Late immersion: Contrasting content-trained teachers' and language-trained teachers' pedagogies

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Overview

1. The late immersion context
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1. The late immersion context

- Immersion: Teaching content subjects through an L2 to lead to content + language learning
- Content-language integrated learning
- Late immersion: Subject specialism
- Late immersion teacher education: content- or language-trained

2. Aim of study

To investigate the classroom discourse of content-trained and language-trained late immersion teachers to find out what pedagogies support content-language integrated learning

3. Contexts of study

Hong Kong

- Late immersion: 25% (n=114) top ranking secondary schools
- L1 Chinese teachers teaching L1 Chinese students a content subject through English
- Most subjects, taught by content-trained teachers
- Class size = 40

Xi'an

- CCUCEI project: 18 kindergarten, 13 primary schools, 3 middle schools
- L1 Chinese teachers teaching L1 Chinese students a content subject through English
- One subject outside curriculum, taught by language-trained teachers
- Class size = 50-60

4. Data source

- **Lesson 1:** Grade 8 science on 'Structure and functions of the eye' (Hong Kong)
- **Lesson 2:** Grade 9 geography on 'Effects of scientific farming methods' (Hong Kong)
- **Lesson 3:** Grade 8 science on 'Fire triangle and its application to putting out a fire' (Xi'an)
- **Lesson 4:** Grade 8 science on 'Functions of the eye' (Xi'an)

Content-driven ← ---------- → Language-driven
Lesson 1 Lesson 4

5. Classroom discourse features for analysis

1. lesson structure
2. content-focused talk: complexity of content and knowledge relationships
3. language-focused talk: form-function integration
4. teacher-student interaction
   - teacher questioning
   - student-student interaction tasks

6. Findings: Lesson structure

Content-trained teachers: Cyclical lesson structure

- Very few learning objectives
- Multiple opportunities to revisit and co-construct knowledge relationships

Language-trained teachers: Linear lesson structure

- A list of unrelated facts as learning objectives
- Little revisiting or co-construction of knowledge relationships

6. Findings: Lesson structure

Lesson 1

1. Teacher stating the topic of the lesson
2. Teacher explanation of how the structure of the eye functions to help us see in different light conditions
3. Teacher instruction on how to dissect an ox eye
4. Students dissecting an ox eye in groups
5. Teacher rounding off the practical work and instructing students to finish an exercise on the dissected eye
6. Students working on the exercise

Lesson 4

1. Teacher asking what students can see and what they cannot see without eyes to introduce the topic
2. Teacher brief explanation of how our eyes see
3. Group discussion on why two eyes are better than one, followed by teacher-led sharing
4. Teacher demonstrating how two eyes are better than one using a bottle of water
5. Teacher explanation of the functions of tear glands and blinking, and the causes of short-sightedness
6. Group discussion on the causes of short-sightedness, followed by teacher-led sharing
7. Role play of a news reporter interviewing 2 other students on how they protect their eyes from short-sightedness
8. Group work on writing on the petals of a flower ways to protect our eyes
9. Students sharing ideas on how we can protect our eyes
10. Setting homework: each student draws a poster about how to protect our eyes

6. Findings: Content complexity

Yes, the pupil is used to admit light into the eye. And in fact pupil is nothing but a hole. This is not an object. In fact, it is a hole. However, the size of a pupil can be changed by the iris. In different situations, under different conditions, the size of a pupil can be adjusted by the iris. And in fact the iris will change the size of the pupil depending on the lighting condition. Under very bright condition, when there when there is bright light around, the iris will move to make the pupil smaller. And when we are looking [sic] things under dark condition, the iris will move to make the hole larger to make the pupil larger. So more light can enter the eye, OK? Na, this kind of adjustment is part of the accommodation. OK? (Drawing the focusing muscles and lens on the partially drawn diagram of an eye) After passing through the pupil, the light ray will meet another structure. This is the focusing muscle and this is the lens. Don't forget to put 's' at the end of this word. This is important. Don't say 'len'. Lens. But the lens is used to focus object. When light enters the eye, the lens help to change, help to focus all the objects into a single point on the retina which is the back of the eye. (Drawing light rays entering the eye on the diagram) Again the lens can be adjusted. In fact, the thickness of the lens can be adjusted by the movement of the focusing muscles. When we are looking [sic] objects from different distances, the lens, the thickness of the lens will be changed. If we are going to look at far objects, the lens will become thinner by the movement of the focusing muscle and when we are looking at a near object, the lens will become thicker, will become thicker to focus the object, to get a good image of it. It is another kind of adjustment in the eye. And again part of the accommodation of the eye. So that our eye can see under bright or dark condition. We can see things from far or near distances. …

T: So how do our eyes see? How do our eyes see things? Now let me tell you, OK? (Showing Powerpoint with the diagram of the cross section of an eye and a flower at a distance from the eye) this … (Pointing at the flower)
Ss: Flower.
T: The light, comes through your eyes. Light comes through your eyes, and get to come to the back of your eye. The flower comes through your eye and get to the back of your eye. OK?
Ss: Yes.
T: And then, what's that? (Pointing at the brain in the diagram)
Ss: Brain.
T: Brain, right, so your brain, your brain … gets the message, your brain knows you see something, so the brain tells you oh a flower, it's a red flower. So this one is the pupil. (Pointing at the pupil in the diagram)
Ss: Pupil.
T: So what colour is your pupil?
Ss: Black.
T: Yes, the black part of our eyes. And then this is the lens. (Pointing at the lens in the diagram)
Ss: Lens.
T: Like a mirror right? It's like a mirror. And then the back of your eye is called retina.
Ss: Retina.
T: And this is your brain.
Ss: Brain.
T: Now you know how you see things.
Ss: Yes.

6. Findings: Complex content → complex language

Yes, the pupil is used to admit light into the eye. And in fact pupil is nothing but a hole. This is not an object. In fact, it is a hole. However, (1) the size of a pupil can be changed by the iris. In different situations, under different conditions, the size of a pupil can be adjusted by the iris. And in fact the iris will change the size of the pupil (2) depending on the lighting condition. Under very bright condition, when there (3) when there is bright light around, the iris will move to make the pupil smaller. And when we are looking [sic] things under dark condition, the iris will move (4) to make the hole larger to make the pupil larger. So more light can enter the eye, OK? Na, this kind of adjustment is part of the accommodation. OK? (Drawing the focusing muscles and lens on the partially drawn diagram of an eye) After passing through the pupil, the light ray will meet another structure. This is the focusing muscle and this is the lens. Don't forget to put 's' at the end of this word. This is important. Don't say 'len'. Lens. But the lens is used to focus object. When light enters the eye, the lens help to change, help to focus all the objects into (5) a single point on the retina which is the back of the eye. (Drawing light rays entering the eye on the diagram) Again the lens can be adjusted. In fact, (6) the thickness of the lens can be adjusted by (6) the movement of the focusing muscles. When we are looking [sic] objects from different distances, the lens, the thickness of the lens will be changed. If we are going to look at far objects, the lens will become thinner by the movement of the focusing muscle and when we are looking at a near object, the lens will become thicker, will become thicker to focus the object, to get a good image of it. It is another kind of adjustment in the eye. And again part of the accommodation of the eye. So that our eye can see under bright or dark condition. We can see things from far or near distances. …

1. the passive voice to put in the 'theme' position the topic in focus (*the size of a pupil*);
2. a participle phrase to provide more information;
3. a when-clause to explain a cause-effect relationship;
4. an infinitive phrase to describe purpose;
5. a long noun phrase with postmodification of prepositional phrases and relative clauses to provide detailed information;
6. nominalised phrases to represent a concept and to allow the concept to be further explained and developed;
7. subject-specific words (e.g. *accommodation*, *iris*, *pupil*, *lens*, *retina*, *optic nerve*, *light sensitive cells*).

6. Findings: Content complexity and knowledge relationships

- Complex content → complex language
- Teacher monologue → coherent conceptual networks and sustained syntactically complex oral input
- Knowledge relationships
  - Cause-effect, comparison, definition (the accommodation of the eye, Lesson 1)
  - Cause-effect, problem-solution (effects and solutions for scientific farming, Lesson 2)
  - Cause-effect, hypothesis (fire triangle and its application to putting out fire, Lesson 3)
  - Description (of several facts related to the eye, Lesson 4)

6. Findings: Form-function integration

- Teachers' explicit and consistent use of the language of the content → students' use of the language e.g.
  the language of cause-effect in Lesson 2
  the language of hypothesis in Lesson 3
- Teachers' awareness of the form-function relationships and advanced planning of specific language form(s) for the function(s) of the content
- Knowledge relationships: content ↔ language

6. Findings: Form-function integration

Lesson 2: The language of cause-effect

- How would a scientific farming method lead to environmental pollution? [Turn 5, Lines 18-19]
- How can we describe, how can the methods leads to [sic] environmental pollution? [Turn 5, Lines 20-21]
- But please remember when you try to write these in the… in your answers, you need to use "therefore", and use complete sentence [sic], or you can say "result in" or "lead to" in order to link the several phrases together. [Turn 19, Lines 38-40]
- We learned 'harmful to ecology', can you still remember how the use of scientific farming methods create or lead to a harmful ecology? [Turn 19, Lines 41-42]
- How did scientific farming methods lead to soil erosion? [Turn 36, Line 65]
- … now we go to point number four, unemployment. Open your book to 90 [sic] (Students opening their book). A scientific farming method may lead to unemployment. [Turn 40, Lines 72-73]
- Mechanization in farming needs less labour, therefore this may lead to unemployment of farm workers, especially in South China (Students read the sentence aloud together). [Turn 43, Lines 78-79]
- The mechanization needs less labour and finally leads to unemployment. [Turn 54, Line 102]
- Very good. Very good of you to use "lead to", mechanization, you can say a higher level of mechanization leads to fewer or…. leads to less need of labour. Less need of labour, and therefore result in [sic] unemployment. [Turn 55, Lines 103-105]

6. Findings: Form-function integration

Lesson 3: The language of hypothesis

T: And now (Clicking the Powerpoint that shows the language form) now (Picking up some wooden splint) if I light…light this splint and put this into this so-called empty tube right, what will happen to this splint? What will happen? Just make a guess.
Ss: (Whispering)
T: Yes…Do you have any idea?...XXX (Calling a student name) please.
S1: …the test tube will still burn.
T: Still burning and…
S1: And…
T: What happen, what will happen later?
S1: Later maybe…The fire will be put out.
T: The fire will be put out. OK, maybe… a guess, right? Any other guesses?... No. OK. Now let's do the experiment. [Turns 57-65, Lines 80-93]

6. Findings: Form-function integration

Lesson 3: The language of hypothesis [cont'd]

T: Please look at the screen. Now, if we put the burning splint into the tube filled with normal air, just now we have done the experiment, it will …go out (saying it at the same time as the students), right?
Ss: go out [Turn 79-80, Lines 118-121]

T: (Clicking to show the Powerpoint slide) Look at this. If we put the glowing splint into a tube filled with oxygen, right?
Ss: Yes.
T: It will burn again. [Turns 97-99, Lines 146-149]

T: (Showing the question on the Powerpoint) Will a fire happen if there is only oxygen?
Ss: No. [Turn 107-108, Lines 159-161]

T: I'd like one student to tell us the answer. XXX (Calling a name)
S2: There…if…if…if…there will…er...there will no fire if there is no heat.
T: No heat, right?
S2: There will be no fire if there is no heat. [Turns 166-169, Lines 229-232]

6. Findings: Teacher-student interaction
Teacher questioning

Teacher questioning → better quality teacher-student interaction

T: Now, what happened just now? What happened with the splint?
Ss: (Noises)
T: The…splint…stopped burning, right?
Ss: Stopped burning.
T: OK. Why? Why it stopped burning? Why? OK (Inviting a student to answer).
S3: Because there is not enough oxygen in this test tube.
T: In this test tube…there is not enough oxygen, right? OK. There is not enough oxygen there also means…oxygen is…
…
T: Oxygen in this test tube is very limited, right? Now think about the relationship between this (Holding the test tube and the wooden splint) burning…burning splint and the oxygen. …There is…not enough oxygen, right? Why? Why there is not enough oxygen, the fire stops burning? The fire stopped. (Inviting a student) OK.
S5: Burning need oxygen.
T: Burning needs oxygen. Good. [Lesson 3, Turns 67-79, Lines, 98-117]

6. Findings: Teacher-student interaction
Student-student interaction tasks

Lesson 3: Task (Discussion of how to put out a fire under different conditions using knowledge of the fire triangle) → better quality teacher-student interaction

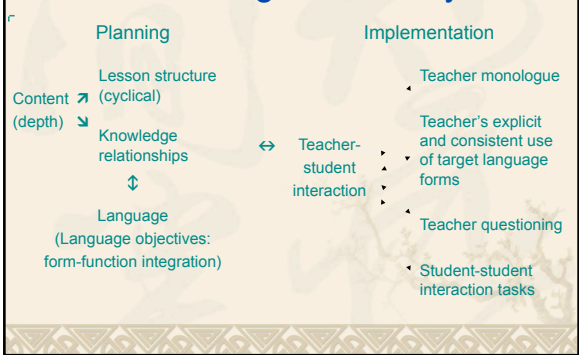
T: Why does the person cover the wok with a lid when the wok is on fire?
S6: Because when the person cover the wok with a lid it will remove the oxygen because if there is no oxygen, there will be no fire.
T: There is no oxygen, there will be no fire. Right?
…
T: The waste paper in the rubbish bin is burning. How would you put out the fire?
S7: I think we can put the rubbish basket upside down…there will not be enough oxygen for the fire running and then the fire will be put out.
T: OK. Put the bin upside down, right? There is not enough oxygen, right? So there will be no fire. OK, you (Inviting a student).
…
S8: I don't agree because if we put the rubbish bin upside down the fire will destroy the rubbish bin. [Turns 267-297, Lines 388-427]

6. Findings: Teacher-student interaction Student-student interaction tasks

Lesson 4: Task (Discussion on how to protect our eyes relying on students' own knowledge)

S1: [Student reading what they have written] We can have a good rest and often see plants. Don't play computer for a long time, ah do eyes exercise, eat many vegetables, don't read in the sun, the last one is don't watch TV for a long time.
T: Thanks a lot, another group? …
S2: ah eye exercise, don't read in the sun, don't read on the bus, ah watch more flowers and trees.
T: Thank you. OK, next.
S3: Don't watch TV for a very long time and don't read under the sun. We … we should do exercise, eye exercises every day, and often have a rest is very important. And don't play computer for too long.
T: OK. Thank you. [Turns 157-162, Lines 250-259]

6. Findings: Summary



7. Implications

- Content: Depth of content → complex language
- Teachers' awareness of form-function relationships → content-language pedagogies