

# 111 年師資培育之大學外語領域教學研究中心（小學組） 師培社群讀書會記錄：第四場

共同閱讀圖書：Beyond CLIL: Pluriliteracies Teaching for Deeper Learning

作者：Coyle, D., & Meyer, O. (2021)

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閱讀章節：第四章：The Mechanics of Deeper Learning

第四章導讀者：周秋惠教授、簡靜雯教授 國立清華大學

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讀書會摘要：

簡靜雯教授針對了第四章的更深度學習 (deeper learning) 進行導讀。簡教授首先以她曾共備過的教案為例進行分享，此教案是以「舊鞋救命」的活動和「Me on the Map」做結合，旨在讓學生透過這個活動了解到如何利用自己身邊的資源來回饋社會並藉此反思，進而真正達到深度學習 (deep learning)，而不會只是讓知識停留在「學過了」的階段。



在看如何做深度學習 (deep learning) 時，也需要將內省 (intrapersonal) 以及人際 (interpersonal) 的要素考慮進去。而簡教授也在此處分享了另一個有關「Earth

Hour」關燈一小時的教案，並展示如何同時將素養、CLIL，以及語言知識融入進去，最後透過讓學生實踐力行，真正落實深度學習（deep learning）。

**Twenty-first Century Competencies**

Cognitive domain	Intrapersonal domain	Interpersonal domain
Cognitive processes & strategies Knowledge Creativity	Intellectual openness Work ethic & conscientiousness Positive core self-evaluation	Teamwork & collaboration Leadership
<b>Associated skills</b> Critical thinking Information literacy Reasoning Innovation	<b>Associated skills</b> Metacognition Flexibility Initiative Appreciation for diversity	<b>Associated skills</b> Communication Responsibility Conflict resolution

**4.1 How Knowledge Is Stored in Long-Term Memory**

Figure 4.1 Long-term memory (LTM) model

老師透過給學生足夠的鷹架、引導示範（modeling）等，也可以一步一步幫助學習者達到深度學習（deep learning），並能夠將習得知識儲存在長期記憶中。

陳怡伶教授回應：在帶學生專題時，如何搭鷹架給學生才能讓學生真的達到能夠有批判性的思考，並且在學生寫論文上能夠對他們有幫助也一直都是很苦惱的點，同時也覺得這塊「deep learning」非常重要。

周秋惠教授導讀第四章後半（4.4-4.7）部份，內容著重在「trajectories for deeper learning」以及「cognitive discourse functions」。

**BEYOND CLIL**

Pluriliteracies Teaching for Deeper Learning

Coyle, D., & Meyer, O. (2021)  
Cambridge, UK: Cambridge University Press

Chapter 4 The Mechanics of Deeper Learning

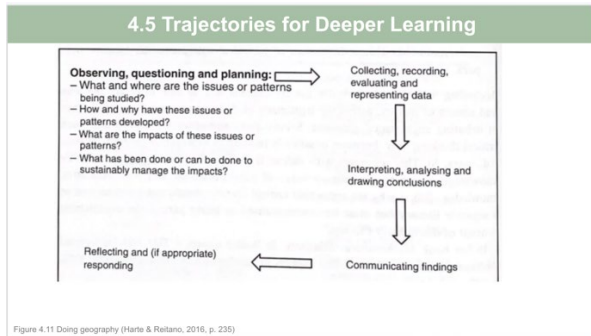
導讀者：周秋惠教授、蔣靜雯教授 國立清華大學

師培出版計畫  
111年度外語環境教育研究計畫

Chapter 4

- 4.1 How Knowledge Is Stored in Long-Term Memory
- 4.2 Internalisation of Conceptual Knowledge
- 4.3 Re-evaluating the Role of Practice
- 4.4 Transfer of Learning Revisited
- 4.5 Trajectories for Deeper Learning
- 4.6 Visualising Deeper Learning
- 4.7 Cognitive Discourse Functions: Keys to Deeper Learning

周教授首先介紹深度學習的軌跡（trajectories for deeper learning），並針對第 58 頁的其中一個重點進行討論。周教授將此關鍵重點連結到她在前一週到小學觀課的經驗，那是一個四年級的綜合課。這個四年級綜合課的活動主要是想檢核學生是否有將知識轉化成實際可運用、帶得走的能力，也就是連結到本章的學習遷移（transfer of learning）的概念。



### 4.4 Transfer of Learning Revisited

Page 58  
 Transferable knowledge is a key element of deeper learning.  
 (知識如何轉換成運用能力：帶的走的能力)

- Two key aspects of deeper learning: Innovation and efficiency
- Problem-solving skills

**Increasing engagement**, focusing on deep understanding and helping learners see the deeper structures of a problem through careful analysis of its surface features.

- The importance of social context of learning

Figure 4.9 Corridor of optimal adaptability (adapted from Schwartz et al., 2012)

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Figure 4.8 'Transfer out' vs. 'transfer in' (adapted from Schwartz et al., 2012)

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**Increasing engagement**, focusing on deep understanding and helping learners see the deeper structures of a problem through careful analysis of its surface features.

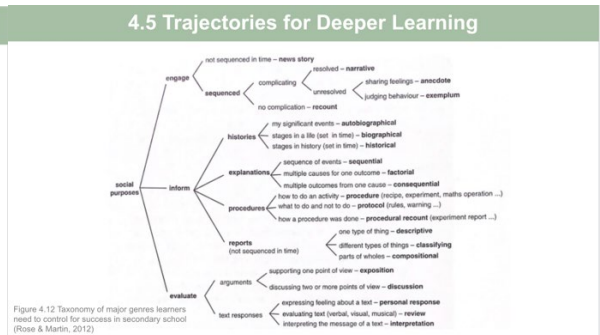
- The importance of social context of learning

Figure 4.9 Corridor of optimal adaptability (adapted from Schwartz et al., 2012)


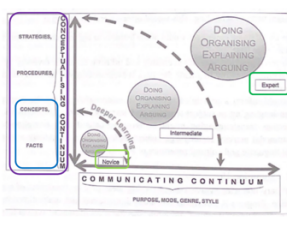
周教授以圖 4.12 探討關於深度學習：從投入 (engage) 一直到最後評估 (evaluate) 的過程，並提到或許可以用這張圖表上所整理的所有概念，來幫助老師在設計教學活動時，可以更有效地讓學生去探索每個不同的議題。

### 4.5 Trajectories for Deeper Learning

Table 4.2 Scientific processes, genres and purposes (based on Pollak, 2016)		
Scientific processes	Genres	Purposes
Doing things scientifically	Experiments & protocols Laboratory reports Investigations	Instruct someone how to do things Provide a record of the method, as well as the results, discussions and conclusions. Set out the design and decisions behind students' attempts to behave scientifically
Describing it organically the world scientifically	Descriptions Comparisons Compositions Classifications	Describe multiple aspects/features of a natural or physical phenomenon Compare features two or more physical phenomena Present (describe and/or define) Present different types/classes of a phenomenon
Explaining phenomena scientifically	Temporal explanations (e.g. sequential explanations) Non-temporal explanations (e.g. factorial/consequential explanations, theoretical explanations)	Explain physical phenomena by presenting the events producing the phenomena in chronological order Explain the multiple factors/consequences that contribute to a particular event or phenomenon Define and illustrate a theoretical principle
Arguing scientifically	Arguments Discussions	Persuade to agree with a particular point of view or an issue and sometimes exhort the reader/listener to take action Present the case for issue thus use point of view



本書圖 4.14 所呈現的圖象化深度學習 (visualizing deeper learning) 主要是在解釋語言學習者如何從 X 軸橫向的「communicating continuum」一直慢慢發展，透過不斷地進行深度學習的過程，才能夠逐漸往 Y 軸縱向的發展「cognition increasing」，最終達到圖表上所顯示的 intermediate 及 expert 的位置。而本章最後有一個總圖表則是會更清楚呈現語言學習者 (novice) 如何透過一個個小資訊的拼湊，到最後發展成為進階語言學習者 (intermediate) 及語言學習專家 (expert) 的地位。

4.5 Trajectories for Deeper Learning	4.6 Visualising Deeper Learning
 <p>Figure 4.13 Towards a more inclusive made continuum</p>	<p>Page 76  <b>4.6 Visualizing Deeper Learning</b>          Focusing on two key dimensions of meaning-making: knowledge construction and knowledge communication.</p> <p>The PTDL (Pluriliteracies Teaching for Deeper Learning) model details how meaning-making potential can be systematically built and increased within that pedagogic space to help learners advance from <b>literacies novices</b> to <b>literacies experts</b>.</p> <p>Accordingly, process in pluriliteracies encompasses an increase in <b>conceptual understanding of content knowledge</b> as well as growing command of <b>subject-specific procedures, skills and strategies</b>.</p>  <p>Figure 4.14 Connecting two axes of the PTDL model (Graz Group, 2015)</p>

接著，周教授整理出一個要強調的新概念，如本書圖 4.15（下圖）所示，學科語言（subject-specific language）、通用學術語言（generic academic language），以及通俗口語（colloquial language）三者應是密不可分的，而周教授也提到在設計給小朋友的課程活動時也應考慮到如何將這三者同時融入進去。

「Cognitive Discourse Function (CDFs)」則是由認知架構（cognitive structure）及概念形成（concept formation）兩個層面所組成，也就是在學生獲得並知道知識後如何去處理及消化。而 CDFs 也被認為是能夠促進學習者深化學習的一個至關重要的關鍵。

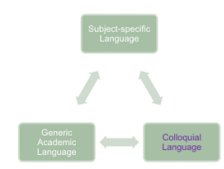
4.6 Visualising Deeper Learning	4.7 Cognitive Discourse Functions: Keys to Deeper Learning
<p>The relationship between the three are dynamic and complex, not in a linear way.</p> <ol style="list-style-type: none"> <li>The authors conceptualize <b>academic language or language of schooling</b> as consisting of both subject-specific and generic language elements.</li> <li><b>Academic language</b> offers learners ways to abstract complex ideas, whereas the use of <b>colloquial language</b> is ideal for expressing content and negotiating meaning in highly accessible and more concrete ways.</li> </ol>  <p>Figure 4.15 Components of language of schooling Page 77</p>	<p>Page 78  <b>Cognitive Discourse Functions (CDFs): "cognitive structure" and "concept formation"</b>          CDFs is highly conducive to promoting deeper understanding and command of subject-specific discourse/language of schooling.</p> <ul style="list-style-type: none"> <li>CDFs are essential tools for integrating the <b>conceptual and communicative dimensions of learning</b>.</li> <li>CDFs enable teachers to design lessons which are <b>more output-oriented</b> and which focus on <b>making learning visible</b>.</li> <li>Crucially, CDFs function as <b>building blocks</b> for larger text types or genres. Understanding how CDFs can be adapted to verbalize cognitive patterns of varying conceptual complexity guides teachers in <b>differentiating subject-specific instruction for deeper learning</b> by <b>aligning disciplinary demands with learner strengths and needs</b>.</li> </ul>

圖 4.4 則是提到各 CDF 的標籤（label）都是建立在布魯姆學習分類（Bloom's Taxonomy）的架構之上。周教授也提及在看教育現場學科領域時，會發現許多學科老師都是比較少針對概念的講述與語言學習做結合，也因此周教授也認為學科領域老師若是可以認知到將概念講述及語言做結合，對學習者的學習經驗發展會較有幫助。

此外，周教授也提及雖然 CDFs 在觀課時會看到老師在教學上展現，但是針對鷹架（scaffolding）及練習活動時，都較少在學生身上看到，因此此概念的運用也應多著重在學習者實際的使用（learner's actual use）。

4.7 Cognitive Discourse Functions: Keys to Deeper Learning

Page 80  
Operating at the interface **between thinking and language**, CDFs serve as linguistic representations of cognitive learning goals.

Dalton-Puffer's construct of CDFs consists of **seven** elements which can each be conceived as a category comprising several members that differ both in size and scope.

CDF Type	Label	Communicative Intention	Members
1	Classify	I tell you how we can cut up the world according to certain ideas.	Classify, compare, contrast, match, structure, categorize, subsume
2	Define	I tell you about the extension of this object of specific knowledge.	Define, identify, characterize
3	Describe	I tell you details of what can be seen (including metaphorically).	Describe, label, identify, name, specify
4	Evaluate	I tell you what my position is vis-à-vis X.	Evaluate, judge, argue, justify, take a stance, critique, recommend, comment, reflect, appreciate
5	Explain	I give you a reason for and tell you the cause of X.	Explain, reason, express cause/effect, draw conclusions, deduce
6	Explore	I tell you something that is potential.	Explore, hypothesize, speculate, predict, guess, estimate, anticipate, take other perspectives
7	Report	I tell you about something external to our immediate context on which I have a legitimate knowledge claim.	Report, inform, recount, narrate, present, summarize, relate

1. In most classrooms observed, more emphasis is placed on the teachers using these CDFs in their instructions than on the **learners' actual use and mastery of them**.

CDFs: 觀課時較常看到老師教學展現學生展現力較少看到

2. There is a subject-specific dimension to CDFs. Example: Arguing history is different from arguing math or geography. (不同學科CDFs不一樣)

How? Teachers providing **scaffolding and practice activities** to promote understanding (via the process of internalization) and skill development (through the process of automatization)

This will reap dividends because teachers will be presented with valuable opportunities to formatively assess the level of understanding of their students. **Explicit focus on CDFs is an essential step in moving from an input- to a more out-oriented curriculum.**

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接著周教授舉了一個海岸環境問題 (environmental problems in the coastal area) 的教案來作為「structure of a multi-causal explanation」的實例。

4.7 Cognitive Discourse Functions: Keys to Deeper Learning

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Explicit focus on CDFs is an essential step in moving from an input- to a more out-oriented curriculum.

**practical example**  
As a chemistry unit, learners might initially focus on **describing** the setup of an experiment and **hypothesize** about the outcome of that experiment, which will be conducted in the course of the next few lessons. After planning and conducting the actual experiment, they might move on to focus on **reporting** and **explaining** their findings before subsequently using their data to formulate a **definition** and embed those micro-genes into a larger one by writing a lab-report.

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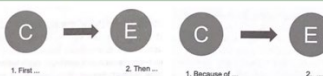


Figure 4.16 Structure of a temporal explanation

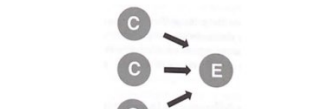


Figure 4.17 Structure of a mono-causal explanation

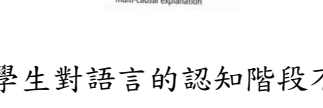


Figure 4.18 Structure of a multi-causal explanation

Environmental Problems in the Coastal Area

Fill in the blanks.

seawater	groundwater	coastal pollution
ground water	sea pollution	coastal pollution
ground water	sea pollution	coastal pollution

What is the problem? Pollution from the beach.

What is the problem? Pollution from the beach.

What does it cause? To cause...

What does it cause? To cause...

How can we solve the problem? We can do this.

How can we solve the problem? We can do this.

而在這個教案的實際進行中，由於每一位學生對語言的認知階段不同，因此學習路徑也不同。由觀察每一位學生的學習路徑，可以看出在此教案中學習者的學習多樣性；圖 4.19 即在說明從新手學習者 (novice) 階段一直到進階學習者 (advanced) 階段過程中不同學習者的學習路徑。

4.7 Cognitive Discourse Functions: Keys to Deeper Learning

Environmental Problems in the Coastal Area

Genre/Literacy Level	Micro-Level (i.e. expansion)	Conceptualizing (i.e. problem & communicating)	Macro-Level (i.e. no report)
Novice			
Intermediate			
Advanced			

Figure 4.19 Visualising the role of CDFs in pluriliteracies development

簡雅臻教授提問：更深度學習 (deeper learning) 是否有強調最大化的學習產出 (maximize output) ?

周秋惠教授回應：深度學習 (deeper learning) 主要是要看圖像式深化學習 (visualize deeper learning)，主要也是想著重給學生做的部分。

鄭錦桂教授提問：分享中有許多教案都非常有趣，特別是加入了很多親身實作的活動

(hands-on activity)，尤其是最後一個將「unscrambling」活動融入 CLIL 課程的教案，更可以讓學生真正親身參與活動。一般在 CLIL 課程裡看到的大多是停留在句型的層次 (sentence level)、或以下，但剛才分享的教案是可以達到話語對談的層次 (discourse level)，並且可以讓學生自主學習，同時也提供了文本作為學生的鷹架，也因此這個教案的活動讓人印象非常深刻。另外，前面所提到關於讓學生測量手臂長是否等於身高的這個活動，是否和教案本身的主題認識動物有關聯性？

周秋惠教授回應：這個教案主要是要讓學生認識動物的特徵並且探索動物，為了讓學生能夠投入參與 (engage)，會在介紹動物時帶入一些有趣的資訊 (fun fact)；或是可能會透過問學生一些像是校園內有沒有樟樹這樣的問題，來引發學生的學習興趣並藉此檢核學生是否知道該物種的基本概念。