Explicit Inclusion of Thinking Skills in the Learning of Second Languages

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Abstract

This paper explains why and how thinking skills should be included in the teaching of second languages and other subjects. The authors provide examples from their lessons in four thinking skills: being careful in the use of absolute words, avoiding unsupported generalizations, using counterexamples, and identifying assumptions. Also, the authors offer suggestions on how to enhance student-student interaction in the learning of thinking skills.

Keywords: thinking skills, teaching thinking, learning across the curriculum, engagement as citizens, student-student interaction

Introduction

Education for students of all ages and in all subject areas is experiencing a paradigm shift that began about 40 years ago with moves towards cognitivism (Gardner, 1985) and social-cognitivism (Vygotsky, 1978). The effects of this paradigm shift can be seen in the learning of literacy. No longer does it suffice for students to be able to comprehend the meanings intended by the authors of the texts they read, hear, and view. Now, students need to also be able to look beneath the explicit messages of texts in order to critically analyse what the authors are saying and not saying, what the authors' goals were in creating the texts, and how the authors are attempting to use the texts to accomplish their goals.

In this critical literacy approach, students develop and mobilize their thinking skills. These skills include comparing, questioning, connecting, expanding on, giving opinions about, applying, evaluating, and investigating (Scriven & Paul, 1987). Especially with greater awareness nowadays of 'fake news' (Peters, Rider, Hyvönen, & Besley, 2018), educators appreciate that literacy instruction without the inclusion of critical literacy leaves students unprepared for their roles as citizens of an increasingly globalized and wired world. Since the days of Confucius and Socrates, scholars including Decartes, Bacon, and Dewey, have urged the inclusion of the learning of thinking skills as a fundamental aspect of education in the belief that, unguided, students and people generally do not learn to think in what they considered to be a proper manner (Paul, Elder, & Bartell, 1997).

Many scholars have investigated the integration of thinking skills as part of second language learning (e.g., Atkinson, 1997; Belcher, 1995; Gajdusek & vanDommelen, 1993; Guo, 2013; Miller, 2015; Phung, 2010). Zhou (2016) argued that thinking, including logic, is not only important for the receptive language acts of listening, reading, and viewing, but also

for the productive language act of writing. The relevance of thinking skills can be extended to the other two main productive language acts: speaking and producing (e.g., videos). (Dawes, Mercer, & Wegerif, 2004). Zhou (2016) studied the second language writing of tertiary students in China and made an important point by highlighting cross-cultural differences in thinking patterns. In so doing, she echoed a point made earlier in seminal works by Kaplan (1966) and Hofstede (1984). Kaplan (p. 2) noted that "Logic (in the popular rather than the logician's sense of the word), which is the basis of rhetoric, is evolved out of a culture; it is not universal. Rhetoric, then, is not universal either, but varies from culture to culture and even time to time within a given culture." For instance, Kaplan found that the writing pattern of his Korean and Chinese students tended to be more circular than the pattern prescribed in Western academia. Of course, different does not necessarily mean better or worse, but this variance in how diverse cultures manifest thinking makes explicit teaching of thinking skills, sometimes including a cross-cultural element, even more important and suggests that acquisition of thinking skills should not be taken for granted.

This article begins with general background on how thinking can be explicitly included in learning. This involves methods of scaffolded instruction on thinking skills. The article's following two sections describe how two Singapore tertiary teachers infuse direct instruction on thinking into their classes with predominantly second language learners. The description includes four example lessons. The article's final section provides additional means to use peer scaffolding to enhance second language learners' thinking skills.

How To Teach Thinking

Unfortunately, too often, teachers, especially tertiary teachers, believe that students should already have mastered thinking skills. Furthermore, second language teachers may believe that their task involves only students' acquisition of vocabulary and grammar. These teachers feel that the thinking students do with the second language lies beyond the scope of teachers' responsibilities. Fortunately, modern pedagogy, influenced by cognitivism, has developed many cross-curricular ways that students can learn thinking skills as an important adjunct to preparation for exams and other forms of assessment.

Influenced by cognitivism and social-cognitivism, many second language classroom learning activities involve some form of scaffolding (Vygotsky, 1978; Wood, Bruner, & Ross, 1972). In scaffolding, the more students acquire knowledge and develop skills, the more independent of teachers the students become. For example, a common scaffolding pattern begins with teacher input, followed by students being able to notice patterns that the teachers explained. Next, students complete partially realized examples, before finally creating their own exemplars of the pattern the teachers described at the beginning of the lesson. Then, students use those exemplars as part of general tasks, such as projects. In the following example, scaffolding helps students learn to write topic sentences. This learning involves the thinking skill of generalization.

1. The scaffolding begins as the teacher explains that often in Western academic writing, paragraphs begin with a topic sentence. The topic sentence is the most general sentence in the paragraph, and the subsequent sentences are more specific, providing support for the topic sentence.
2. In the noticing step in scaffolding, the students look at paragraphs, identify the topic sentence in each, and discuss how that is the most general sentence and how the other sentences are less general. Please note that in this step of the scaffolding, students create no text; they only notice features of fully formed texts.

3. In the next step in the scaffolding, students play a role in creating text. They might do a multiple choice task, where they select sentences that fit with a particular topic sentence. Another possibility, one which involves more independence from teachers, is for students to write supporting sentences for a given topic sentence or to create a topic sentence for a paragraph that lacks one.
4. Finally, students, alone or in groups, build their own paragraphs, complete with topic sentences and supporting sentences. Even though it seems that students are on their own in this step, help remains at the ready, in the form of classmates and the ever vigilant teacher.

One aspect of scaffolding involves learning relevant vocabulary. Such vocabulary aid metacognition (Flavell, 1979), i.e., thinking about thinking, because grasping the vocabulary surrounding a concept empowers thinking about that and related concepts, as the relevant words serve as thinking tools. Metacognition allows students to be more conscious about what they are doing and why they are doing it, as well as helping students to share their processes with others. Among the many terms that may promote thinking skills are, as we will see in the next section, *absolute words* and *unsupported generalization*.

In language teaching, the three-step Presentation-Practice-Production model (Criado, 2013) represents one form of scaffolding. In the Presentation (P1) step, teachers and/or teaching materials show the language element upon which the lesson will focus. A key element of this step is comprehensible input (Krashen, 2004a). In a manner reminiscent of Vygotsky's Zone of Proximal Development (1978), the Comprehensible Input Hypothesis states that large quantities of input (via reading and listening) at a level that is comprehensible yet contains new language elements, such as vocabulary and grammar, drive language acquisition. Narrow reading (Krashen, 2004b) provides one way for students to gain such comprehensible input at the same time they acquire the content needed to write convincingly on a topic. Narrow reading involves reading in quantity on a particular topic, in a particular genre, or of works by a particular author or in a particular series (Renandya, Krashen, & Jacobs, in press).

In the Practice (P2) step, students apply what they have acquired in the presentation step, i.e., from their reading and from the presentation and explanation of models. This acquisition is applied to tasks prepared by teachers and materials developers. However, this practice should not be mindless filling in the blanks. Instead, students are consciously applying what they learned in Presentation step, but in a controlled context which helps them succeed.

Students take on more control in the Production (P3) step, often creating their own language relevant to the language elements of the lesson.

The next two sections of this paper explain how each of the two teachers, in cooperation with their students, used their own version of scaffolding to facilitate the students' development of thinking skills.

One Way To Teach Thinking Skills

The first author, G, teaches academic writing. Most of his students are second language users of English. To promote students' general language acquisition, G and his colleagues facilitate students' extensive reading (Krashen, 2004) in order that students obtain large quantities of comprehensible input. G and his colleagues' face-to-face contact with students consists of assisting individuals and groups of two to four students, as well as

leading workshops. Thinking skills are included in all of G's teaching of writing, as he agrees with the arguments made in the earlier sections of this paper about the importance of students building their ability to think. G and his students use activities that scaffold thinking skills via a four-part procedure:

1. Teacher explains the thinking skill.
2. Teacher uses a mini text to provide a negative example of the skill, and students work with a partner to identify the error and then rewrite the mini text to remediate the teacher's negative example.
3. Students work alone to create their own mini texts with negative examples of the thinking skill, and partners identify the error and rewrite each other's mini texts to remediate the partner's negative example. Teacher circulates and scaffolds, including sharing good examples from one pair of students with other pairs.
4. Pairs share their examples and remediations with other pairs.

Example Activity 1 - Thinking Skill: Being careful when using absolute words

Part 1. Explanation by the teacher: Absolute words, such as 'never' and 'everyone', apply to all situations and all beings and things. However, in reality, absolute words are seldom appropriate in academic writing, where we focus on precision. Can you think of any phenomena for which an absolute word is appropriate?

Part 2.

a. Teacher provides the following mini text with a negative example: "JCU (James Cook University) students are always helpful to one another." Note that the example is relevant to students' lives (Covel, 2010), as they are students at JCU. Also, the example shows students in a favourable light.
b. Students work alone and then consult partners to identify the error in the negative example and to rewrite the mini text to remediate the teacher-created negative example. The absolute word is 'always". One way to rewrite the sentence is: "JCU students are usually helpful to one another".

Part 3.

a. Students work alone to create their own mini texts with negative examples of absolute words, e.g., "Every JCU lecturer gives top grades to all their students".
b. Students exchange mini texts, identify the errors, and remediate the text, e.g., 'every' and 'all' are absolute words, and a remediated version of the text might be: "Only two JCU lecturers do not give top grades to almost all of their students." (Note: potential JCU students should be warned that this sentence was created only to illustrate a thinking skill and is not accurate ☺.)

Example Activity 2 - Thinking Skill: Avoiding unsupported generalizations

Part 1. Explanation by the teacher: An unsupported generalisation goes from the specific to the general without sufficient justification. For example, it would be an unsupported generalization to say that because a famous female athlete likes and claims to benefit from a particular sports shoe that everyone else will like and benefit from that shoe.

Part 2.

a. Teacher provides a mini text with negative example: "My cousin, Teck Wei, studied at JCU and he loved it. Therefore, I am sure to love JCU as well."
b. Students work alone and then consult partners to identify the error in the negative example and to rewrite the mini text to remediate the teacher-created negative

example. The unsupported generalization in the text is that because one person enjoyed studying at JCU that others will certainly also enjoy JCU. One way to rewrite the sentence is: "My cousin, Teck Wei, studied at JCU and he loved it. Since he and I both are interested in Psychology and enjoy doing group projects, maybe I will attend the JCU Open House next month to learn more about whether I should attend JCU. Also, I should ask more JCU students about their experiences." Note: in the remediated version, some evidence of commonalities between the two people is provided, and the writer is keeping an open mind while planning to gather more information.

Part 3.

a. Students work alone to create their own mini texts with negative examples of unsupported generalization, e.g., "My grandfather has smoked cigarettes since he was 14, but at age 92, he is still healthy and active. So, I don't believe all that anti-smoking propaganda."
b. Students exchange mini texts, identify the errors, and remediate the texts. The unsupported generalization is that just because one person has smoked for many years without apparent health problems does not mean the same will happen to others.
c. A remediated version of the text might be: "My grandfather has smoked cigarettes since he was 14, but at age 92, he is still healthy and active. That shows that although unhealthy behaviors increase risk, they do not guarantee disease."

Another Way To Teach Thinking Skills

The second author, T, teaches Introduction to Philosophy classes. Most of her students are second language users of English. The syllabus includes topics such as Right and Wrong (What is morally right or wrong?), Factory-Farmed Meat (Is it morally right for people to consume factory-farmed animal products?) and Rich and Poor (Do people have a moral obligation to assist those in dire need before spending on luxuries for themselves?).

T teaches logic, or thinking skills, in these classes not because they are on the syllabus; they are not. Rather, she teaches them because she wants to give students the opportunity to build a logic toolkit that will serve them in their undergraduate careers and beyond (Rex et al., 2010). For the purposes of, say, Late Medieval Literature and Culture or even Introductory Materials Science and Engineering, logic will equip students with the skill to build sound arguments in their essays or identify invalid ones in the scholarship. Moreover, for life, the toolkit will equip students with the ability to reason.

Students can harness this ability to secure a job or at least increase their employability (see Fisher and Tallant, 2016 for a discussion of the term). Employers and colleagues value this ability. According to Forbes, the no. 1 'most critical job skills to parlay in your job search for 2013' was 'using logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions or approaches to problems' (Casserly 2012).

They can also harness their ability to reason to benefit society. Students are 'bombarded by electronic media that discourage rational thought and encourage snap judgments based on prejudices and emotion' (Covel, 2010, p. 47). In knowing logic, they can identify 'sound bites [masquerading] as sound arguments' and distinguish between 'haranguing pundits and careful thinkers' (Rex et al., 2010, p. 56). In knowing logic, students can, say, denounce demagogues and be instrumental in preventing their election to office.

T promoted scaffolding of thinking skills via a three-part scaffolded procedure based on Covel's (2010) three Rs: revelation, relevance and reinforcement. [Note: for the purposes of this article, which is directed at teachers generally, some terms specific to philosophy have not been used.]

a. Revelation: Teacher introduces the thinking skills concept.
b. Relevance: Students do exercises using the concept and look for examples of the concept in a class reading.
c. Reinforcement: The class, including the teacher, discuss the use of the concept in the class reading, and in subsequent readings and other assignments.

Example Activity 3 - Thinking Skill: Using counterexamples

a. Revelation: Teacher explained that a counterexample is an argument with the same structure as another but with obviously true premises and an obviously false conclusion. (To be clear, an argument is a set of one or more premises and one and only one conclusion; a premise is a statement (true or false) arguers make in support of a conclusion; and a conclusion is a statement (true or false) arguers try to prove.) Counterexamples serve to show that an argument is invalid (bad!), i.e., the truth of the premises does not guarantee the truth of the conclusion. Sometimes, it is not obvious that arguments are invalid. Counterexamples help reveal an argument's invalid nature. Consider the following argument:

    (P1) If the light is on, then the neighbors are in.
    (P2) It is not the case that the light is on.
    (C) Therefore, it is not the case that the neighbors are in.

    The argument is invalid. To show that the argument is flawed, first, we need to identify its form. Replacing 'the light is on' with *A* and 'the neighbors are in' with *B*, we see that the argument has the following form:

    (P1) If *A*, then *B*.
    (P2) It is not the case that *A*.
    (C) Therefore, it is not the case that *B*.

    Next, we need to replace the *A*s and *B*s with other sentences which make the premises (P1) and (P2) obviously true and the conclusion (C) obviously false, e.g., *A* with 'Donald Trump was born in California' and *B* with 'Donald Trump can be US president'. This gives us:

    (P1) If Donald Trump was born in California, then Donald Trump can be US president.
    (P2) It is not the case that Donald Trump was born in California.
    (C) Therefore, it is not the case that Donald Trump can be US president.

    This counterexample shows that the original neighbors argument is invalid. Here, (P1) is true. According to the US Constitution (Sec. 1, Art. 2, Cl. 5), if a person is born in the USA, then they are eligible to be president. Likewise, (P2) is also true. Donald Trump was born in – not California but – New York. However, (C) is false. Not only *can* Donald Trump be president, but he took the oath of office on 20 January 2017. Moreover, the Trump argument has exactly the same structure as the neighbors argument yet has obviously true premises and an obviously false conclusion.
b. Relevance: To check students' understanding of the thinking skill of using counterexamples, teacher invited students to work in groups of four to create a counterexample to the following (invalid) argument:

    (P1) If you wear jeans, then you are cool.
    (P2) You are cool.

(C) Therefore, you wear jeans.

Then, teacher invited students to identify a counterexample in the week's class reading: Norcross's article 'Puppies, pigs, and people' (2004). Norcross offered a counterexample to the meat eaters' argument. The meat eater's argument was the following:

(P1) Animals are not as cognitively sophisticated as humans.

(C) Therefore, it is morally permissible for humans to eat animals.

As Norcross pointed out with a counterexample, the meat eater's argument was clearly invalid. It could have all true premises (or in this case its only premise could be true) and a false conclusion. Replacing 'animals' with *A* and 'humans' with *B*, we see that the argument had the following form:

(P1) *A* is not as cognitively sophisticated as *B*.

(C) Therefore, it is morally permissible for *A* to eat *B*.

Letting *A* be 'a baby' and *B* be 'an adult,' we get:

(P1) A baby is not as cognitively sophisticated as an adult.

(C) Therefore, it is morally permissible for an adult to eat a baby.

This argument has the same form as the meat eater's argument and has an obviously true premise (P1) and an obviously false conclusion (C).

c. Reinforcement: In subsequent classes and on subsequent assignments, the class identified or created counterexamples.

Example Activity 4 - Thinking Skill: Identifying assumptions

a. Revelation: Teacher explained that an assumption is a statement speakers or arguers accept as true. Sometimes, they explicitly mention the assumptions they are making; sometimes they do not.

b. Relevance: Students collaborated with their group members on the following exercises.

Fill in the blanks:

i. A: 'I heard the Prime Minister of the UK deliver a speech.'
B: 'Oh! What did he say?'

B assumes that -
_____.

ii. C: Where is Hui Li?
D: She is either in UTown or at the Central Library.'

D assumes that -
_____.

iii. E [to F]: 'Hi! I made you chicken rice for supper. I reckoned you were not a vegetarian or vegan.'

E assumes that -
_____.

As students worked out, B (covertly) assumes that the Prime Minister of the UK is a man; D (covertly again) assumes that Hui Li is a woman in one of exactly two places; and E (overtly) assumes that F eats meat.

Then, teacher invited students to use the thinking skill of identifying assumptions to consider what assumptions, explicit or implicit, one could find in the reading for the week: Peter Singer's article 'Famine, affluence, and morality' (1972).
c. Reinforcement: Teacher led a discussion on the assumptions in the reading. Students and teacher continued to highlight assumptions in readings and assignments as the term progressed.

Promoting Effective Student-Student Interaction for Building Thinking Skills

Four often overlapping ways in which learning, including learning of thinking skills, takes place in second language classrooms (brick and mortar, as well as virtual) are: (1) students receive ideas and information from teachers and materials, e.g., videos; (2) students study on their own; (3) students participate in teacher-led discussions (although often teachers dominate these discussions); and (4) students interact with others, principally their classmates. This fourth form of learning has been receiving more attention from educators and more classroom time in recent years, and, indeed, the zeitgeist in education and many other fields has shifted to emphasize the social, especially peer, interaction. This shift is seen in such concepts as social cognition, the social construction of knowledge, communities of practice, and academic discourse communities.

This understanding of the social / community aspect of learning has given rise to a large body of generic strategies through which educators can facilitate student-student collaboration in many different contexts, regardless of students' ages, levels of achievement, or subject areas. Furthermore, these strategies find support in theory, research, and classroom practice, and go by such names as collaborative learning and cooperative learning (CL) (McCafferty, Jacobs, & Iddings, 2006; Magee & Jacobs, 2001; Yim & Warschauer, 2017). Below are descriptions and explanations of two CL techniques for the learning of thinking skills, as well as other skills and any content.

Everyone Can Explain

Students do Everyone Can Explain in groups of two-four members. Two aspects of this CL technique deserve mention. Firstly, students need to go beyond sharing answers to being able to explain answers. Secondly, the last step highlights that everyone in a group, not just a group leader or representative, needs to be able to do that explaining. Here are the steps.

1. Teacher asks a question or gives a task.
2. Students initially work alone to generate responses.
3. The group works together to develop a collective response with explanation.
4. Teacher calls a number at random, and the group member with that number may be asked to give and explain their group's response.

A variation on Everyone Can Explain is Everyone Can Explain Mobile, which has nothing necessarily to do with mobile phones (although students can use them to facilitate cooperation). The variation involves Step 4 in the technique. Instead of only one student at a time addressing the class, the group member whose number is called changes places with the similarly-numbered member of another group. These mobile members give and explain their group's response to their host group, who provide feedback, which the mobile members later report, upon returning to their home group.

Write-Pair-Square

Students normally do Write-Pair-Square in groups of four, just as a square has four sides. Similar to Everyone Can Explain Mobile, Write-Pair-Square increases the amount of interaction among students, compared to one group member reporting to the entire class. Of course, while students are interacting, teachers are not drifting off for another cup of coffee or catching up on their marking (tempting as both of those actions might be). Instead, teachers are circulating among the groups monitoring and facilitating students' understanding. Here are the steps in Write-Pair-Square.

1. In the Write step, students work alone to formulate responses. This time set aside for students to write decreases the chances of less vocal students being drowned out by more vocal peers, and promotes individual accountability among groups, i.e., the pressure on students to do their fair share of the group activity.
2. In the Pair step, students form twosomes who check each other's responses and, perhaps, develop an improved response.
3. In the Square step, the two pairs in a foursome (a square has four sides) come together and discuss their responses.

Conclusion

It has become commonplace to recite statistics and predictions about the increasing speed at which knowledge becomes obsolete and, correspondingly, the increasing importance of developing thinking skills. Are these thinking skills learned inductively as part of life experiences and content learning? Yes, they are, to some extent. However, this article has claimed that thinking skills are crucial to the futures of students and the societies in which they live, and given the crucial nature of thinking skills, teachers – including teachers of second languages – must promote explicit learning of thinking skills. Toward that end, the article has offered paths that second language students can take as they develop their thinking skills. These paths were illustrated with examples from four lessons, two on writing and two in philosophy. Last, but not least, as their students increase their understanding and application of thinking skills, so too should their teachers, in order to better be able to join their students in using thinking skills to promote learning and to address the challenges we all face as citizens of our planet.

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