

# Thinking and Language Learning

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*‘Learning without thought is labour  
lost’*

Confucius

# Thinking and learning

- Why thinking?
  - vital part of language learning (Skehan 1998)
  - major overall educational goal (Nunan 1999, Part I)
  - motivation (cf. Ur 2103)
- Getting EFL learners to think therefore very important
- BUT:
  - What do we mean by thinking?
  - What kind of activities involve what kinds of thinking?
  - How can thinking be done by learners at the lower language levels?

# What is thinking?

- Definition: the kinds of mental operations used by learners in the learning process
- Many possible conceptual frameworks (cf. Ur 2013), e. g:
  - ‘Critical’ vs. ‘creative’
  - ‘Convergent’ vs. ‘divergent’
  - ‘LOTS’ vs. ‘HOTS’
- Bloom 1956 → Sanders 1966 (cf. Adams–Smith 1981; Kratwohl 2002)
- Also see Waters 2006

# Levels of thinking (Sanders 1966)

	Level	Activity
1	<b>Memory</b> (recognizing/ remembering)	<ul style="list-style-type: none"> <li>Understanding a vocabulary or grammar rule explanation, doing a ‘mechanical’ drill, using prior knowledge when reading/listening to a comprehension passage, etc. – e.g., <i>‘Correct these instructions for making a paper model of a boat’</i></li> </ul>
2	<b>Translation</b> (reformulating information)	<ul style="list-style-type: none"> <li>Doing substitution tables, information transfer activities, etc. – e.g., <i>‘Use the corrected instructions to make the model of the boat’</i></li> </ul>
3	<b>Interpretation</b> (identifying relationships)	<ul style="list-style-type: none"> <li>Discovering logical connections in ‘non-linguistic’ content, working out the meaning of unknown words, grammatical rules, etc. – e.g., <i>‘Look at the form of the verbs (the imperative) in the instructions (e.g., “<u>Fold</u> the paper in half”) and then complete this sentence: To make the imperative, we use the [infinitive/’ to’ form] without [to].’</i></li> </ul>

# LEVELS OF THINKING (contd.)

	Level	Activity
4	<b>Application</b> (guided use of new knowledge)	<ul style="list-style-type: none"><li>• <i>‘Use the drawings you have been given to produce a set of instructions for making a paper aeroplane’</i></li></ul>
5	<b>Analysis</b> (freer application of new knowledge)	<ul style="list-style-type: none"><li>• <i>‘Think of a paper model you know how to construct and produce instructions for making it’</i></li></ul>
6	<b>Synthesis</b> (creative application of new knowledge)	<ul style="list-style-type: none"><li>• <i>‘Think about how you could construct a new paper model (e.g., of the Beijing National Olympic Stadium), and produce instructions for making it’</i></li></ul>
7	<b>Evaluation</b> (meeting criteria for the application of new knowledge)	<ul style="list-style-type: none"><li>• <i>‘Think about how you could construct a new paper model (e.g., of the Beijing National Olympic Stadium) in the simplest way, and produce instructions for making it’</i></li></ul>

# (contd.)

- Learning involves **two overall levels** of thinking (see, e.g., Bruner 1973; Johnson 2008: 101-2; Gagné 1975).

A	1 - 2: Staying <i>within</i> the information given	1 - 3: Learning <i>about</i>
B	3 - 7: Going <i>beyond</i> the information given	4 - 7: Learning <i>how to</i>

- Also, thinking is hierarchical: ‘*[The] categories are sequential and cumulative. In other words, each category of thinking has unique elements but also includes some form of all the lower elements*’ (Sanders 1966: 9 - 10)
- Learners therefore first need to think at Level A in order to think at Level B - this requires a **two-level** teaching approach (cf. Hutchingson & Waters

# Two-level learning unit design

- Teaching context: class of 14 year-old low intermediate-level (CEF 'B1' level) EFL students in state-sector school
- Unit INPUT text (full text = c. 175 words):

## ROBOTS - THE IDEAL WORKERS?

*We hear many complaints about work in factories: the work is often boring, heavy and repetitive; the workers do not have to think about the work; they get no job satisfaction.*

*The answer: a robot. For many jobs a robot is much better than a human... It never gets bored; it works at a constant speed; it doesn't make mistakes ... Robots can be designed to do almost any job. You can't change the human body, but a robot's arms, for example, can be*

# Two-level learning unit design (contd.)

- **Step 1:** design an appropriate ‘Level B’ ‘TASK’ , i.e., a holistic application of the main language and ideas in the INPUT
- Main TASK design criteria: **i)** creative and challenging, **ii)** relevant to the INPUT in terms of LANGUAGE and CONTENT, e.g:
  1. Describe the kinds of jobs robots are likely to carry out in the future
  2. Discuss whether you think robots are going to create more or fewer jobs
  3. List the advantages of human beings over robots
  4. Consider the advantages and disadvantages of vehicles vs. animals as a means of transport



# Two-level learning unit design (contd.)

- **Step 2:** develop appropriate ‘Level A’ exercises by working out what main language and content knowledge learners need for doing the chosen TASK. (Do it **as the typical learner would**, then analyze the results.)

- TASK: You are going on an expedition across the Sahara desert. You can take either a car or a camel.
- a. Work out the advantages and disadvantages of each. Make a list like this:

CAR		CAMEL	
advantages	disadvantages	advantages	disadvantages

- b. Make your decision

[ + map and route]

# Two-level learning unit design (contd.)

CAR		CAMEL	
advantages	disadvantages	advantages	disadvantages
<ul style="list-style-type: none"> <li>• more comfortable</li> <li>• can carry more</li> <li>• cooler</li> <li>• can travel faster (etc.)</li> </ul>	<ul style="list-style-type: none"> <li>• not good in sand</li> <li>• can break down</li> <li>• more expensive</li> <li>• not 'green' enough (etc.)</li> </ul>	<ul style="list-style-type: none"> <li>• doesn't use petrol</li> <li>• doesn't need roads</li> <li>• better for the environment</li> <li>• can be a friend (etc.)</li> </ul>	<ul style="list-style-type: none"> <li>• too slow</li> <li>• hotter</li> <li>• uncomfortable</li> <li>• can't be used in other places (etc.)</li> </ul>

## ANALYSIS

- possible **language** knowledge topics: negatives; comparatives; can/can't (etc.)
- possible **content** knowledge topics: thinking about advantages and disadvantages; comparing 'animal' and mechanical abilities, giving reasons (etc.)

# Two-level learning unit design (contd.)

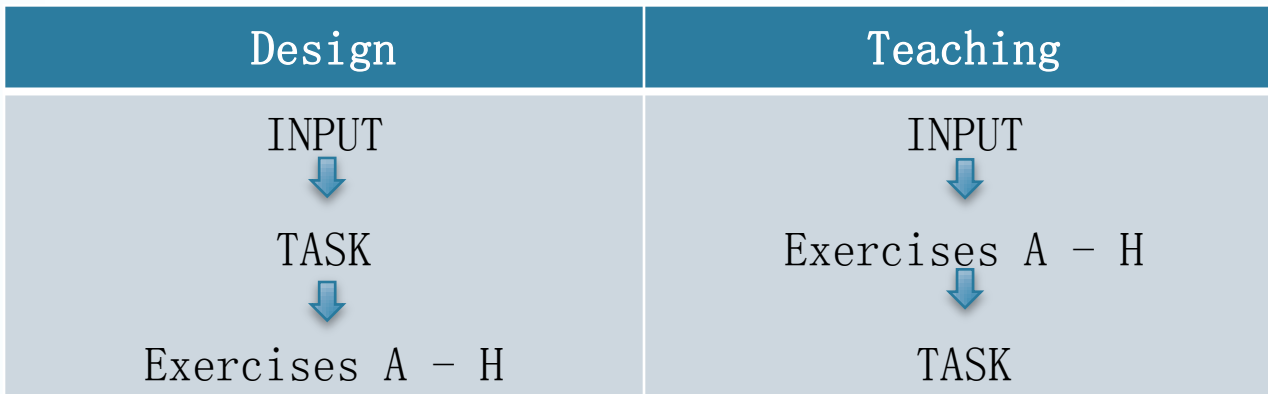
- **Step 3:** develop exercises for the language and content topics, e.g:
  - A. Make a list of the **advantages** of robots in the text and the implied **disadvantages** of humans (e.g., *They never get bored* vs. *They get bored*) [Levels 1 & 2]
  - B. Vocabulary check: i) complete gaps in further short text about benefits of robots and ii) find expressions that mean the same as e.g., *unchanging* (i.e., ‘constant’) [Level 3]
  - C. Make a list of the **advantages** humans have over robots [Level 3]
  - D. **Negatives:** change the sentences provided like this, e.g.,  
*A robot never gets bored.* → *A robot does not get bored.* /  
*Robots never get bored.* → *Robots do not bored.* [Level 2]

# Two-level learning unit design (contd.)

- E. Contrasts:** use the information you put down in A. and C. (above) to compare robots and people, e.g., *Men and women need to rest, but a robot doesn't./Robots have to be programmed, but people don't.* [Level 2]
- F. Giving reasons:** You are planning a factory operated totally by robots: Make a list of what you don't need and why, e.g., *You don't need a cafeteria to provide meals, because robots don't eat.* [Level 4]
- G. Too/enough:** *This factory is too dangerous for people to work in.* This means the same as: *This factory is not safe enough for people to work in.* Change the sentences provided in the same way. [Level 2]
- H. Comparing abilities:** Look at this comparison – *A man can think about his work, but a robot can't.* Make similar sentences from the cues provided (they are not all in the right order). [Level 2]

# Two-level learning unit design (contd.)

- Design vs. teaching sequences:



- The TASK is at Level B, but its design and Exercises A - H make it manageable for lower language-level learners
- I. e., the key to enabling learners to carry out higher-level thinking activities is to:
  - i. design a TASK with high-level thinking **but also** involving the right language level
  - ii. do the necessary assumed lower-level thinking work with the learners beforehand

# Conclusion

- **Both** ‘Level A’ and ‘Level B’ types of thinking are necessary for learning
- But often assumed that ‘Level B’ thinking can only be done if learners also already have a relatively high language level
- However, there is no necessary connection between level of language and level of thinking
- Using a ‘two-level’ teaching approach enables learners with lower language levels to take part in ‘Level B’ as well as ‘Level A’ thinking
  - *‘I think, therefore I learn!’*

# References

- Adams–Smith, D. (1981). ‘Levels of questioning: teaching creative thinking through ESP’ . *English Teaching Forum*. January 15–17: 21.
- Bloom B. S. (ed). (1956). *A Taxonomy of Educational Objectives*. New York: Longman.
- Bruner, J (1973). *Going Beyond the Information Given*. New York: Norton.
- Gagné, R. (1975). *Essentials of Learning for Instruction*. [Expanded edition] Hinsdale, Illinois: Dryden Press.
- Johnson, K. (2008). *An introduction to foreign language learning and teaching*. (2nd edition ed.) Harlow, Essex: Pearson Education Ltd.
- Hutchinson, T., & Waters, A. (1987)/(2002). *English for specific purposes : a learning-centred approach*. Cambridge Cambridge University Press/Shanghai: Shanghai Foreign Language Education Press.

## References (contd.)

- Krathwohl, D. R. (2002). 'A revision of Bloom's taxonomy: An overview.' *Theory into Practice*, 41(4), 212-218.
- Nunan, D. (1999). *Second language teaching & learning*. Boston, Mass.: Heinle & Heinle.
- Sanders, N. M. (1966). *Classroom Questions - What Kinds?* New York: Harper and Row.
- Skehan, P. (1998). *A cognitive approach to language learning*. Oxford: Oxford University Press.
- Ur, P (2103). 'Language-learning task design: Using higher-order thinking skills.' *IATEFL Webinar*
- Waters, A. (2006). 'Thinking and language learning.' *ELT Journal*, 60(4), 319-327.