

國立中央大學100-2 學期

國立中央大學 教學發展中心

Problem-Based Learning

如何用好奇心和資訊力快樂的 培養專業英文能力

—學習發現之旅於焉展開

Date: 101年5月10日

Time: 10:00~12:00

張幼珍 副教授

元智大學化材系

Yuan Ze University

元智大學 ● 卓越教學

老師的教學理念

人人都有自己獨特的
主導天賦！

老師要用心發掘學生潛能，時時鼓勵學生！

GOALS

- 學習應該是快樂的—教學生怎麼玩
- 學習應該是主動的—引導他們主動求知
- 讓學生的好奇心復活—讓學生follow自己好奇心去找答案
- 人都希望被關愛、信任、稱讚和尊重—用同理心對待學生
- 學校是培養職場多元核心能力的前哨站
- 無論如何，用心設法培養學生多元核心能力、技巧與態度
- 一代一定要超越一代，我責無旁貸
- 學生是接棒者—老師的成敗在於是否將他們準備好
- 人生無常，有用的、好的不要獨享，分享給學生和下一代人，對這個世界，才算有點貢獻、不枉此生。
- 我們很強，學生很弱；我們真的那麼強的話，就證明可以把學生變得很強！

利用我的五個教育天賦在教學上

- **統率**：孩子王、主導班上學習氣氛、提供學習動機、信任、稱讚
- **戰略**：嘗試各種方法來解決教學與學習問題、
如何讓學生在課堂上提問、大方加分、
讓學生願意進行難度高的學習活動、學習活動小組化、
遊戲化、競賽化
- **理念**：設計「讀書五到」與「六種記憶策略」互動的**創意教學活動**
- **分析**：分析教學方法的優劣、分析教與學的問題、
分析學生特質與喜好、將傳統課程轉成「問題導向」內容、
分享個人分析問題的方法、**相信因果**
- **學習**：不斷找尋新的教學方法、PBL, Peer Instruction (Mazur)
(哈佛物理)、**Brain-based Learning**, etc.



瞭解蓋洛普34個教育天賦，對我們工作和生活幫助都會有很大的助益！

元智大學化材系學生蓋洛普34個主導天賦分佈比例與天賦特質

No.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.
天賦	成就	行動	適應	分析	統籌	信仰	統帥	溝通	競爭	關聯	回顧	謹慎	伯樂	紀律	體諒	公平	專注
%	11	6	46	7	9	4	3	10	9	3	10	12	16	2	29	9	10

No.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.	32.	33.	34.
天賦	前瞻	和諧	理念	包容	個別	蒐集	思維	學習	完美	積極	交往	責任	排難	自信	追求	戰略	取悅
%	4	25	16	14	26	15	6	12	13	37	16	21	32	8	9	21	15

※量化的目標：蓋洛普測驗學生人數 130 位 (實測 117 位)。

※質化的目標：藉發展 30 年的蓋洛普主導天賦測驗來作因材施教的 PBL 教學；

※實際效益：

1. 分析主導天賦組合發現，本系大一學生整體天賦百分比由高而低分析如后：全年級 1/2 同學適應力強、工作配合度高、樂於助人成長(個別+伯樂)；1/3 樂觀積極、擁抱問題(排難)；1/4 重視人際和諧、具同理心(體諒)；1/5 做事有責任感、做事講究方法(戰略)；1/6 具創新天賦。
2. 根據 34 種天賦屬性分三大類-具備統帥統籌天賦的領導、具備參謀天賦的參謀總長、以及具備溝通天賦的外交官。藉以上將全班同學分成三大類，每一學生小組都有組長、參謀、外交官各一位。
3. PBL 課程採小組競賽並以發言次數最多的小組可得最高平時成績，B1 班最高分小組有兩位同學具備競爭天賦，三位同學都樂於幫助彼此成長(個別)。F1 班最高分小組則是由具備成就、完美、專注、自信、個別等天賦的三位成員組成。定性上也發現課堂互動發言者，多為各組外交官。

學期初第一週:讓學生相信我真心希望他們超越我們!學會我分享的學習方法、能力、態度

Pre-battle Speech by Maximus

「統率」上課班級

WHAT WE DO IN LIFE ECHOES IN ETERNITY.

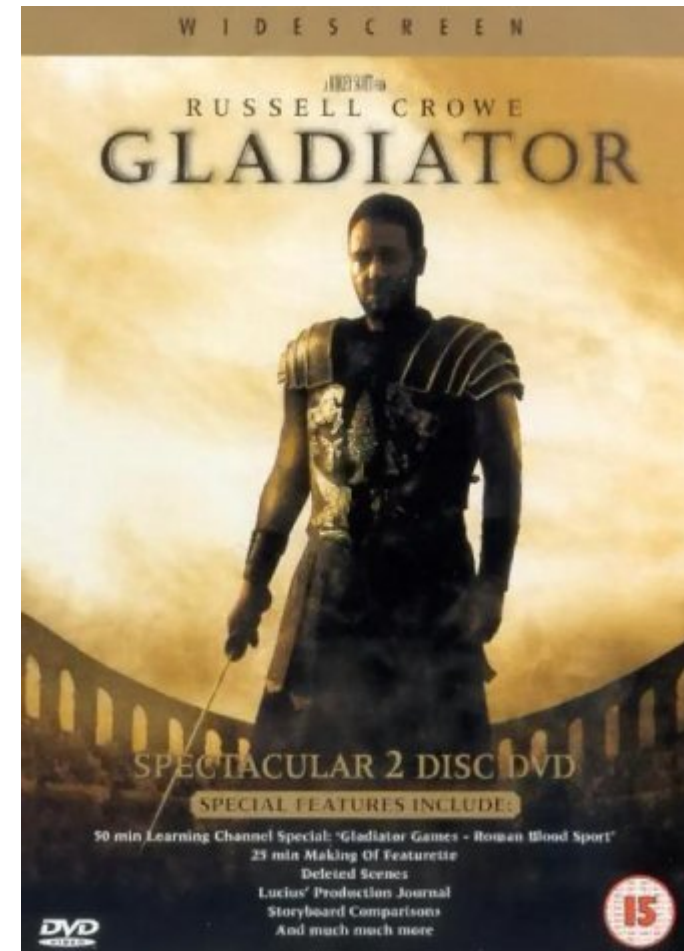
提供學習動機

神鬼戰士的啟發

Expectation for The Future:

Three weeks from now, I will be harvesting my crops. Imagine where you will be, and it will be so. Hold the line! Stay with me! If you find yourself alone, riding in the green fields with the sun on your face, do not be troubled. For you are in Elysium*, and you're already dead!

註：The Elysian Fields, or the Elysian Plains, were the final resting places of the souls of the heroic and the honorable.



TEACH ME AND I
FORGET.

TEACH ME AND I
REMEMBER.

INVOLVE ME AND I
LEARN.

-- *BENJAMIN FRANKLIN*

「統率」上課班級

學習快樂嗎？

化材系大一必修一學期實用科技英文的讀、聽、說

[元智上課影片介紹]

元智EL222上課影片播放一

如果學習很快樂，誰不喜歡學習？

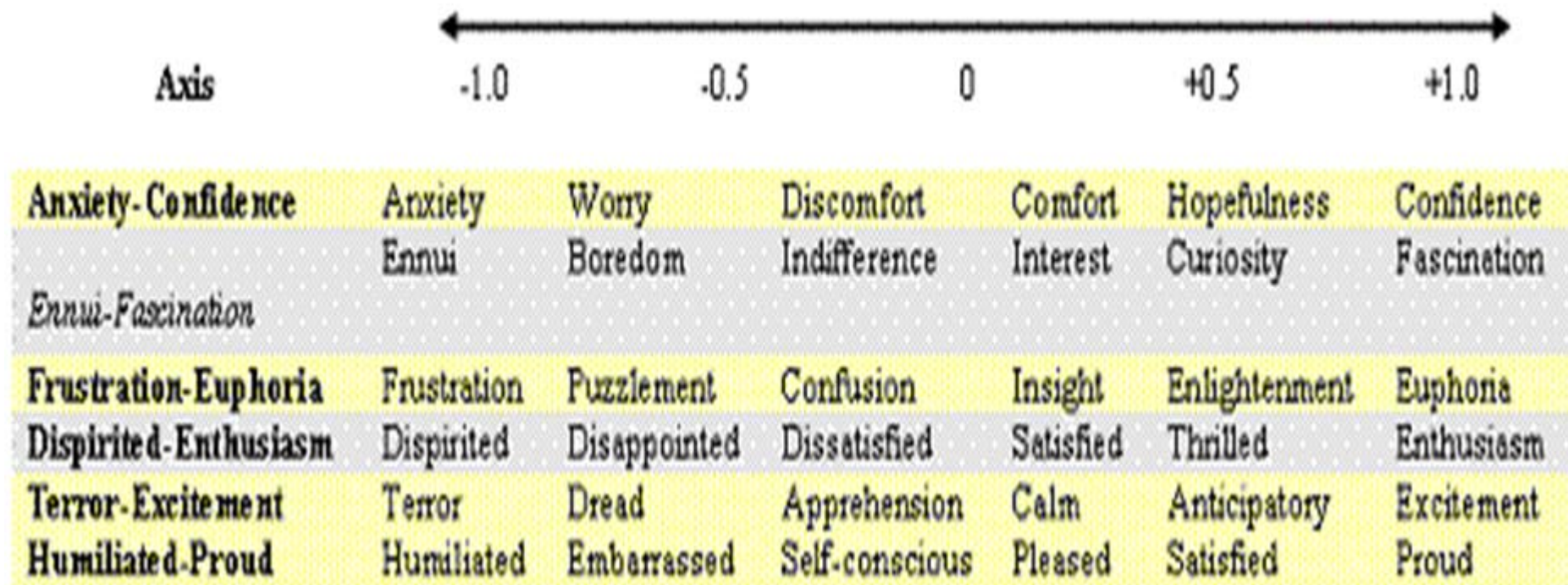
學習是天性！

學習過程
應該是
自然且心靈愉悅的！

情緒影響學習！

HOW EMOTION AFFECTS LEARNING?

The emotions listed on the continuum can either affect learning in a positive (+) or negative (-) way.



學習應該是快樂的！

只加分不扣分的學習

針對學生自學能力設計學習活動

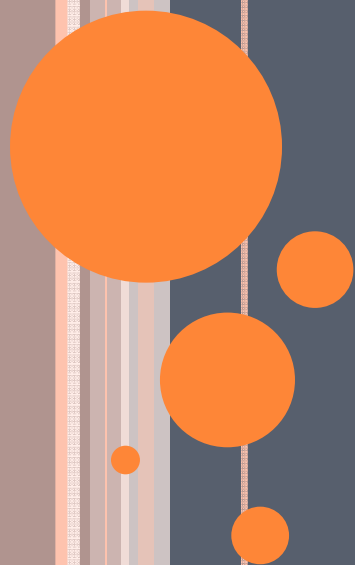
主動、專注、自己解決問題的小組學習

自學能力明顯成長且受老師肯定讚賞的學習

用心

什麼都學得會！

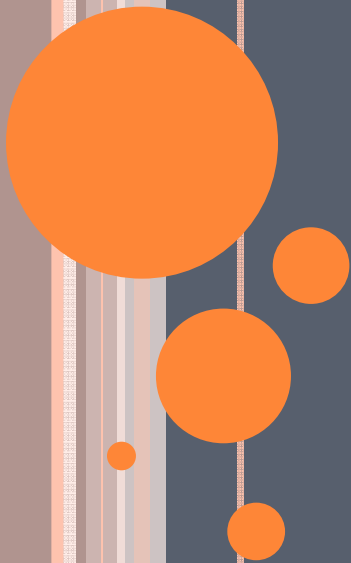
每個人都要學習如何用心做事！



課堂裡

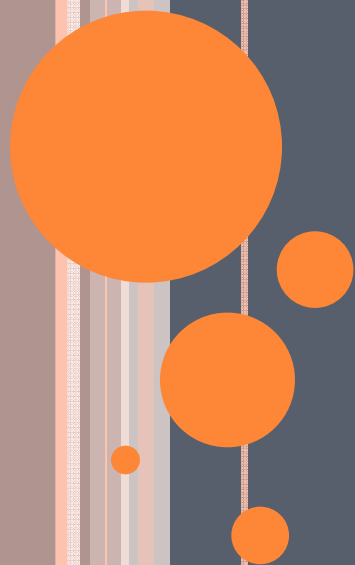
學生是[台上]主角

老師是[台下]教練



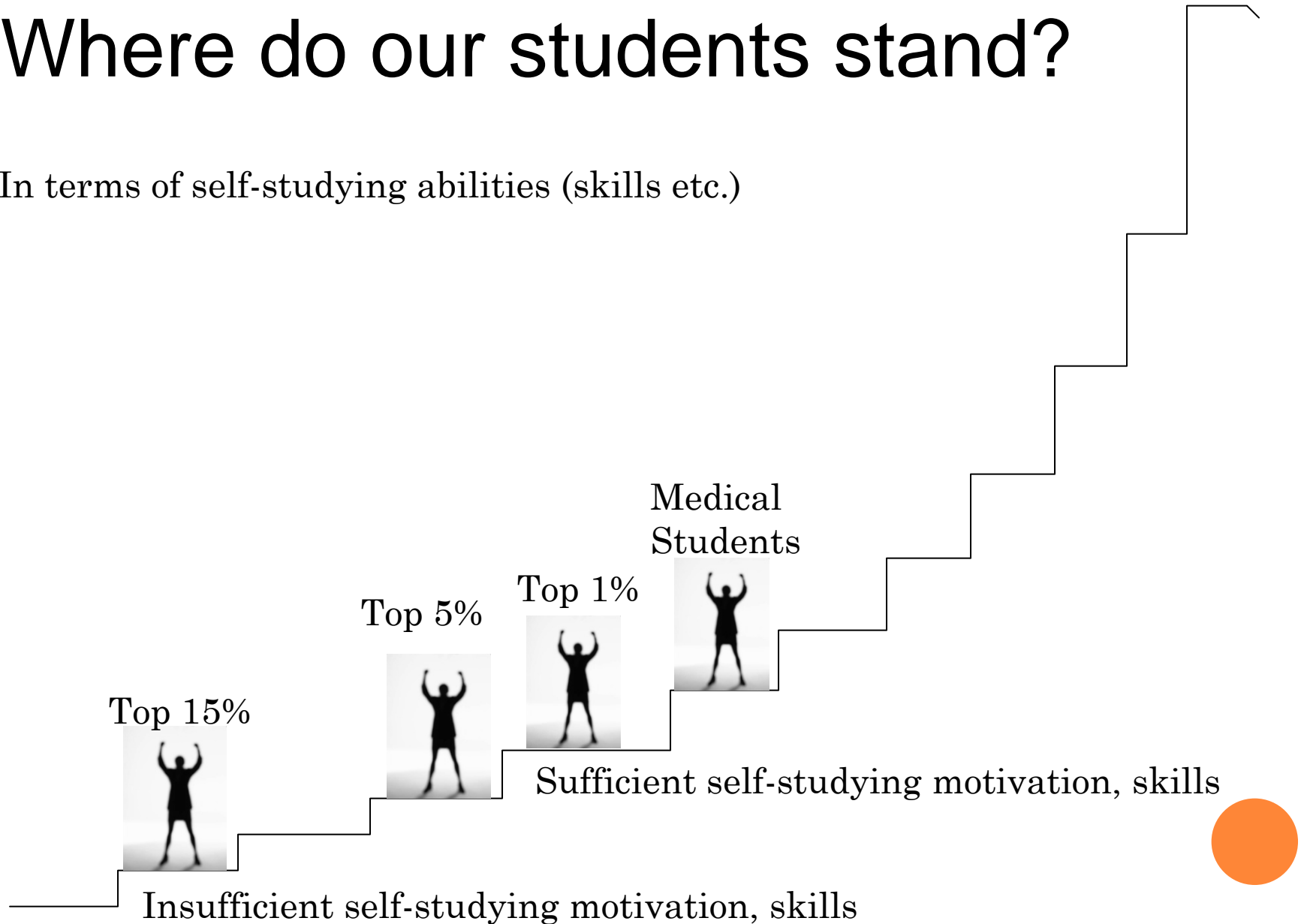
學生是
[引導我如何教學]
的良師

沒有
[學生盛情襄助]
我是不會教學的



Where do our students stand?

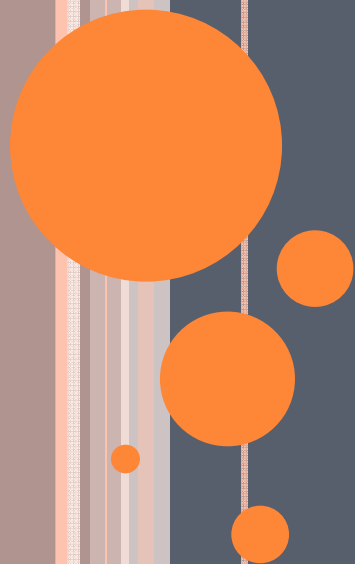
In terms of self-studying abilities (skills etc.)



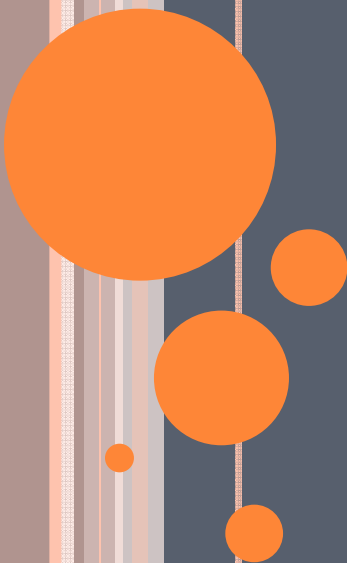
教與學 如接力賽交棒 瞬間心靈的神交

信任、希望
施予、愛人

缺一不可



牛頓第三運動定律：
一個作用力必有一個大小
相等、方向相反的作用力！



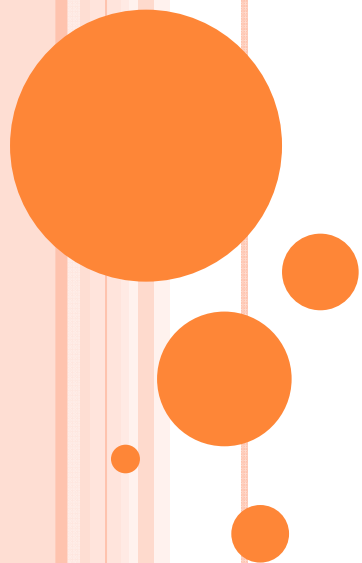
同理，對教學挹注專注與
熱情的教師，必能喚起學
子的專助的學習熱情！

儘管只有
小嬰兒學步般
一小步的進步

也可以帶給教師
無限的歡喜！

小嬰兒學走路的时间不一樣

如果它還不會爬
別急著讓它學走
要先從爬開始教
但不要讓它一輩子依賴你





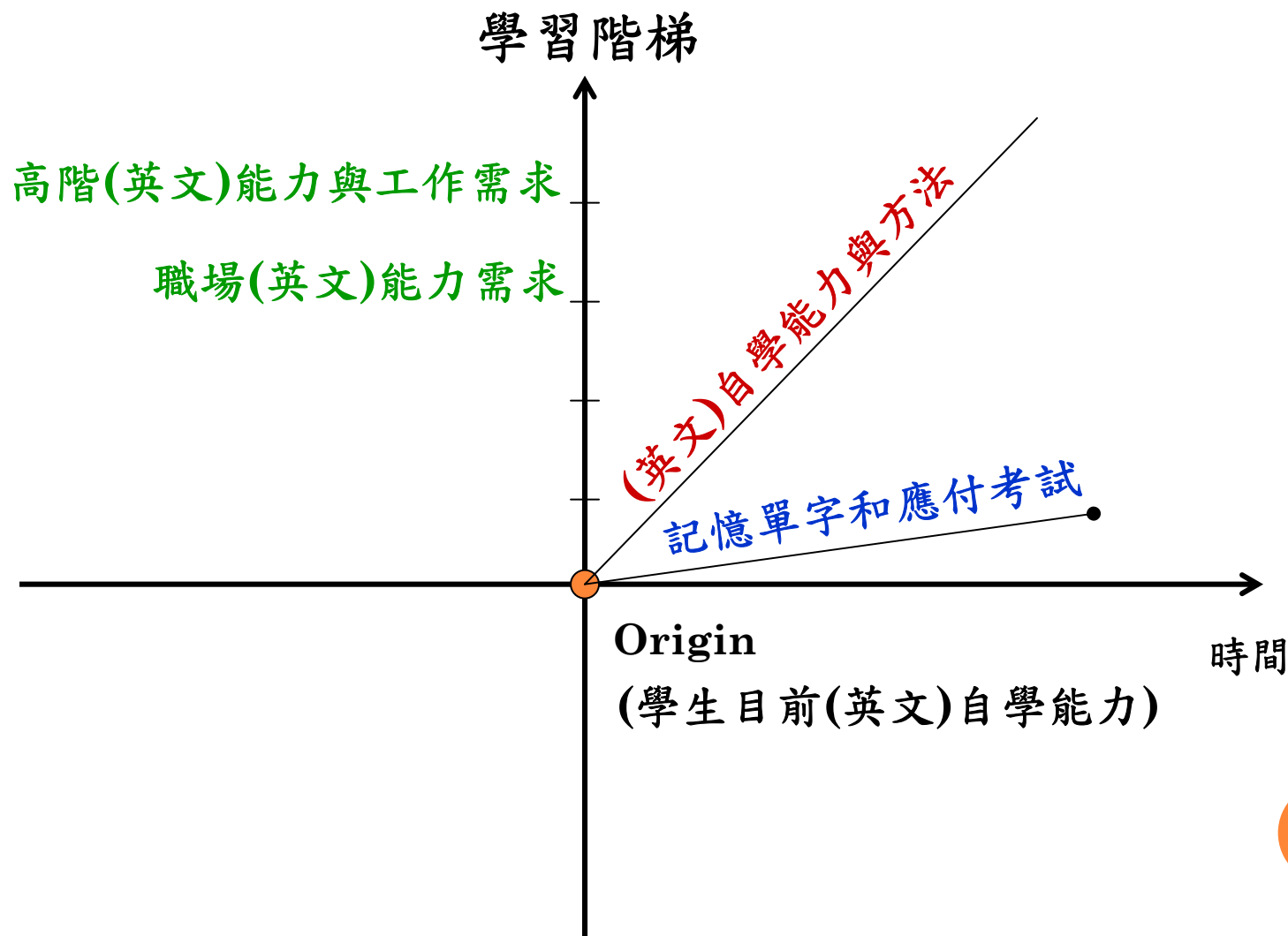
A TEACHER IS ONE WHO MAKES
HIMSELF PROGRESSIVELY
UNNECESSARY.

~Thomas Carruthers

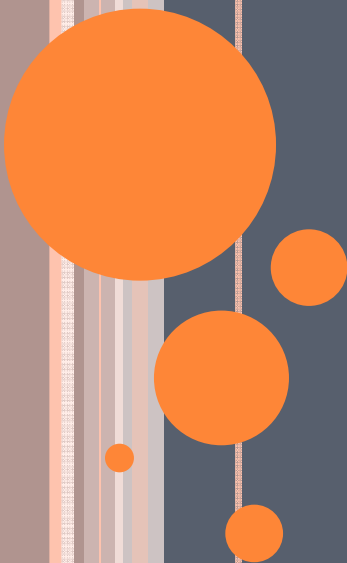
除了經濟獨立

讓學生學習到自學能力
讓學生早日「學習獨立」

從我們自己的(英語)能力學習經驗裡可知



教師對教學過程須
非常謹慎



遇到學生抱怨
一定放心上檢討
找到有效的方法!

Your most unhappy customers are your greatest source of learning. — *Bill Gates*

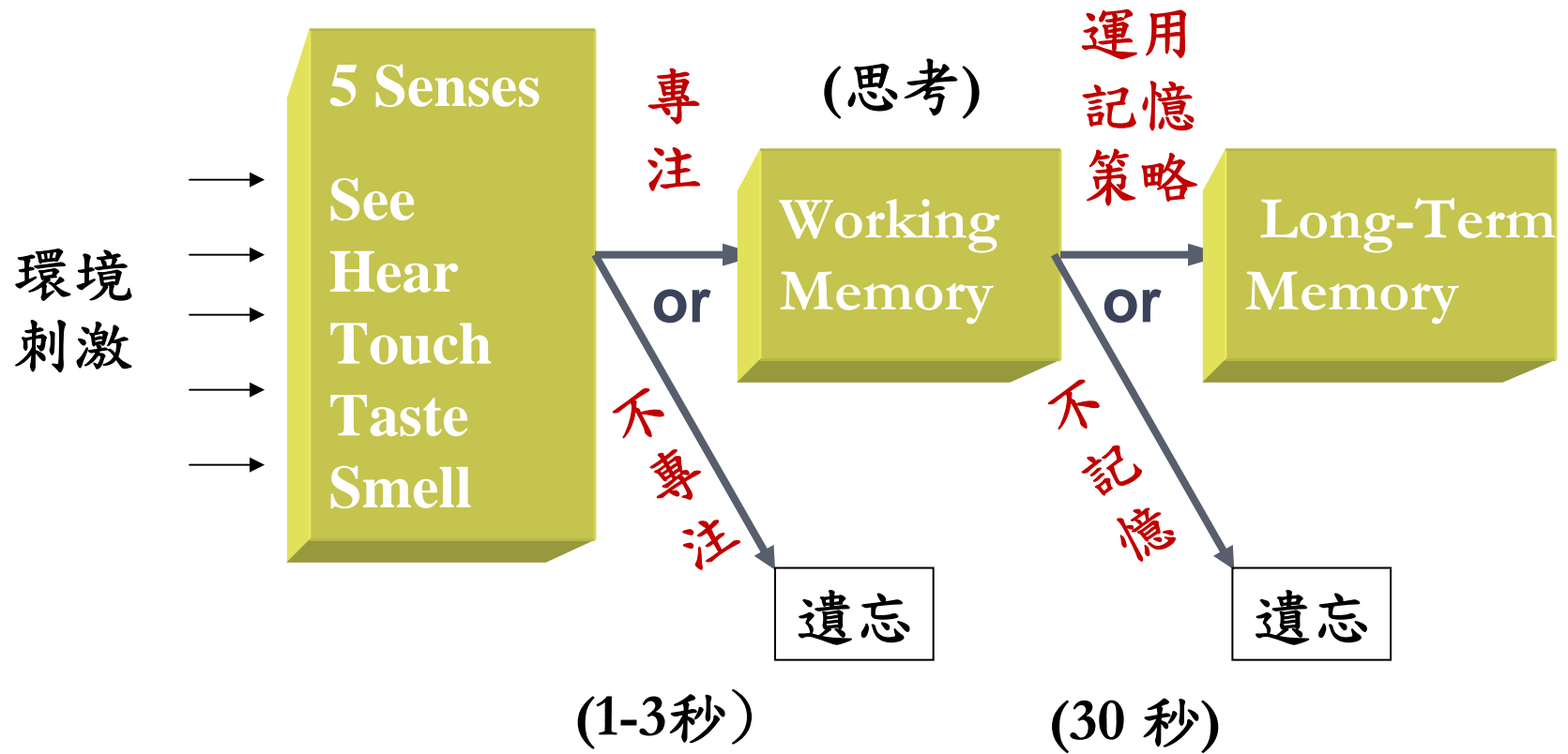


An American business magnate, philanthropist, author, and is chairman of Microsoft, the software company he founded with Paul Allen.*

*: http://en.wikipedia.org/wiki/Bill_Gates



WHY STUDENTS CAN'T RECALL FROM LECTURES?



Ref.: J. Diane Connell, Brain-based Strategies to Reach Every Learner, 2005, NY, Scholastic.

課堂或自修時，做到重複五到的學習。

MEMORY STRATEGIES

1. Link two or more pieces of information to form a greater whole.
2. Make connections between prior and new knowledge.
3. Using or Creating Images allow learners to use both right and left brain.
4. Give big pictures first and then ask learners to fill in details – Organize, Outline
5. Repetition allows activating the same network repeatedly, leading to stronger neural roads.
6. Take time to reflect. Reflection is a search for connections (作業).



用心將畢生所學

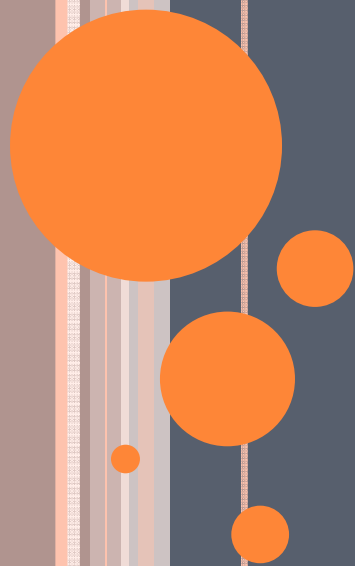
恭敬地

交棒給下一代

是

為人師

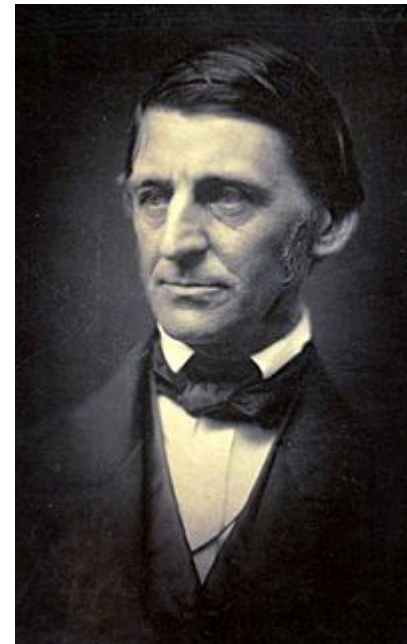
一生最大的榮耀！



***Enthusiasm** is the mother of effort, and without it nothing great was ever achieved.*

— *Ralph Waldo Emerson*

(May 25, 1803 – April 27, 1882) An American lecturer, philosopher, essayist, and poet, best remembered for leading the Transcendentalist movement of the mid-19th century.*

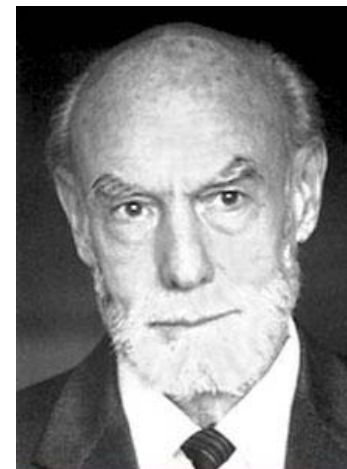


http://en.wikipedia.org/wiki/Ralph_Waldo_Emerson

全腦並用的英文自學能力

Roger Sperry

(1913年8月20日～1994年4月17日)



Roger Wolcott Sperry，美國神經生理學家，對於大腦半球研究獲得1981年諾貝爾生理學或醫學獎，Sperry在1976年進行了裂腦(split-brain)實驗，有一名病患無法控制癲癇，因為胼胝體短路，切除胼胝體後，Sperry的病人近乎正常，但接下來的測試發現，如果給予左右邊相同訊息，左右側腦卻感受到不同的視覺與觸覺信號，像是**右手與右眼能夠說出一個物體，卻無法解釋這是甚麼用途**，反之，**左手與左眼可以解釋用途，卻無法將之命名**，進一步研究顯示，**思想功能是在左腦或右腦的特定區域**，Sperry觀察到**兩個半腦各自獨立不互相牽制的運作情形**。而**正常人腦，左右半球能夠互相交流、互相抑制及牽制**，**訓練右腦的同時也會刺激到左腦**。

<http://www.fgu.edu.tw/~psychology/know/data/personal/RogerSperry.htm>

善用 GOOGLE 圖片和 YOUTUBE、TED 和其 他影片學習英文與科技

<http://www.TED.com>

[http:// www.youtube.com](http://www.youtube.com) – night vision system

Google Patent, Google Scholar, etc.

Search Business

Go

Financial Tools

Select a Financial Tool

More in Business »

World Business Markets Economy

SLIPSTREAM

Intuition + Money: An Aha Moment

By JOHN MARKOFF

Published: October 11, 2008

IT started with a Harvard physicist acting on a hunch. It ended up producing a new material, called black silicon, that could have a broad impact on technologies ranging from ultrasensitive sensors to photovoltaic cells.

Enlarge This Image



Rick Friedman for The New York Times

On Monday, Harvard plans to announce that it has licensed patents for black silicon to SiOnyx, a company in Beverly, Mass., that has raised \$11 million in venture financing.

This would never have happened if the physicist, Eric Mazur, and his graduate students had stuck to the original purpose of their research. He says their experience offers a lesson in government financing of science and technology, which is becoming so narrow and applied as to make discoveries like theirs much less likely.

英文雜誌
科技報導

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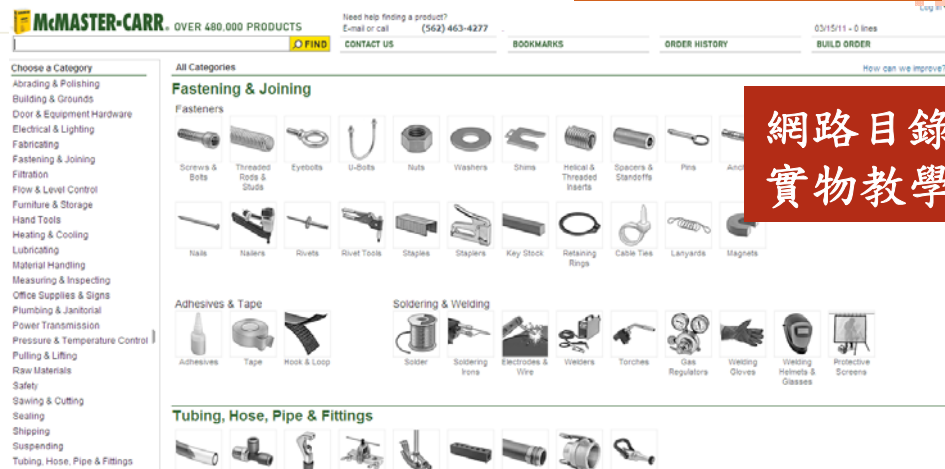
THE TREE OF LIFE
SUMMER



學校技轉
新創公司

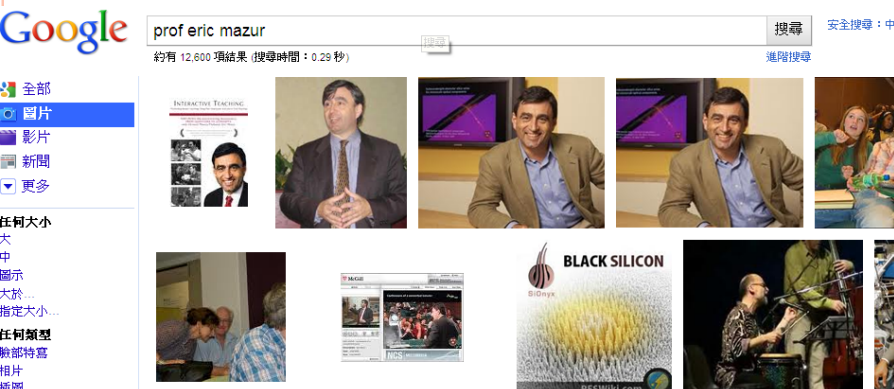
<http://www.sionyx.com/>

<http://www.mcmaster.com/#>



網路目錄
實物教學

<http://www.nytimes.com/2008/10/12/business/12stream.html>



"Tell me and I forget. Teach me and I remember. **Involve me and I learn.**" --
Benjamin Franklin



Wastes - What You Can Do

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Source Reduction Alternatives Around the Home

Many consumers look for ways to reduce the amount and toxicity of waste around the house. This can be done, in some cases, by using alternative methods or products without hazardous constituents to accomplish a certain task. Here are just a few ideas to get you started.

Although the suggested mixtures have less hazardous ingredients than many commercial cleaners and pesticides, they should be used and stored with similar caution. Please follow these guidelines for any household cleaner or pesticide.

Household Cleaners and Alternatives

Household Cleaner	Alternative
Drain cleaner	Use a plunger or plumber's snake.
Oven cleaner	Clean spills as soon as the oven cools using steel wool and baking soda; for tough stains, add salt (do not use this method in self-cleaning or continuous-cleaning ovens).
Glass cleaner	Mix 1 tablespoon of vinegar or lemon juice in 1 quart of water. Spray on and use newspaper to wipe dry.
Toilet bowl cleaner	Use a toilet brush and baking soda or vinegar. (This will clean but not disinfect.)
Furniture polish	Mix 1 teaspoon of lemon juice in 1 pint of mineral or vegetable oil, and wipe furniture.
Rug deodorizer	Deodorize dry carpets by sprinkling liberally with baking soda. Wait at least 15 minutes and vacuum. Repeat if necessary.
Silver polish	Boil 2 to 3 inches of water in a shallow pan with 1 teaspoon of salt, 1 teaspoon of baking soda, and a sheet of aluminum foil.
Plant sprays	
Mothballs	
Flea and tick products	

DO NOT mix anything with these alternatives.

If you do store a home remedy, label it clearly.

When preparing alternatives, use clean containers.



句子閱讀順序方法單元

- 問題：These photons travel at the speed of light.

(1)

這些光子

(2)

行進

(3)

以光速

中文譯句排序為？

- 老師的分享：同樣表達一個意思，英文句子中字的排序與中文字的排序有時相同，有時不同，可以利用畫底線編號的方法，嘗試不同的排序來找出正確的中文排序
- 活動方式：小組搶答
- 課堂練習：各種複雜句型的練習題
- 回家作業：提供已畫底線的練習題給同學練習

建議答案(1) (3) (2)



請分析下列各句，以紅色筆繪出中刮弧【】和小刮弧（）分別標示哪些部份是【限定子句】與（非限定子句），並以底線標示其修飾的名詞

- Green chemistry, also known as sustainable chemistry, is the design of chemical products and processes that reduce or eliminate the use or generation of hazardous substances.
- The primary way that EPA promotes green chemistry is through the prestigious Presidential Green Chemistry Challenge Awards.



REPLACE UNDERLINED WORDS WITH APPROPRIATE SYNONYMS

- Climate change refers to any important change in measures of climate (such as temperature, precipitation or wind) lasting for an extended period (decades or longer). Climate change is a problem that is affecting people and the environment. Larger energy efficiency and new technologies hold promise for decreasing greenhouse gases and solving this worldwide challenge.

勤查同義字的好處？



請分析下列各句，以紅色筆繪出中刮弧【】和小刮弧（）分別標示哪些部份是【限定子句】與（非限定子句），以底線標示其所修飾的名詞

- Is the green solvents research community investing time and effort in the areas of research that will give the maximum environmental benefit?
- Green chemistry, also called sustainable chemistry, is a philosophy of chemical research and engineering that encourages the design of products and processes that minimize the use and generation of hazardous substances.



英翻中技巧分享

(1) Electrons moving that quickly produce extremely bright light.

(1) 電子 (2) 那樣快速地移動的 (3) 產生 (4) 極亮的光束

中文翻譯數字與文字排序_____

(2) A technician examines the inner workings of the Australian synchrotron.

(1) 一位技師 (2) 檢查 (3) 內部的運轉 (4) 澳洲同步加速器

中文翻譯數字與文字排序_____

(3) Synchrotron techniques are also helpful in solving crimes.

(1) 同步加速器技術 (2) 也很有幫助 (3) 在解決犯罪事件上

中文翻譯數字與文字排序_____

(4) That's because they can identify speck of sweat, poison, and counterfeit ink

(1) 那是因為 (2) 它們可以辨識 (3) 汗液、毒藥，和偽造墨水的殘留痕跡

that are undetectable by conventional forensic techniques.

(4) 無法偵測到的 (5) 藉傳統鑑識技術

中文翻譯數字與文字排序_____

請分析下列各句，以紅色筆繪出中刮弧【】和小刮弧（）分別標示哪些部份是【限定子句】與（非限定子句），並以底線標示其修飾的名詞

- Green Chemistry is the utilisation of a set of principles that reduces or eliminates the use or generation of hazardous substances in the design, manufacture and application of chemical products.
- It is our goal to talk about the technologies that are available to us in order to achieve that, but also to have a dialogue about the issues that need to be resolved.



請分析下列各句，以紅色筆繪出中刮弧【】和小刮弧（）分別標示哪些部份是【限定子句】與（非限定子句），並以底線標示其修飾的名詞

- The green chemistry conference, which consisted of invited lectures, contributed posters, and discussion groups, was cosponsored by the American Chemical Society and the Green Chemistry Institute (GCI), which formed an alliance with ACS at the beginning of this year.
- Many of the issues that we are trying to address with green chemistry are global issues.
- Chemical developments also bring new environmental problems and harmful unexpected side effects, which result in the need for 'greener' chemical products.

- He says their experience offers a lesson in government financing of science and technology, which is becoming so narrow and applied as to make discoveries like theirs much less likely.



STATE-OF-THE-ART GRAPHICS REVEAL VORTEX PHYSICS -1

- Video link: <http://www.youtube.com/watch?v=vU6M5hAe-TU>
- These stunning graphics were recently screened at the SIGGRAPH _____ Animation Festival in Los Angeles, California. But they are not _____ a pretty show. They are actually modeling vortices with greater detail than ever _____. The interesting thing is the combination of state-of-the-art simulation the corresponding _____ and then the visualization of these _____. _____ techniques from graphics _____ volume rendering, you are able to _____ all the structure of the vortices in a way that we have _____ been to look __before.



THE GONZO SCIENTIST - FLUNKING SPORE -HW₁

- web link : <http://video.sciencemag.org/Featured/97836032001/1>
- You can learn a lot about _____ by playing the _____ game spore. What do you want to be _____ you evolve. Or, at least that's what the game's creator would like people to _____. To test that claim, I've been playing _____ with a team of scientists for more than a _____. It's taking us this long _____ spore is a big game. In fact, it's _____ games in one with _____ stage covering a _____ phase of evolution of _____ complexity. Starting with microbial cells _____ around in a primaries soup, you _____ into terrestrial species. Those form tribes. They become technologically _____. And finally you leave your planet and _____ the galaxy.

感謝

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必然是雙向的！