley在2006 American Political Science Association's Teaching and Learning Conference報告 **flipped classroom model**
- ❑ 描述如何使用兩個課堂會議的模擬場景，過程中示範如何將課程內容送至線上的學習管理系統（learning management system，LMS）

Adjunct Instructor, University of Maryland; University of Louisville (KY)

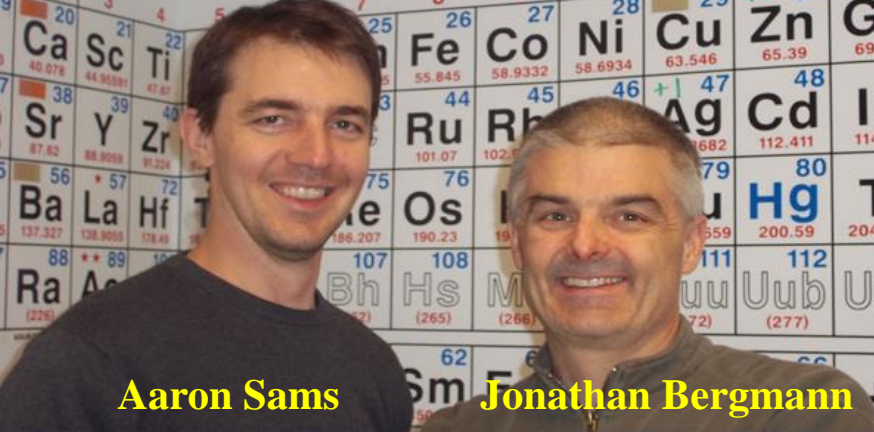
Specialties: project management, knowledge management, change management, innovation, strategic management, public administration, data science, research design, IT management, open source solutions .

History of Flipped Classroom



- 2007年Jeremy Strayer發表他在俄亥俄州立大學的博士論文：

The effects of the **classroom flip** on the learning environment: a comparison of learning activity in a **traditional classroom** and a **flip classroom** that used an intelligent tutoring system.



Aaron Sams


Jonathan Bergmann

flipped learning

GATEWAY TO STUDENT ENGAGEMENT

JONATHAN BERGMANN
AARON SAMS

The companion to
Flip Your Classroom



Flip YOUR Classroom

Reach Every Student
in Every Class Every Day

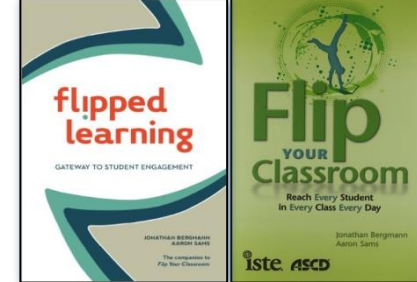
Jonathan Bergmann
Aaron Sams

 **iste.** **ASCD**

FlippedClass.com

The Flipped Learning Experts™

Jon Bergmann and Aaron Sams



喬恩伯格曼是推動翻轉教室的先驅、FlippedClass.com的首席學習官和Flipped Learning Network的共創始人。他與亞倫薩姆斯合著“***Flip Your Classroom: Reach Every Student in Every Class Every Day***”及“***Flipped Learning: Gateway to Student Engagement***”。縱觀喬恩擔任高中科學老師的24個年頭，他以一個壓倒一切的關注來指引他的教學：面對面上課時最好的方式是什麼？隨著喬恩的創新和韌性的結果，於2002年他獲得了數學和科學教學卓越的總統獎，並於2010年被提名科羅拉多年度教師進入準決勝階段。他與人共同創立一個非營利性組織The Flipped Learning Network™ (FlippedLearning.org) 提供教師執行翻轉學習所需要的資源。喬恩還擔任TED Education的諮議委員會顧問以及“The Flip Side”的主持人，這一個廣播節目（在iTunes可播放），播放翻轉教育工作者故事。他是三個孩子的父親，與一生的摯愛有著幸福的婚姻。



亞倫薩姆斯自2000年以來一直是教育工作者，他是目前FlippedClass.com的管理總監，也是The Flipped Learning Network的共同創始人，以及聖文森特學院的兼職教授。於2009年他獲得了數學和科學教學卓越的總統獎，並在羅拉多州的Woodland Park, CO和加州的Hacienda Heights擔任化學老師。亞倫還擔任科羅拉多州立科學標準修訂委員會的共同主席以及TED-Ed的顧問。他與喬恩伯格曼合著“***Flip Your Classroom: Reach Every Student in Every Class Every Day***”及“***Flipped Learning: Gateway to Student Engagement***”。他經常演講和主辦screencasts的教育用途和翻轉教室理念的研討會。他主張探詢導向及以學生為中心的學習環境，學生在這樣的學習環境中被鼓勵以有意義的方式展示他們的理解。隨著在公立、私立和自己的學校進行面對面及線上的混成式學習環境的經驗，亞倫為每一位聽眾帶來了獨特的教育視角。他是一個終身學習者、讀卡者，製造者和探險家。他是從Biola University取得生物化學學士學位和教育碩士學位。

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The Flipped Classroom

DURING



Students practice applying key concepts with feedback

IN CLASS

GOAL

GOAL

GOAL

Students prepare to participate in class activities

BEFORE



AFTER



Students check their understanding and extend their learning





OUT OF CLASS

<https://facultyinnovate.utexas.edu/flipped-classroom>

教室在翻轉之後有何不同？

	舊 (翻轉前)	新 (翻轉後)
		
上課前	學生被指定閱讀讀物	學生依課程模組指引提出及收集問題
	教師準備授課	教師為學生準備學習機會
開始上課	學生僅有有限資訊期待學到什麼	學生思維中已有特定問題指引他們的學習
	教師以籠統的假設思考什麼會有助益	教師可以預知學生於何處最需要幫助
上課後	學生嘗試一路追隨	學生執行他們期待學習的技巧
	教師嘗試教完所有講授內容	教師以回饋和簡短講授引領學習過程

教室在翻轉之後有何不同？

	<p>舊 (翻轉前)</p> 	<p>新 (翻轉後)</p> 
上課後	<p>學生做功課 通常延遲回饋</p>	<p>在澄清和回饋之後 學生繼續應用 知識技能</p>
	<p>教師批閱學生 先前寫的功課</p>	<p>教師於需要時可上傳 更多解說和資源及 評閱更高素質的功課</p>
辦公時間	<p>學生想確認 要學習什麼</p>	<p>學生學會到他們所需 的學習資源尋求協助</p>
	<p>教師常重複 授課的內容</p>	<p>教師繼續引導學生 作更深入的了解</p>

我們感謝Sacha Kopp醫師對本表提供卓見。

THINGS YOU SHOULD KNOW ABOUT...™

FLIPPED CLASSROOMS

- 1 What is it?**

The flipped classroom is a pedagogical model in which the typical lecture and homework elements of a course are reversed.
- 2 How does it work?**

There is no single model for the flipped classroom—the term is widely used to describe almost any class structure that provides prerecorded lectures followed by in-class exercises.
- 3 Who's doing it?**

A growing number of higher education individual faculty have begun using the flipped model in their courses.
- 4 Why is it significant?**

Devoting class time to application of concepts might give instructors a better opportunity to detect errors in thinking.
- 5 What are the downsides?**

The flipped classroom is an easy model to get wrong. Although the idea is straightforward, an effective flip requires careful preparation.
- 6 Where is it going?**

As the flipped class becomes more popular, new tools may emerge to support the out-of-class portion of the curriculum.
- 7 What are the implications for teaching and learning?**

The flipped model puts more of the responsibility for learning on the shoulders of students while giving them greater impetus to experiment.

1. What is it?

- ❑ The flipped classroom is a pedagogical model in which the typical lecture and homework elements of a course are reversed.
- ❑ 翻轉教室是一種教學模式，它把課程中的傳統講授和家庭作業翻轉過來

2. How does it work?

- ❑ There is no single model for the flipped classroom—the term is widely used to describe almost any class structure that provides prerecorded lectures followed by in-class exercises.
- ❑ 翻轉教室沒有單一的模式—此名詞廣泛地被用來描述任何先提供事先錄製的授課再在教室中做練習的課程架構

3. Who is doing it?

- ❑ A growing number of higher education individual faculty have begun using the flipped model in their courses.
- ❑ 愈來愈多高等教育者已經開始在他們的課程中使用翻轉模式

4. Why is it significant ?

- ❑ Devoting class time to application of concepts might give instructors a better opportunity to detect errors in thinking.
- ❑ 上課時間用新觀念的應用會給教師一個較好的機會來發現學生思考的錯誤

5. What are the downsides?

- ❑ The flipped classroom is an easy model to get wrong. Although the idea is straightforward, an effective flip requires careful preparation.
- ❑ 翻轉教室是一個容易出的模式，雖然想法是直率的，但有效的翻轉需要小心準備

6. Where is it going?

- ❑ As the flipped class becomes more popular, new tools may emerge to support the out-of-class portion of the curriculum.
- ❑ 因為翻轉教室變得更普及，新的工具便相繼出現用來支持在「教室外」的課程部分

7. What are the implications for teaching and learning ?

- ❑ The flipped model puts more of the responsibility for learning on the shoulders of students while giving them greater impetus to experiment.
- ❑ 在翻轉模式中，給學生較多的動力作實驗時他們得肩負較多的學習責任

Why are instructors flipping their class?

Students learn more deeply. 學生學得更深入

As a result of students taking responsibility, interacting meaningfully and often with their instructor and peers, and getting and giving frequent feedback, they acquire a deeper understanding of the content and how to use it.

Students are more active participants in learning. 學生在學習中更積極參與

The student role shifts from passive recipient to active constructor of knowledge, giving them opportunities to practice using the intellectual tools of the discipline.

Interaction increases and students learn from one another. 互動增加且相互學習

Students work together applying course concepts with guidance from the instructor. This increased interaction helps to create a learning community that encourages them to build knowledge together inside and outside the classroom.

Instructors and students get more feedback. 教師與學生都得到更多回饋

With more opportunities for students to apply their knowledge and therefore demonstrate their ability to use it, gaps in their understanding become visible to both themselves and the instructor.

REFERENCES

Bergmann, J. & Sams, A. (2012). *Flip your classroom: Reach every student in every class every day*. Washington, DC: International Society for Technology in Education.

Berrett, D. (2012, February 19). How flipping the classroom can improve the traditional lecture. *The Chronicle of Higher Education*.

Hake, R.R. (1998). Interactive engagement vs. traditional methods: A six- thousand student survey of mechanics test data for introductory physics courses. *American Journal of Physics*, 66(1): 64-74.



What Is Flipped Learning?

Flipped Learning is a pedagogical approach in which direct instruction moves from the group learning space to the individual learning space, and the resulting group space is transformed into a dynamic, interactive learning environment where the educator guides students as they apply concepts and engage creatively in the subject matter.

翻轉學習是將原在群體學習場所（教室）的直接授課移至個人學習場所（家中）的一種教育學方法。

群體學習場所則被轉換成一個動態、互動的學習環境，在此教師引導學生對學習主題從事有創造力的學習和應用觀念。

Definition of Flipped Learning

Flipped Learning is a pedagogical approach in which direct instruction moves from the group learning space to the individual learning space, and the resulting group space is transformed into a dynamic, interactive learning environment where the educator guides students as they apply concepts and engage creatively in the subject matter.

flipped
learning
network

The Four Pillars of F-L-I-P™

F Flexible Environment

Flipped Learning allows for a variety of learning modes; educators often physically rearrange their learning spaces to accommodate a lesson or unit, to support either group work or independent study. They create flexible spaces in which students choose when and where they learn. Furthermore, educators who flip their classes are flexible in their expectations of student timelines for learning and in their assessments of student learning.

L Learning Culture

In the traditional teacher-centered model, the teacher is the primary source of information. By contrast, the Flipped Learning model deliberately shifts instruction to a learner-centered approach, where in-class time is dedicated to exploring topics in greater depth and creating rich learning opportunities. As a result, students are actively involved in knowledge construction as they participate in and evaluate their learning in a manner that is personally meaningful.

I Intentional Content

Flipped Learning Educators continually think about how they can use the Flipped Learning model to help students develop conceptual understanding, as well as procedural fluency. They determine what they need to teach and what materials students should explore on their own. Educators use Intentional Content to maximize classroom time in order to adopt methods of student-centered, active learning strategies, depending on grade level and subject matter.

P Professional Educator

The role of a Professional Educator is even more important, and often more demanding, in a Flipped Classroom than in a traditional one. During class time, they continually observe their students, providing them with feedback relevant in the moment, and assessing their work. Professional Educators are reflective in their practice, connect with each other to improve their instruction, accept constructive criticism, and tolerate controlled chaos in their classrooms. While Professional Educators take on less visibly prominent roles in a flipped classroom, they remain the essential ingredient that enables Flipped Learning to occur.

The Four Pillars of F-L-I-P™

FLIP 四根柱子
是什麼意思？

The Four Pillars of F-L-I-P™

F Flexible Environment 彈性的環境

Flipped Learning allows for a variety of learning modes; educators often physically rearrange their learning spaces to accommodate a lesson or unit, to support either group work or independent study. They create flexible spaces in which students choose when and where they learn. Furthermore, educators who flip their classes are flexible in their expectations of student timelines for learning and in their assessments of student learning.

F.1	<input type="checkbox"/> I establish spaces and time frames that permit students to interact and reflect on their learning as needed.
F.2	<input type="checkbox"/> I continually observe and monitor students to make adjustments as appropriate.
F.3	<input type="checkbox"/> I provide students with different ways to learn content and demonstrate mastery.

翻轉學習允許多種學習方式；教師為要支持小組工作或獨立學習而經常重新安排足以容納一個班別的學習空間。他們創造靈活的空間，讓學生選擇何時及何地學習。此外，教師依照學生所期待的學習時間及對學生學習的評估來靈活地將班上的活動進行翻轉。

彈性的環境

- ❑ 翻轉學習允許多種學習方式
- ❑ 教師：
 - ❑ 創造靈活的空間
 - ❑ 可讓學生選擇何時及何地學習
 - ❑ 規劃對學生學習的評估

The Four Pillars of F-L-I-P™

L Learning Culture 學習的文化

In the traditional teacher-centered model, the teacher is the primary source of information. By contrast, the Flipped Learning model deliberately shifts instruction to a learner-centered approach, where in-class time is dedicated to exploring topics in greater depth and creating rich learning opportunities. As a result, students are actively involved in knowledge construction as they participate in and evaluate their learning in a manner that is personally meaningful.

L.1 I give students opportunities to engage in meaningful activities without the teacher being central.

L.2 I scaffold these activities and make them accessible to all students through differentiation and feedback.

在傳統的以教師為中心的模式中，教師是信息的主要來源。相比之下，翻轉學習模式故意轉移為學習者為中心的教學方法。在上課的時間，專門深入地探討話題和創建豐富的學習機會。這樣一來，學生們在參與達過程中積極參與知識建構，並有意義地接受針對個人學習的評估。

學習的文化

- ❑ 學習者為中心
- ❑ 深入探討話題
- ❑ 創建學習機會
- ❑ 積極參與知識建構
- ❑ 接受個人學習評估

The Four Pillars of F-L-I-P™

I Intentional Content 刻意的內容

Flipped Learning Educators continually think about how they can use the Flipped Learning model to help students develop conceptual understanding, as well as procedural fluency. They determine what they need to teach and what materials students should explore on their own. Educators use Intentional Content to maximize classroom time in order to adopt methods of student-centered, active learning strategies, depending on grade level and subject matter.

I.1	<input type="checkbox"/> I prioritize concepts used in direct instruction for learners to access on their own.
I.2	<input type="checkbox"/> I create and/or curate relevant content (typically videos) for my students.
I.3	<input type="checkbox"/> I differentiate to make content accessible and relevant to all students.

翻轉學習的教師不斷思考如何可以使用翻轉的學習模式以幫助學生發展概念的理解，以及程序的流暢度。他們決定學生需要被教導什麼及哪些學習內容應由學生自己探索。教師依照年級和題材，使用刻意的內容，儘量提高課堂教學時間是以學生為中心及採主動學習策略。

刻意的內容

- 在課堂的教學時間，教師須致力以學生為中心及促進主動學習
- 教師須不斷思考：
 - 幫助學生理解抽象及困難的概念
 - 設計流暢的程序以促進主動學習

The Four Pillars of F-L-I-P™

P Professional Educator 專業的教師

The role of a Professional Educator is even more important, and often more demanding, in a Flipped Classroom than in a traditional one. During class time, they continually observe their students, providing them with feedback relevant in the moment, and assessing their work. Professional Educators are reflective in their practice, connect with each other to improve their instruction, accept constructive criticism, and tolerate controlled chaos in their classrooms. While Professional Educators take on less visibly prominent roles in a flipped classroom, they remain the essential ingredient that enables Flipped Learning to occur.

P.1	<input type="checkbox"/> I make myself available to all students for individual, small group, and class feedback in real time as needed.
P.2	<input type="checkbox"/> I conduct ongoing formative assessments during class time through observation and by recording data to inform future instruction.
P.3	<input type="checkbox"/> I collaborate and reflect with other educators and take responsibility for transforming my practice.

相較於傳統教室，翻轉教室的專業教師的角色變得更為重要。在上課的時候，他們不斷地觀察自己的學生，為他們提供即時回饋，並評估他們的工作。專業教師在實踐中反思，相互交流以提升他們的教學品質，接受建設性的批評和容忍在教室中受控的混亂。在專業教師在翻轉課堂中承擔不太明顯突出的角色的同時，他們仍然是翻轉學習不可或缺的成員。

專業的教師

- 教師的專業能力變得更為重要
 - 觀察學生學習並提供即時回饋
 - 評估學生的表現
- 提升教學品質
 - 在實踐中反思
 - 與其他教師交流經驗以
 - 接受建設性的批評
 - 容忍教室中「受控的混亂」

報告大綱

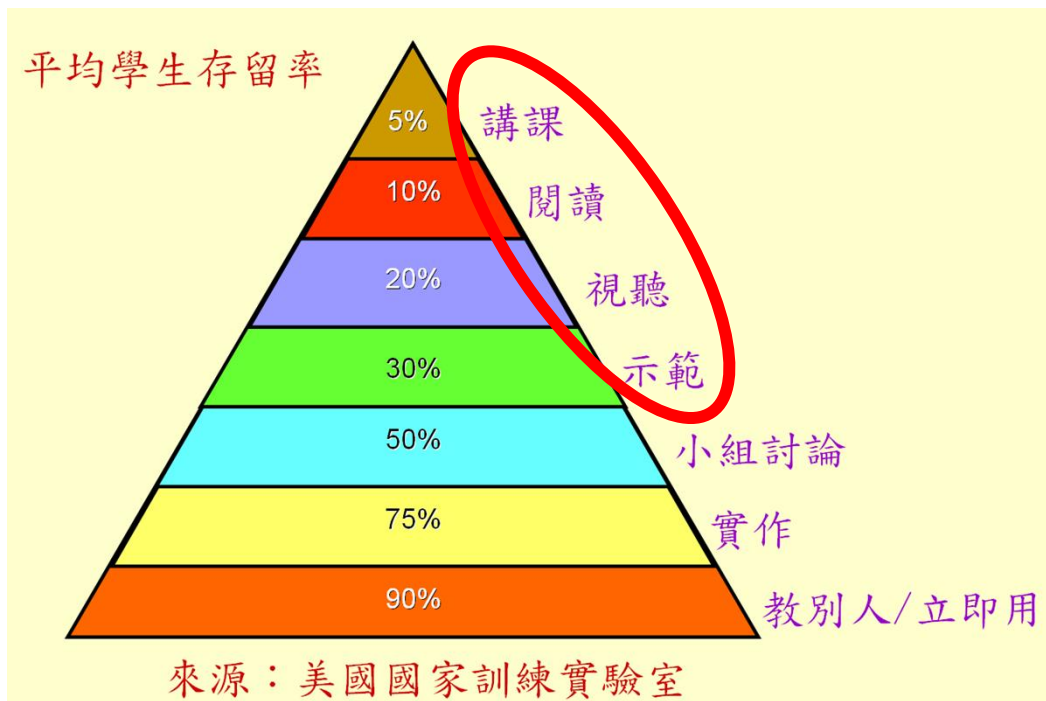
- 前言
- 翻轉教室的發展
- 翻轉教室的理論
- 翻轉教室的執行
- 結語

翻轉教室的執行

- ❑ 個人學習場所（家中）
- ❑ 群體學習場所（教室）

個人學習場所

□ 電腦輔助



[Home](#) / [Featured](#) / The 10 Best Web Tools For Flipped Classrooms

The 10 Best Web Tools For Flipped Classrooms

By JeffDunn on April 6, 2013

1

Wikispaces

Wikispaces

Education

Business

Personal

Already have an account? [Sign in.](#)

**Teachers
work hard.
Give them
software that
isn't hard work.**

A Wikispaces Private Label Education site for your school or district provides the support teachers need to spend more time with their students and less time wrestling with their tools.

Tell me that doesn't sound good.



About The Tool: Wikispaces is a free and useful web tool designed to give students (or ‘users’ of any kind, really) the ability to share their thoughts, reflect on the work of others, and edit a body of work together. It’s a powerful wiki service that is in use around the world.

Using In Flipped Classrooms: Many teachers who wrote into the ol’ Edudemic account say they use Wikispaces to power their classroom blog. In order to do so, the teachers task students with the responsibility of keeping tabs on what their various projects (many use PBL situations too) are doing. Others wrote in saying that they use Wikispaces as a means to pose questions to a flipped classroom where students must determine the answer in an online collaboration space.

Wikispaces has been a solid go-to web tool for many and it’s no surprise it’s being leveraged by flipped classrooms!

Poll Everywhere



Poll Everywhere

Pricing

Take a Tour

Help & FAQ

Signup

Login

Instant Audience Feedback

About The Tool: By far one of the most popular educational web tools available, [Poll Everywhere](#) is being used by classrooms, conferences, and with audiences large and small to get instant feedback. From presentations to keynotes to question-and-answer situations, it's a useful (and free) tool for any classroom.

Using In Flipped Classrooms: The tool makes itself a perfect method for garnering feedback from students, by students. The teacher doesn't even need to be involved. According to what we're hearing from our friends who wrote in, flipped classrooms use Poll Everywhere to enable students to keep track of the learning process among their classmates. Giving students control of the tool has proven to be quite effective.

Edmodo

The image shows the top portion of the Edmodo website. At the top left is the Edmodo logo, which consists of the word "edmodo" in a white, lowercase, sans-serif font inside a blue speech bubble shape. To the right of the logo, in the top right corner of the page, is a "Sign In" link with a right-pointing arrow. Below the logo, the text "Connecting more than" is followed by a large digital counter displaying the number "18615345" in white digits on a dark background. To the right of the counter is the text "teachers and students globally". Below this, the main heading "About Edmodo" is centered in a large, white, sans-serif font. Underneath the heading is a short paragraph in white text: "Edmodo helps connect all learners with the people and resources needed to reach their full potential." The background of the entire page is a blurred image of a young woman with dark hair, smiling and looking towards the right.

About The Tool: [Edmodo](#) may very well be the most-used web tool in education right now. So it's no surprise that it's popular among flipped classrooms. In case you haven't tried it out, Edmodo is a classroom management platform designed to facilitate learning in all directions. By that I mean it lets students ask questions to other students, teacher to student, parent to teacher, etc. You get the idea.

Using In Flipped Classrooms: Students continue discussions online, run polls, and can ask questions of classmates and others. It's easy to see how Edmodo can be used in a classroom where the student controls their own pace of learning. Edmodo provides an always-on learning location that flipped teachers are really embracing.

Screencast

Screencast.com [PRICING](#) [BLOG](#) [Forgot your password?](#) [Help](#) ▼

Give your high-quality videos, images, and documents the perfect online home

By **TechSmith**

Top 3 reasons to use Screencast.com

- ✓ What you upload is what you see
- ✓ You hold the rights to your own content
- ✓ You decide who views your content

Get your free account now
includes 2 GB of storage and 2 GB monthly bandwidth
Need more? [Go Pro](#)

About The Tool: [Screencast](#) may not seem like a prime example of a flipped classroom tool, but it's evidently quite popular. I'd say about 25% of all respondents to a few polls done by myself (not scientific, quite informal) recommended Screencast as one web tool to definitely try out. It lets you make your own (duh) screencasts and then gives you the full license to the product you just created.

Using In Flipped Classrooms: Designed to work with Jing and Camtasia (other popular products by TechSmith), Screencast is great for students looking to learn from each other, record their thoughts and share on a classroom website (see the Edmodo tool above!) or just submit homework by showing how they did something online. Long story short, many teachers say their flipped classrooms use Screencast because it's so simple. Sounds good to me.

Celly



About The Tool: Used by many teachers who wrote in in southeast Asia and parts of Australia, Celly is a hit with schools with limited network reliability and availability. It works by letting groups of people (classrooms, student groups, etc.) create a 'cell' using the app. A cell is a mobile social network that works with any mobile phone or device. Members can join instantly with one text and exchange group messages, polls, reminders, and web alerts.

Using In Flipped Classrooms: Students use [Celly](#) to connect with one another at any time, anywhere. They use the text-based social network to pose questions of each other, direct learning, and even create assignments based on where students want to go in their learning next. Amazing stuff!

Dropbox



About The Tool: [Dropbox](#) enables students, teachers, and parents to work off the same set of information at the same time. It's a popular cloud storage service that is free (for basic version) and lets you have a classroom folder that every student can pull and place data in.

Using In Flipped Classrooms: The big method of implementing Dropbox in flipped classrooms is for homework and exit slips. Assignments can be turned in, handed out, and reports can even be peer reviewed. Exit slips can be safely delivered to parents and teachers by utilizing specific folders that people are 'invited' to. Once invited, you can place any document, link, photo, or other media file in and share it with anyone around the world. So it's great for online learning too!

The screenshot shows the YouTube interface with the search term 'flipped classroom'. The main video player displays a green road sign with the text 'WOODLAND PARK CITY LIMIT ELEV 8465 FT'. The video title is 'The Flipped Classroom'. To the right, there are two advertisements. The first is for 'Inter@CTYX TOPYX' with a 'Free Demo' button. The second is for 'One Trick to Learn Fast' by PimaleurApproach, with 1,901,570 views and a duration of 14:41. Below that is a video thumbnail for 'Flipping is not about videos and technology: Flipped Class Conference' by Learning4Mastery, with 5,772 views and a duration of 52:14, marked as 'FEATURED'.

About The Tool: It's YouTube. C'mon. Okay, you've never heard of it? Seriously? It's an online video site where you can watch just about anything. At last count, a bazillion videos were uploaded every second. Most are not useful for education but many are. They're in the YouTube EDU and a few other related search-based queries. Like, let's say, [flipped classrooms](#)!

Using In Flipped Classrooms: YouTube is being used to help students learn from people like Sal Khan and other YouTube educators to augment and add to their own learning. Many flipped classrooms use YouTube as a means to have students learn at their own pace, on their own time, and with each other. It's a collaborative learning process where the teacher acts more like a 'guide on the side' rather than a 'sage on the stage.'

Twitter

The screenshot shows the Twitter web interface. At the top, there is a navigation bar with icons for Home, Connect, Discover, and Me, along with a search bar and settings. The main content area is divided into two columns. The left column features the profile of 'Edudemic', which includes a profile picture, the name 'Edudemic', a link to 'View my profile page', and statistics: 12,025 TWEETS, 2,814 FOLLOWING, and 41,428 FOLLOWERS. Below the statistics is a text input field for composing a new tweet. The right column displays a list of tweets. The top tweet is from 'The Boston Globe' (@BostonGlobe), posted 4 seconds ago, with the text: 'The title track of Charlie Farren's new album, "Tuesday," was penned by the late Brad Delp of the band #Boston b.globe.com/17fMw6T'. Below this is a tweet from 'General Electric' (@generalelectric), posted 46 minutes ago, with the text: 'Will the universal language of the future be data? Here's a thought from @aweigend: pic.twitter.com/G2caqr8Hgk'. This tweet is promoted by General Electric and followed by Dan Curcio, Dr. Eric Wood, and OnlineMBA.com. There is also a 'View photo' link.

About The Tool: One of the most powerful tools in education, [Twitter](#) is by far the most popular tools among educators. It dwarfs most of the other web tools that teachers are using (aside from YouTube) and lets anyone build their own personalized learning network or professional learning network (PLN).

Using In Flipped Classrooms: Teachers use Twitter to learn about new and exciting learning models, apps, tools (hey that's like this post!), and to connect with others. Students in flipped classrooms are, according to respondents, using Twitter to build out their peer network and endeavoring to work in a more collaborative fashion. This is done mostly using hashtag chats and dedicated classroom Twitter accounts, it seems.

Evernote



PRODUCTS ▾ | BLOGS ▾ | THE TRUNK

- ▶ Web Sign In
- ▶ Create Account
- ▶ Go Premium

If you need to reset your password, click below

 Reset Password

Remember everything.



Capture anything.

Save your ideas, things you like, things you hear, and things you see.



Access anywhere.

Evernote works with nearly every computer, phone and mobile device out there.



Find things fast.

Search by keyword, tag or even printed and handwritten text inside images.

About The Tool: [Evernote](#) is simply a tool that lets you take all your thoughts with you. It's like having an infinitely more powerful memory. Who needs a brain when you have an app or tool like Evernote? All joking aside, it's a useful tool that lets you access your notes and other documents anywhere. Useful for all kinds of teachers and very simple to use.

Using In Flipped Classrooms: Many respondents say they use Evernote as a means to help their students in a 1:1 device environment. Mind you, they're not all 1:1 iPad environments, many emphasized that they have a 1:1 'device' classroom that's flipped. So that could mean anything.

Teaching Channel

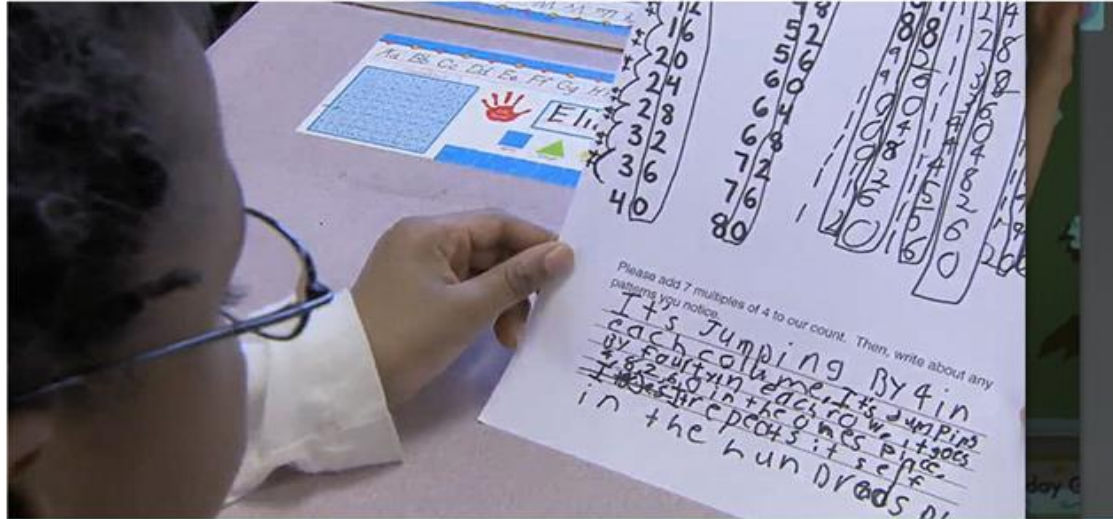


Teaching Channel
Great Teaching. Inspiring Classrooms.

VIDEOS TEACHERS

BETA
Q&A

Search



Teaching Practice

Assess and Plan with Exit Tickets

All Grades
All Subjects
Closure

Do you know
the answer?

Share your experience.

Q&A

See all questions

How to deal w/ parents who
might intimidate you?

4

Thoughts on Teaching Parts
of Novels

4

Roller coaster simulator
program?

2

About The Tool: Teaching Channel is a video showcase—on the Internet and TV—of inspiring and effective teaching practices in America's schools. We have a rapidly growing community of registered members who trade ideas and share inspiration from each other.

Using In Flipped Classrooms: Like YouTube, the videos on Teaching Channel are specifically designed for education and useful for anyone of any age looking to learn more about topics like flipped classrooms. One of the most popular ways of using Teaching Channel in flipped classrooms seems to be students finding their own favorite videos and then trying to make their own similar to the ones they like.



How to flip your classroom



Flipping is easy – and with a little thought and planning, teachers can use the flipped model to create engaging learning experiences for their students. This section covers the nuts and bolts of flipping – from creating videos, to introducing the flipped concept, to practical ideas for using class time differently.

1

Create a video



It all starts with a teacher doing what they do best – explaining a concept. Except this time they’re doing it on video, either by simply explaining a concept on camera, or using screen capture tools or presentation software with a voiceover. Video content retains the connection, the humor, and the pace of great teaching – and there’s plenty of scope for teachers to be creative! The guides below explain how teachers can create video learning content that engages their students, setting the scene for powerful classroom learning experiences.

DOWNLOADABLE PDF GUIDES



Creating effective learning videos

A practical guide to creating the best learning videos



Mobile video capture

Getting the most from your iPhone or iPad for creating flipped learning videos



Ideas for teacher videos School

Five practical ideas for creating flipped videos, for K-12 teachers



Ideas for professor videos Higher Ed

Five practical ideas for creating flipped videos, for higher ed professors

2 Share it with students



Students then watch the content at home, before class. This gives them freedom over how, when and where they learn – and it lets them engage with the video content in the way that suits them best. They can watch alone, with friends, or with parents – and on any device they choose, from their iPhone to their home computer. They can pause, rewind and re-watch and read around the topic. Students then come to class prepared with knowledge, questions, observations and ideas that will underpin the learning in the next stage.

DOWNLOADABLE PDF GUIDES



Tips for introducing topics School

Introducing the flipped concept to K-12 students and achieving their buy-in.



Tips for introducing topics Higher Ed

Introducing the flipped concept to Higher Ed students and achieving their buy-in.



Safely sharing video content

Simple ways to share video content with your students in a safe and controlled way

3 Spend class time differently



Because the students have watched the video content at home, class time can now be spent applying that knowledge in engaging, practical, collaborative ways. The teacher is freed up to craft personalized learning experiences for students according to their needs, and to circulate the class helping students individually or in small groups. Less “sit and listen” equals more “do and learn” – and the flipped model is making class time more enjoyable, productive and engaging for students and teachers across the world.

DOWNLOADABLE PDF GUIDES



Using class time differently School

How K-12 teachers can use class time once they have flipped the learning



Using class time differently Higher Ed

How higher ed professors can use class time once they have flipped the learning



Practical considerations School

Explores the common “sticking points” of using class time differently



Practical considerations Higher Ed

Explores the common “sticking points” of using class time differently

翻轉教室的執行

- 個人學習場所（家中）
- 群體學習場所（教室）

Using Class Time Differently



Project-based learning

計畫導向學習

Collaborative group projects

團隊合作計畫

Practical tasks

實際任務

Student-created content

學生創造內容

Personalized Learning

個人化學習

Reflecting on Learning

學習的反思

Teacher Circulation

教師輪換

Flipped Tips

翻轉小提示

計畫導向學習

- ❑ 當學生自己能參與計畫的擬訂時最具效力
- ❑ 以經濟學為例，學生可依據每週從教師製作的影片中闡述的商業觀念來一起開創事業
- ❑ 以科學為例，學生可自行設計及執行實驗來測試影片中闡述的觀念
- ❑ 將學生安排於學習旅程中，他們會相互支持、發現及發展新技巧、完全擁有自己的創造和學習

團隊合作計畫

- ❑ 學生有定期的機會一起工作來解決問題及分享學習心得
- ❑ 特別適合為計畫導向學習的一部分

實際任務

- 以「創造」、「展示」、「做事」提升學習成效
- 以「創造出實務經驗」為目的
- 讓學生：
 - 選擇不同活動
 - 輪流參與不同活動
 - 自己設計活動

學生創造內容

- ❑ 從學生的作業呈現「學習成效」
- ❑ 可讓學生選擇使用的媒體——他們常會帶回很好的內容而增進他們的學習
- ❑ 分組進行——常會有同儕教導
- ❑ 製作的成品（影片）可作為其他學生的部分翻轉教材——加強助人學習的真實榮譽感

個人化學習

- ❑ 教師可利用翻轉學習模式依學生獨特的需求、能力和興趣來創造個人化學習經驗
- ❑ 翻轉學習就是要打破“一種尺寸適合所有需求”的教學
- ❑ 教師最清楚學生，故應因他們個別需求而用不同的教學方法
- ❑ 看到翻轉教室，你會看到學生在小組中執行計畫，有些學生寫報告、有些則在製作影片，是一個充滿興奮、投入而活在學習中的教室

學習的反思

- ❑ 反思的學習者 = 最有效的學習者
- ❑ 給學生**定期的機會**反思自己的「學習」和「了解觀念」
- ❑ 教師應常使用「有效的提問」來支持，並從師生與學生們之間的討論中學習
- ❑ 學生可保留自己的「反思日記」或部落格，在每次下課時，他們可更新內容，以呈現「學到什麼」或「下一次上課需注意什麼」
- ❑ 學生也可在他們部落格或日記中記下他們觀看翻轉影片時發現的問題或觀察

教師輪換

- ❑ 翻轉學習模式使教師在教室中的時間更具彈性，各項教學活動需有大量的教師投入和輪換
- ❑ 許多教師開始時對輪換有些陌生——在計畫導向學習時，會對引導學生依預訂路線學習作“鬆綁”會有些陌生感

翻轉小提示

- ❑ 在學習活動中建立一組‘need to know’元素，有助於學習到影片中的內容
- ❑ 學生須負責看影片及備課，學到多少視乎準備多少
- ❑ 特別是在團隊合作計畫的功課——沒有準備的學生會拉倒整個團隊

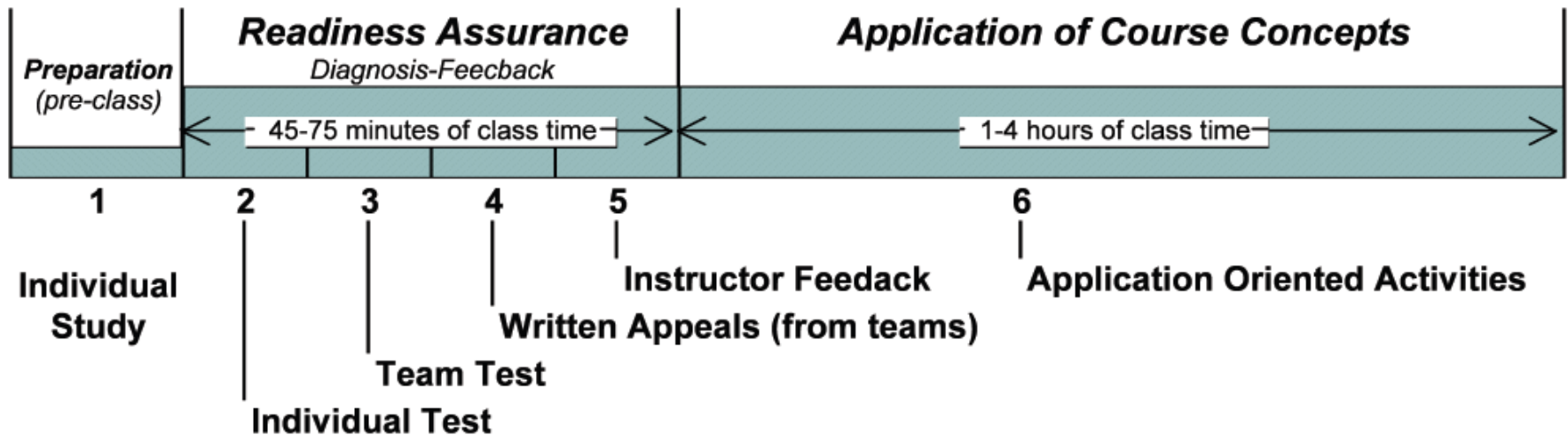
有沒有一個具體的
翻轉教室教學方式呢？

團隊導向學習 (Team-based Learning)

- ❑ 混成式學習
- ❑ 翻轉學習
- ❑ 團隊
- ❑ 工課前評估：個人 vs. 團隊能力
- ❑ 簡單、愚蠢，但有效
- ❑ 反思及回饋：必要成分

Team-Based Learning Instructional Activity Sequence

(Repeated for each major instructional unit, i.e., 5-7 per course)



報告大綱

- 前言
- 翻轉教室的發展
- 翻轉教室的理論
- 翻轉教室的執行
- 結語

翻轉教室

- ❑ 簡單把戲
- ❑ 原則未改
- ❑ 電腦加持
- ❑ 教技本位

課程設計—5有

- ❑ 有關：學習目標是否符合學員背景？
- ❑ 有用：達成這些目標對學員有什麼幫助？
- ❑ 有效：保證能學到多少？
- ❑ 有趣：過程中有什麼是有趣的？
- ❑ 有參與：有什麼互動的過程？

課程設計——翻轉教室

- 前段學習（校外個人自習）
- 後段學習（校內小組學習）

翻轉教室前段學習（校外個人自習）

- ❑ 有關：學員背景、與後段學習有什麼相關？
- ❑ 有用：達成這些目標對後段學習有什麼幫助？
- ❑ 有效：保證能學到多少可有助於後段學習？
- ❑ 有趣：過程中有什麼是有趣的？
- ❑ 有參與：有什麼互動的過程？

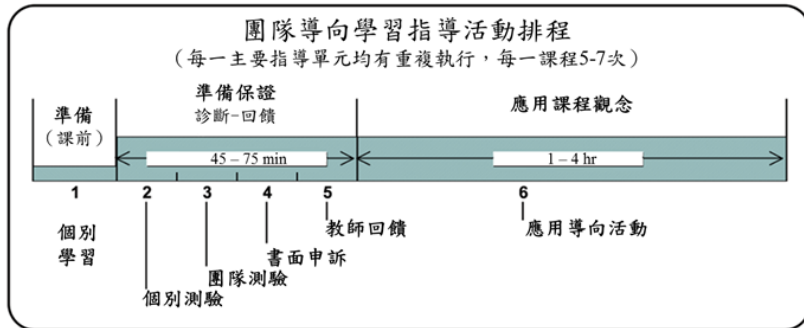
翻轉教室後段學習（校內小組學習）

- ❑ 有關：與前段學習有什麼相關？
- ❑ 有用：達成這些目標對學員有什麼幫助？
- ❑ 有效：保證能學到多少？
- ❑ 有趣：過程中有什麼是有趣的？
- ❑ 有參與：有什麼互動的過程？

團隊導向學習大綱

一、學習目的 (Goals)

二、課程架構



三、前段學習 (校外個人自習)

1. 學習目標

- (1)
- (2)
- (3)

2. 學習方式

- (1)
- (2)
- (3)

3. 教學技巧

- (1)
- (2)
- (3)

4. 評估方式

學習目標	評估方式	備註

四、後段學習 (校內小組學習)

1. 學習目標

- (1)
- (2)
- (3)

2. 學習方式

- (1)
- (2)
- (3)

3. 教學技巧

- (1)
- (2)
- (3)

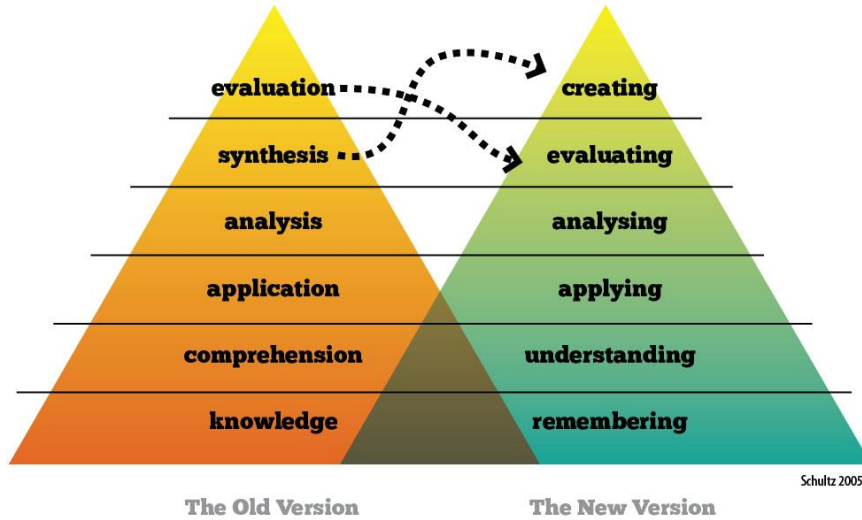
4. 評估方式

學習目標	評估方式	備註

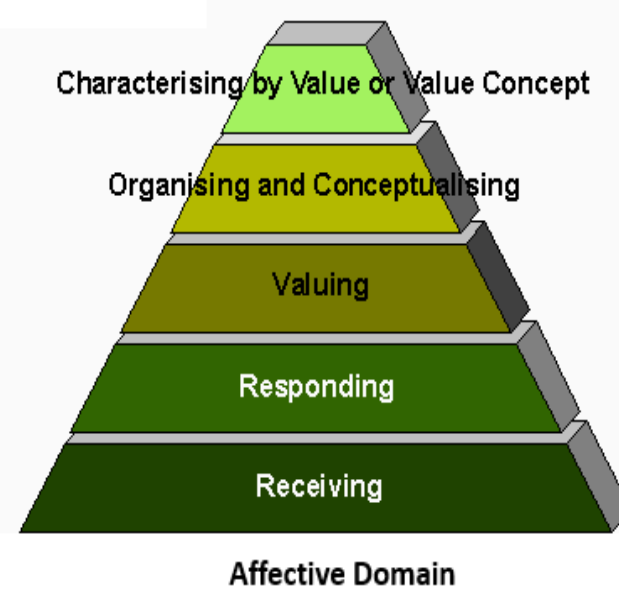
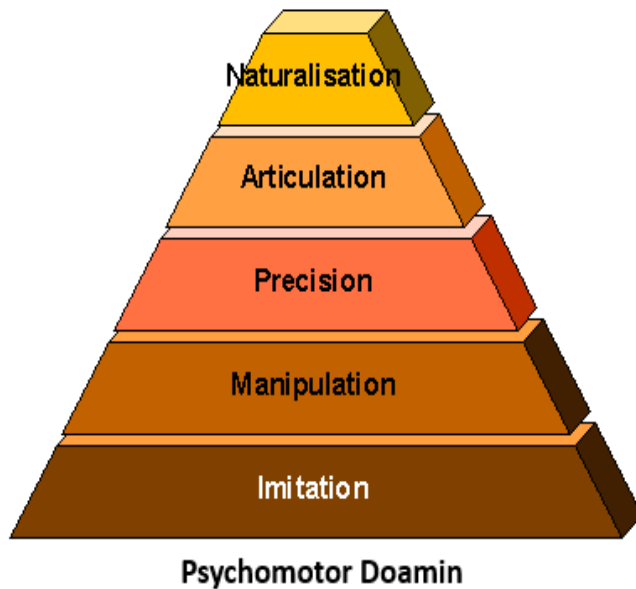
五、預期困難、限制及處理方法

六、教科書、教材及參考資料

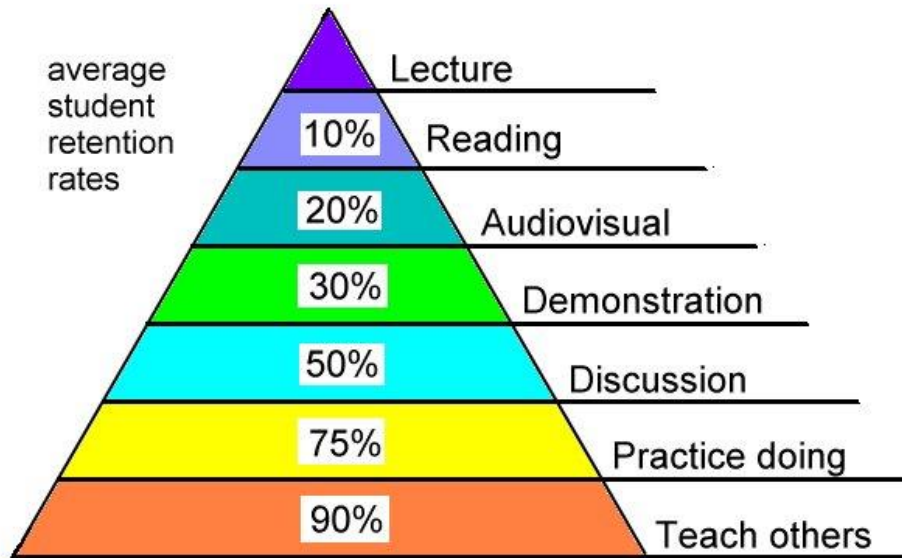
學習目標：



Creating	Designing, constructing, planning, producing, inventing, devising, making, programming, filming, animating, blogging, mixing, re-mixing, wiki-ing, publishing, videocasting, podcasting, directing, broadcasting
Evaluating	Checking, hypothesizing, critiquing, experimenting, judging texting, detecting, monitoring, blog commenting, reviewing, posting, moderating, collaborating, networking, refactoring, testing
Analyzing	Comparing, organizing, deconstructing, attributing, outlining, finding, structuring, integrating, mashing, linking, validating, reverse engineering, cracking, media clipping
Applying	Implementing, carrying out, using, executing, running, loading, playing, operating, hacking, uploading, sharing, editing
Understanding	Interpreting, Summarizing, Inferring, paraphrasing, classifying, comparing, explaining, exemplifying, advanced searches, Boolean searches, blog journaling, twittering, categorizing, tagging, commenting, annotating, subscribing
Remembering	Recognizing, listing, describing, identifying retrieving, naming, locating, finding, bullet pointing, highlighting, bookmarking, social networking, social bookmarking, favoriting, local bookmarking, searching, googling



Learning Pyramid



Source: National Training Laboratories, Bethel, Maine

學習方式：

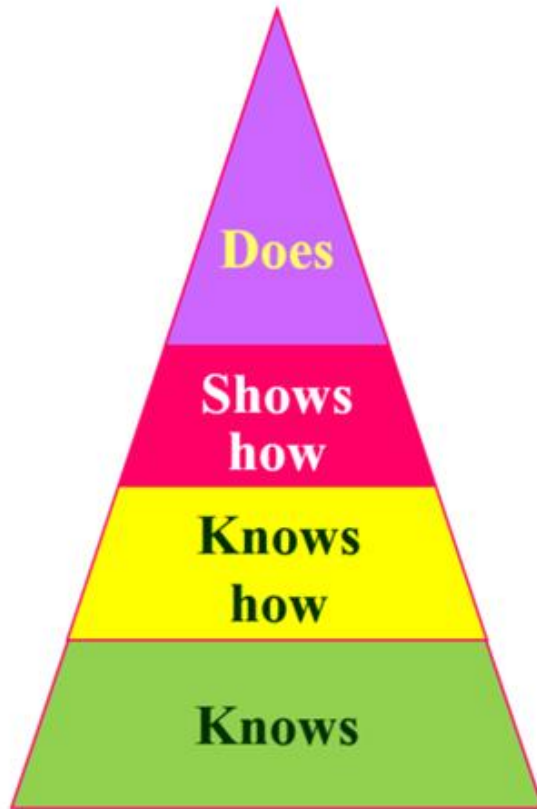
1. 聽講：講授、錄音
2. 閱讀：紙本資料、電子資料
3. 視聽：影片呈現情景
4. 示範：現場操作、影片示範
5. 小組討論：PBL、world cafe
6. 實作：SP、角色扮演、VR、模擬人
7. 立即用/教別人：實地操作、教學

教學技巧（促進明白&記憶）：

1. 資訊目視化（information visualization）：白板（高架式投影機）上繪圖、影片、卡通、漫畫
2. 使用例子、典故、比喻
3. 提問：有計畫的重複、探索性提問、分散性問題、採用較高層次的問題、蘇格拉底教學法
4. 刺激變化（Stimulus variation）：電子遊戲、趣味謎語、歌唱遊戲
5. 提問與回饋法：一分鐘教師
6. 多元教學法：3D + RFR
7. 潛移默化法
8. Think-Pair-Share
9. Critical reflection

評估方式：

對學生的評估



Miller GE, *Acad Med* 1990.
(米勒金字塔)

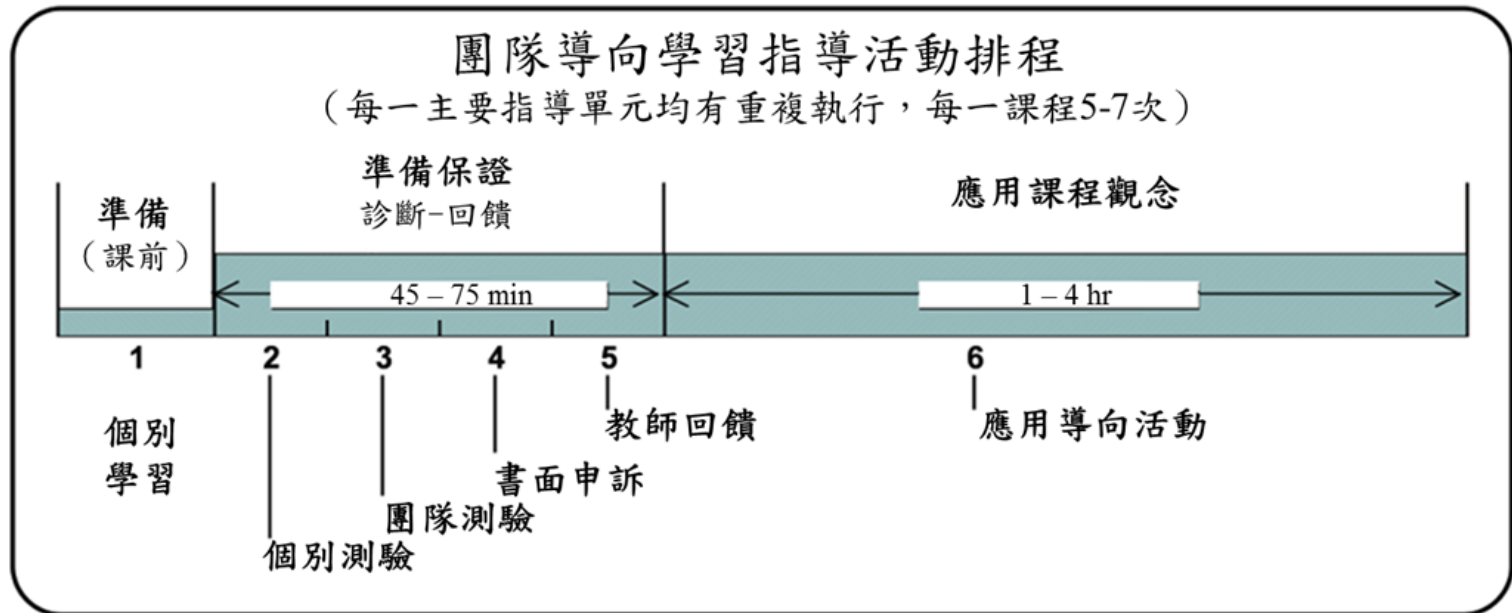
- 學生檔案
- 病歷紀錄
- 學習護照
- 多源回饋
- **Mini-CEX, DOPS**
- **OSCE**
- 病例報告、申論題
- 口試、Case-based discussion
- 簡答題、填充題
- 選擇題、是非題

回饋技巧團隊導向學習大綱

一、學習目的 (Goals)

能對學生作出合宜的回饋

二、課程架構



三、前段學習（校外個人自習）

1. 學習目標

- (1) 了解回饋的原理和概念
- (2) 能辨別好的與壞的回饋
- (3) 能說出兩觀念和三絕招

2. 學習方式

- (1) 聽講：PowerCam 介紹回饋的原理和概念
- (2) 視聽：影片學習：觀看並回答問題

3. 教學技巧

- (1) 使用例子、典故、比喻
- (2) 提問：有計畫的重複、探索性提問、分散性問題、採用較高層次的問題
- (3) 刺激變化（Stimulus variation）

4. 評估方式

學習目標	評估方式	備註
了解回饋的原理和概念	問答題	網路測驗
能辨別好與壞的回饋	問答題	網路測驗
能說出兩觀念和三絕招	問答題	網路測驗

四、後段學習（校內小組學習）

1. 學習目標

- (1) 能討論好的與壞的回饋
- (2) 能注意兩觀念
- (3) 能演出三絕招

2. 學習方式

- (1) 小組討論：影片討論及報告、演練的反思與回饋
- (2) 實作/身歷其境：撰寫劇本與角色扮演

3. 教學技巧

- (1) 使用例子
- (2) 多元教學法：3D + RFR

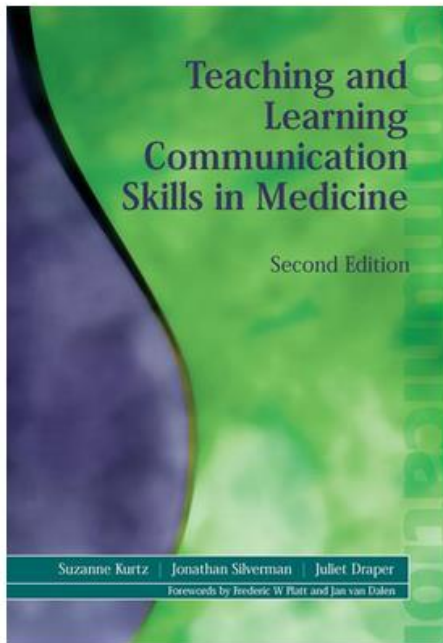
4. 評估方式

學習目標	評估方式	備註
能討論好的與壞的回饋	Formative OSCE	當站考完立即討論
能注意兩觀念	OSCE	
能演出三絕招	OSCE	

五、預期困難、限制及處理方法

1. 影片拍攝的經驗與技巧不足，擬拜託公傳協助。
2. 學員可能不會先行上網學習，擬加強宣導溝通。
3. 學員可能不太擅長於寫劇本，擬加強撰寫指引。

六、教科書、教材及參考資料





謝謝聆聽 敬請賜教

人生如黑夜中直衝雲霄的焰火，此起彼落，任誰也照不亮永恆的一刻；

在浩瀚的宇宙之中，除了沒有智慧的人，誰敢不謙卑？

cychanfly@gmail.com