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Standing Committee on Language Education
and Research (SCOLAR)
Research and Development Project
Dissemination Conference

**Informing Pedagogy through Exploring &
Reforming Assessment Practices in EMI
Education**

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Outline

- (I) Research gap in EMI: Assessments
- (II) Analysis of cognitive and linguistic demands of EMI assessments
- (III) Whether and how EMI teachers prepare their students for EMI assessments



English as the medium of instruction (EMI) vs Content & Language Integrated Learning (CLIL)

- ▶ Learning non-language content subjects through a second/foreign language (L2)
- CLIL is used as an umbrella term for different variants (Cenoz et al., 2014)
- EMI as a variant of CLIL
- ▶ “Dual goal”: the learning of L2 AND academic achievement



Previous research

- ▶ “Product-oriented” research on students’ achievement
 - ▶ But it shows that “dual goal” is NOT guaranteed
e.g. Lo & Lo’s (2014) meta-analysis: EMI students enjoyed some advantages in L2 (English) learning, at the expense of their achievement in such content subjects as Science and History

 - ▶ Possible reasons?
 - “Process-oriented” research on classroom interaction & discourse (e.g. Lo & Macaro, 2012; Ng et al., 2001)
 - Limited interaction & “space of learning” in EMI classrooms
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Research gap: Assessment in EMI

- ▶ *‘Assessment has so far been something of a blind spot in many CLIL programmes’* (Massler et al., 2014, p. 138)
- ▶ Why is it important?
 - “Backwash” effect (Alderson & Wall, 1993): the influence of assessment on teaching and learning behaviours
 - assessment practices in EMI will in turn affect teachers’ pedagogical practices and students’ learning behaviours
 - In some EMI contexts, students are affected by the high-stakes examination



(I) The complexity of EMI assessments

- ▶ Basic element of assessment and testing: “validity”
 - whether the test score can accurately reflect a student’s level of knowledge, skills or competencies which the test is intended to measure (Hughes, 2003; Shaw & Imam, 2013).
 - Only then can the test score be appropriately interpreted and used (Kane, 2006)

- ▶ “Validity” in EMI assessments = whether assessment in EMI measures what it targets and whether assessment can reasonably reflect students’ actual learning



1. Role of language in assessment


- ▶ Assessing students' knowledge and skills involved in non-language content subjects in EMI
- ▶ Students are assessed through their less proficient L2
- ▶ Students perform higher-order thinking skills in their L1 (Cohen, 1993; Luk & Lin, 2015)
- ▶ Students could better express their content knowledge in their L1 (Gablasova, 2014)
- Assessment in EMI may not accurately reflect students' actual knowledge in content subjects



2. Teachers' beliefs & practices in CLIL/EMI assessments

- ▶ A fundamental question to ask: “*What to assess?*” (Short, 1993; Coyle et al., 2010)
- ▶ Should we assess content or language, or both?
- ▶ Theoretically speaking, both content and language **SHOULD** be assessed as they are the dual goals in CLIL (Massler et al., 2014)
- ▶ In real practice, ‘the content curriculum dictates the parameters for assessment’ (Hönig, 2009, p. 26)



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- ▶ CLIL/EMI content subject teachers do not **think** they target both when they design the assessment tasks and marking rubrics (Hönig, 2009; Massler et al., 2014)
 - ▶ YET, when they marked students' assessments, L2 proficiency did play an important role in those teachers' grading
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“The difficulty with assessment centres on isolating the language features from the content objectives so one does not adversely influence the other’ (Short, 1993, p. 627).

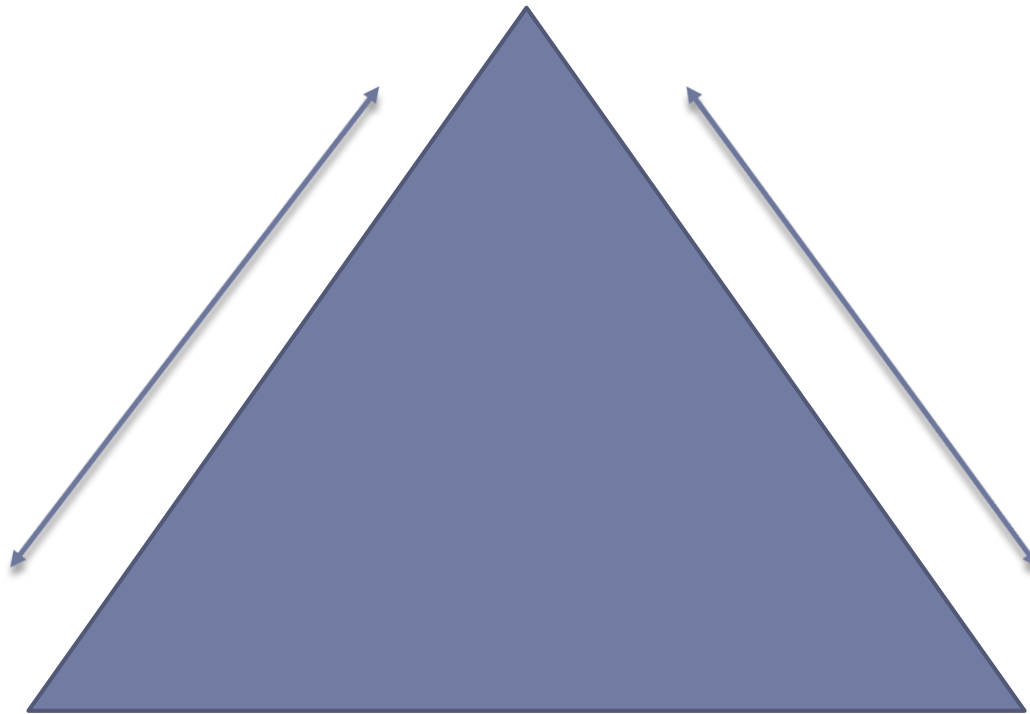
Is it possible to do so?

- ▶ It may be very difficult to separate content from language, but it is still possible for teachers to place more emphasis or weight on either content or language (Massler et al., 2014)
- ▶ To what extent are current assessment practices doing this?



3. Objectives, Instruction & Assessment

Goals/ Objectives:
What do we want our
students to learn?



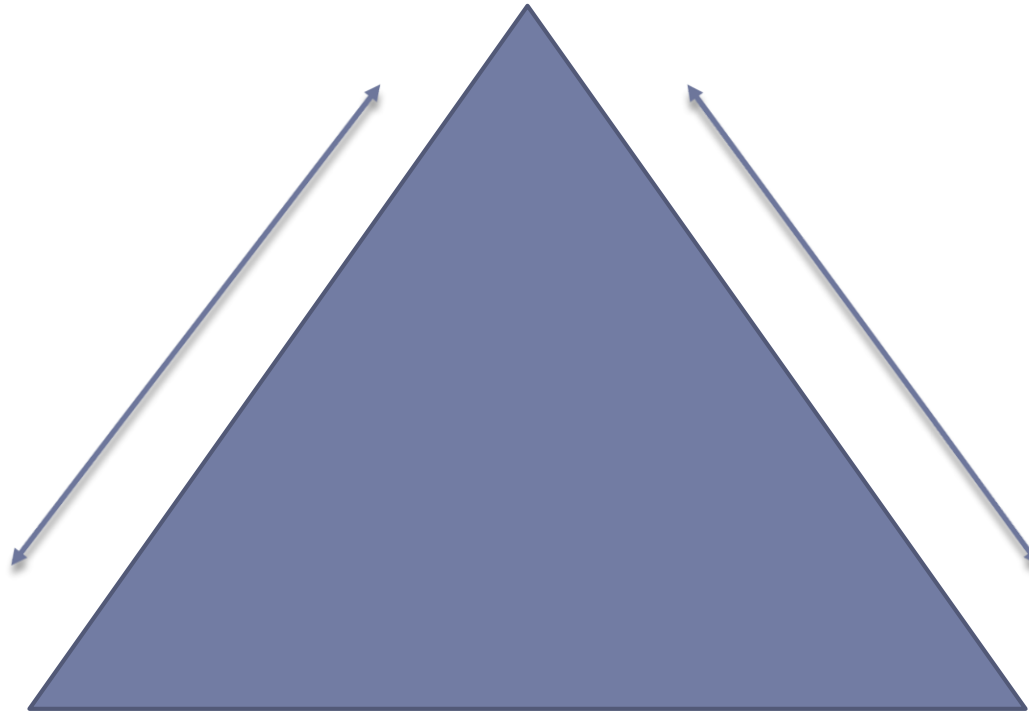
Instruction:
What will help students
learn?

Assessment:
How will we know that
students have learned?



Objectives, Instruction & Assessment in EMI

Goals/ Objectives:
Content AND Language
learning



Instruction:
“Counterbalancing”/
“Integrating” content and
language

Assessment:
Cognitive and Language
dimensions





In real practice ...

- ▶ Content subject teachers in EMI put more emphasis on teaching content (Walker, 2011; Tan, 2011)
 - ▶ their lack of language awareness (Hoare, 2003; Lo, 2014; Trent, 2010)
 - ▶ lack of language teaching pedagogy (Koopman et al., 2014)
- To what extent and how do EMI content subject teachers prepare students for the cognitive and linguistic demands in assessments?



(III) The current project on EMI assessments

▶ Research questions:

1. How valid are current assessment practices in EMI, in terms of assessing students' content and language learning?  Stage 1
2. To what extent do classroom practices align with assessment in EMI programmes?  Stage 2



Stage 1: Analysis of current assessment practices

- ▶ Aim: to survey the current assessment practices in the EMI education in Hong Kong.
- ▶ Focusing on Biology, because
 - the subject is offered by over 95% of secondary schools in Hong Kong (HKEAA, 2017)
 - it is found across different stages in the secondary school curriculum (including both junior and senior levels)
 - it is perceived to be more “language demanding” among science subjects



Data collection

▶ Sources of data :

1. Questions from a set of **junior secondary Science** textbook/workbook, totalling 2491 questions
→ junior form; formative assessments
2. Questions from a set of **senior secondary Biology** textbook/workbook, totalling 1617 questions
→ senior form; formative assessments
3. Questions from **HKDSE Biology** papers between 2012 and 2015, totalling 387 questions
→ senior form, summative assessments

Comparison across different grade levels & types of assessment

Data analysis

- ▶ Based on a modified analytical framework (Lo & Lin, 2014)
- ▶ The unit of analysis was one question (or one part of multiple-part questions)
- ▶ Inter-coder reliability established (>90%)

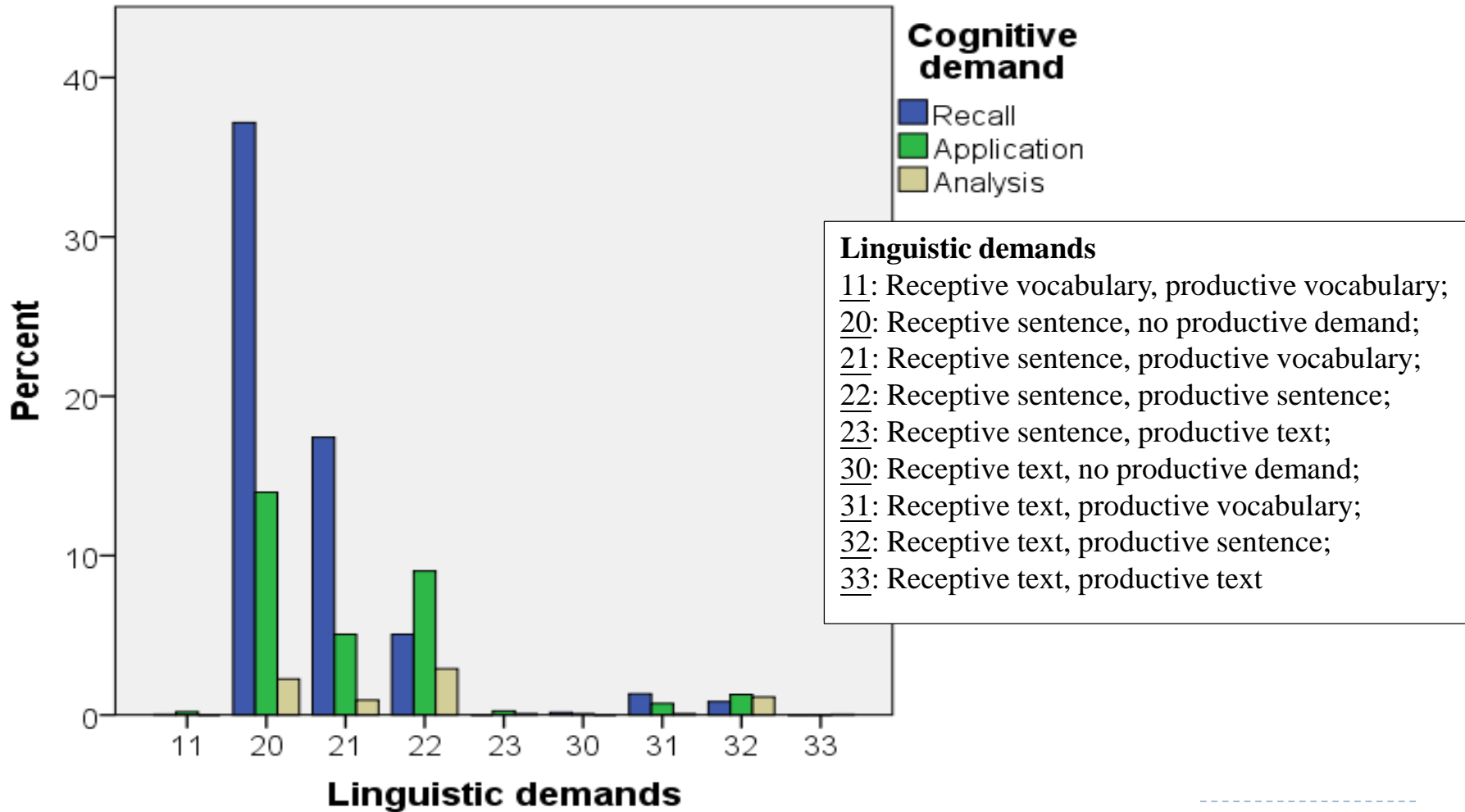


Analytical framework: Lo & Fung (2018)

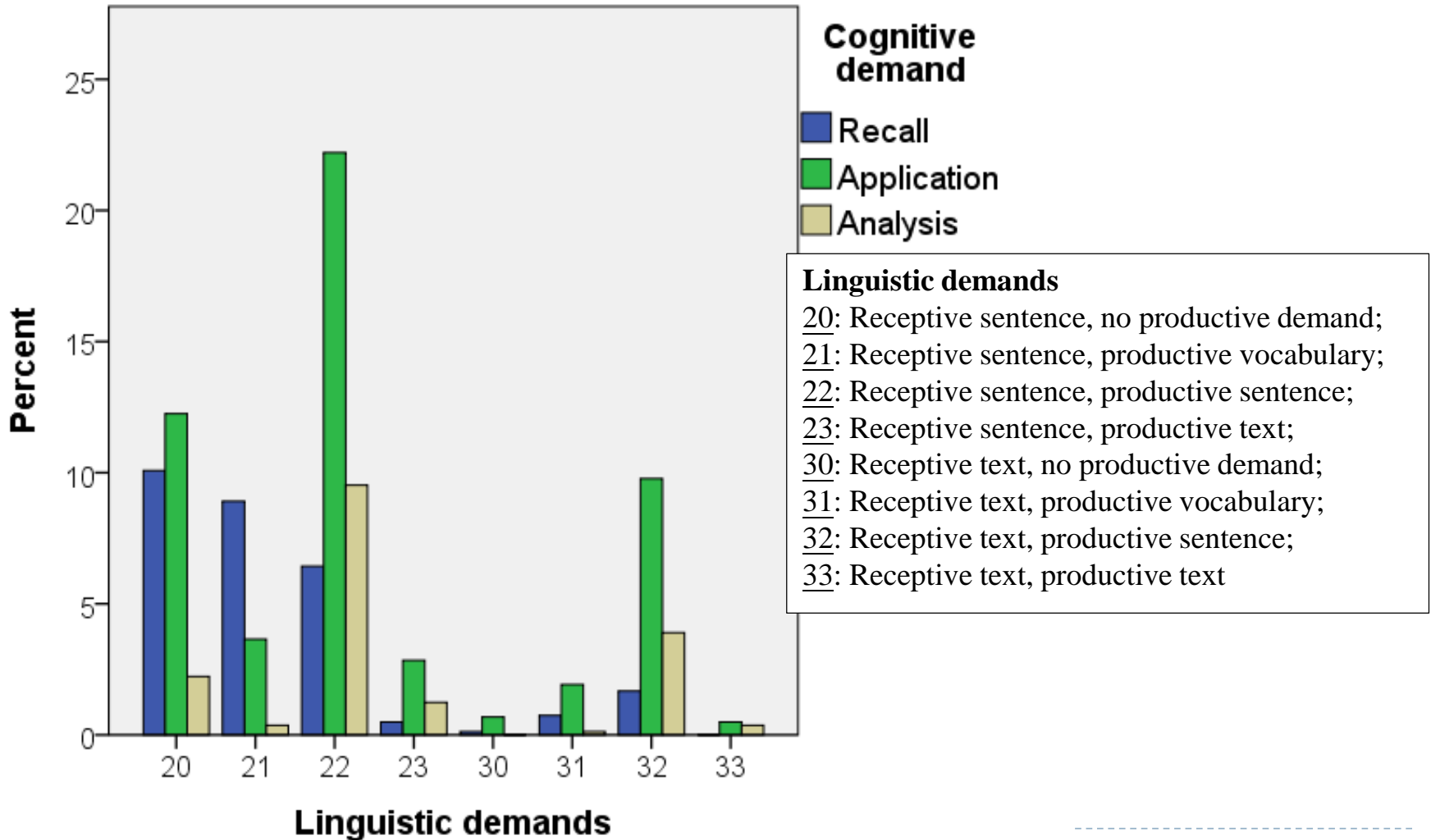
Linguistic\Cognitive demand		Recall	Application	Analysis
Receptive vocabulary	No productive demand			
	Productive vocabulary			
	Productive sentence			
	Productive text			
Receptive sentence	No productive demand			
	Productive vocabulary			
	Productive sentence			
	Productive text			
Receptive text	No productive demand			
	Productive vocabulary			
	Productive sentence			
	Productive text			



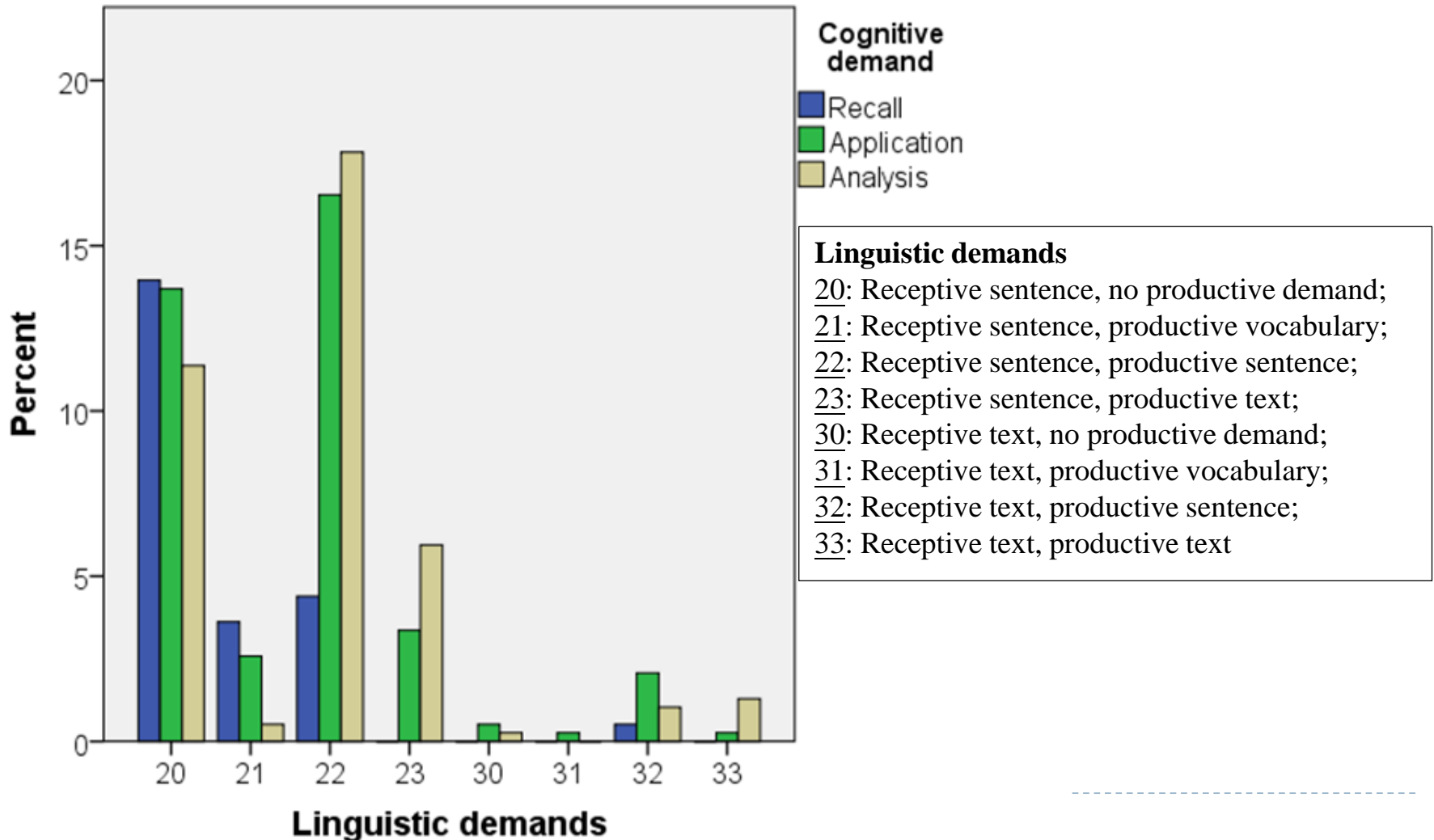
Results: Analysis of junior Science textbooks



Results: Analysis of senior Biology textbooks



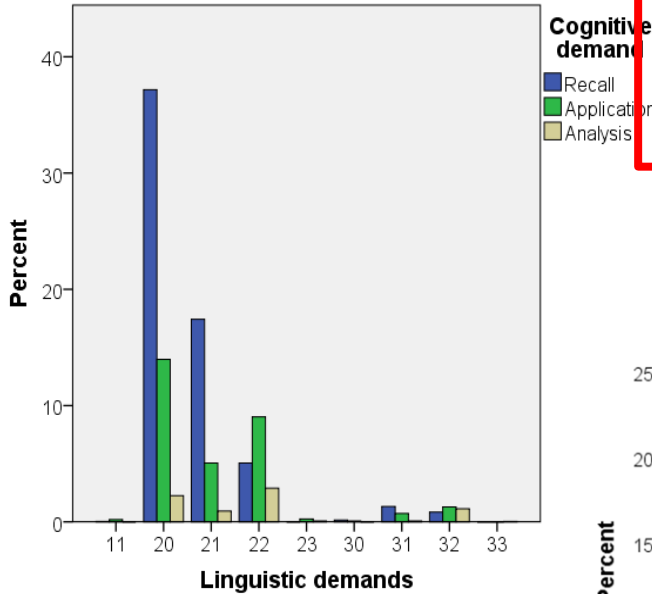
Results: Analysis of senior Biology HKDSE papers



SI-S3 Science

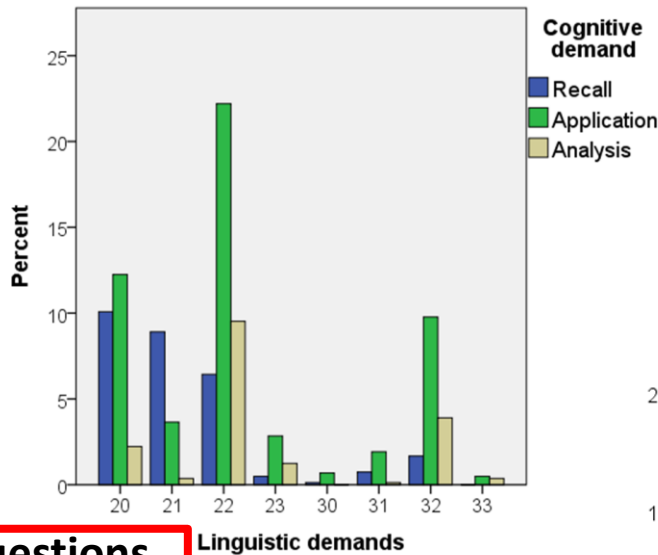
S4-S6 significantly more questions requiring *application and analysis*, and sentence and text production

Are students prepared cognitively and linguistically?



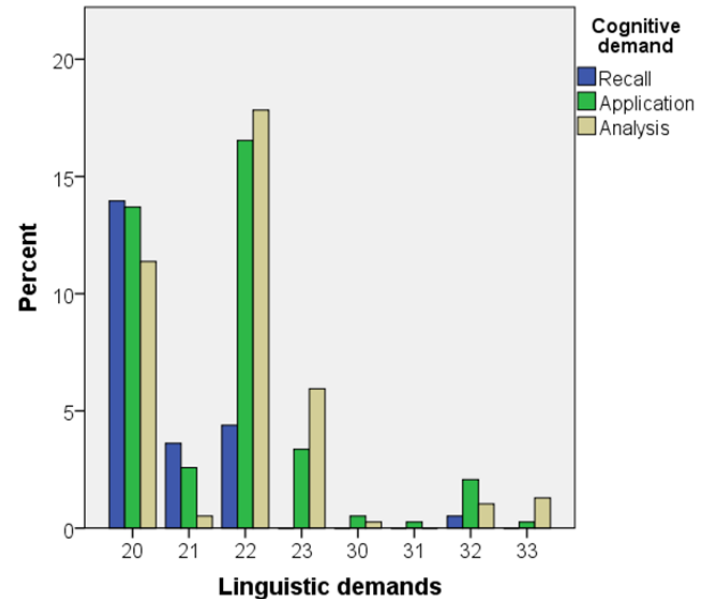
S4-S6 Biology

HKDSE significantly more questions requiring *analysis* and text production



HKDSE Biology

HKDSE significantly more questions requiring *application and analysis*, and sentence and text production



Any progression? A big leap?

Stage 2: Investigation of EMI teachers' objectives, instruction & assessment

- ▶ Aim: to examine how objectives, classroom practices and assessment may interact or affect each other in particular EMI school contexts

 - ▶ Methodology
 - Multi-case study
 - Six teachers teaching Science or Biology at junior or senior secondary levels were recruited as cases
 - From schools in different districts, with students of different ability levels
 - More interesting insights from cross-case comparison
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Data collection

1. Lesson observations for one teaching unit/ topic (around 4-6 lessons), together with researchers' field notes + pre-observation meeting + post-observation debriefing
 2. Formative and summative assessment tasks (e.g. homework, quiz, formal tests/examinations), together with the marking rubrics used for the observed unit
 3. Randomly selected sample of marked scripts of the assessment tasks
 4. Semi-structured interviews with teachers and their students (3-4 from each class)
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Data analysis

1. Transcribed lessons (and pre-, post-observation meeting) were analysed with a coding framework (see next slide) to examine the attention paid to content and language
2. Questions in the assessment tasks analysed according to Lo & Fung's framework
3. Students' performance and teachers' grading practices shown in the marked scripts were analysed
4. Semi-structured interviews with teachers and their students were transcribed and analysed to explicate and/or triangulate other sources of data



Coding framework of observed lessons

(I) Lesson structure and focus

Major Theme	Sub Theme		Definition
Instructional Register	Content	Recall	Teaching/ summarisation/ overview of content knowledge or information which can be obtained through memorisation;
		Application	Teaching of ways to apply content knowledge; involves deeper understanding of content knowledge, and students' higher order thinking
		Analysis	Teaching/ demonstration of analytical techniques; involves the highest level of thinking and students' critical thinking/creativity/meta-cognition
	Language	Lexico-grammar	Teaching of content-related language at the lexical level (i.e. explaining the meaning of a vocab/word) and grammar items
		Sentence	Teaching of content-related language at the sentence level; teaching or demonstration of sentence constructions, etc
		Text	Teaching content-related language at paragraph level; teaching or demonstration of model writing and/or writing structure
Regulative Register	Task Management		Content subject related but not teaching related act i.e. assigning assessments, facilitating group discussions, etc
	Behaviour Management		Non content subject related acts i.e. greetings, general classroom management, etc



(II) Teacher-student interaction

Major Theme	Sub Theme		Definition
Oral Formative Assessment	Content	Recall	Mainly in question form. The main purpose is to recall information; usually realised by what, yes/no question, choices
		Application	Mainly in question form involving reasoning or explanation; Part of the purpose mostly realised by Why and How questions.
		Analysis	Usually realised by keyword like compare or evaluate. The main purpose is to facilitate students' higher order thinking.
	Language	Vocabulary	The main purpose is to access students' understanding on the meaning and the usage of the key vocabulary.
		Sentence	The main purpose is to ensure students are familiar with subject-specific sentence pattern.
		Text	The major purpose is to ensure students have a correct understanding of the structure or the purpose subject-specific writing.
	Re-elicitation question (Re.Q.)		Questions asked when there is no response to the original question. It can be further divided into two categories: Repetition (simply repeating the question) and modification (modifying by simplifying the wordings or providing more information)
Students' Oral Reaction to Oral Formative Assessment	Long		Responses that are in complete sentences and with a little elaborations
	Short		Responses that are brief, consisting of only one or two key word(s)
Oral Teachers' Feedbacks to Oral Formative Assessment	Evaluate		Feedback statement that showed teacher's evaluation on students' response/answers. It can happen in positive evaluation (e.g. Good) or negative evaluation (e.g. No, or repeat in a rising tone)
	Comment		A statement or tag question of which the purpose is to expand, develop or provide additional information to students' response; often follows an "Evaluate" statement.
	Accept		Feedback statement that can be realised by "yes", "right" or repeating students' statements.
	Clue		Feedback that are in either statement or question form. The purpose is to provide hints to facilitate students respond to the elicitation

Two illustrative cases: Miss A & Miss B

	Miss A	Miss B
Years of teaching experience	>20	16
Teaching qualifications	Subject trained, with teacher qualification, some LAC in-service training	
School context	<ul style="list-style-type: none">• Band 1 top girls' school• All subjects EMI	<ul style="list-style-type: none">• Band 2 average co-educational school• Only Science & Mathematics EMI
Grade level observed	S.3 (Grade 9)	S.2 (Grade 8)



1. Objectives of the lessons

▶ Both teachers articulated mainly “content” objectives; Miss A usually made these clear to the students at the beginning of her lessons

▶ However, in lesson 3, Miss A explicitly highlighted a language-related objective:

“Miss A: Now we need to learn two things today. The first thing is to describe the result from the graph.”

→ This involves certain typical sentence patterns

e.g. *“As the temperature increases/decreases, the rate of reaction increases/decreases/remains unchanged”*



2. Instruction in the observed lessons

(i) Content vs Language-oriented teaching

	Miss A				Miss B			
(i) Regulative Register	6.9%	26.4%	8.9%	13.2%	15.6%	27.6%	33.2%	18.3%
(ii) Instructional Register	(93.1%)	(73.6%)	(91.1%)	(86.8%)	(84.4%)	(72.4%)	(66.8%)	(81.7%)
- Content teaching	74.4%	89.8%	32.8%	85.1%	91.5%	97.4%	96.7%	93.6%
- Language teaching	25.6%	10.3%	67.2%	14.9%	8.5%	2.6%	3.3%	6.4%

**% out of the total no. of words*

- Both teachers tend to be content-oriented in lessons
- YET, Miss A put more emphasis on language teaching in some of her lessons (especially in lesson 3)
→ This corresponded to her lesson objectives

(ii) Different levels of content and language teaching

Cognitive level	Miss A				Miss B			
	Lesson 1	Lesson 2	Lesson 3	Lesson 4	Lesson 1	Lesson 2	Lesson 3	Lesson 4
Recall	13.3%	59.3%	62.1%	24.0%	87.2%	87.0%	100%	75.7%
Application	82.8%	33.1%	37.9%	60.6%	12.8%	13.1%	0%	24.3%
Analysis	3.8%	7.7%	0%	15.4%	0%	0%	0%	0%

**% out of the total no. of words of the codes at cognitive level*

- Some spread across different cognitive levels in Miss A's lessons, even at the "analysis" level (e.g. prediction, evaluation, comparison)
- Mainly focused on "recall", with some "application" in Miss B's lessons
- Possible reasons: different grade levels (Grade 9 vs 8); different topics

Language level	Miss A				Miss B			
	Lesson 1	Lesson 2	Lesson 3	Lesson 4	Lesson 1	Lesson 2	Lesson 3	Lesson 4
Lexico-grammar	100%	100%	32.3%	47.5%	100%	100%	48.5%	100%
Sentence	0%	0%	12.9%	0%	0%	0%	51.6%	0%
Text	0%	0%	54.8%	52.5%	0%	0%	0%	0%

**% out of the total no. of words of the codes at language level*

- For both teachers, many language-oriented episodes focused on vocabulary and grammar teaching, and they were “embedded” into content-oriented episodes
- Some language-oriented episodes in Miss A’s lessons focused on sentence patterns or even text writing (i.e. the paragraph describing the results of the experiment)

e.g. In Miss A's lesson 3

Miss A:	... Then how would we describe this curve? “Describe the result” means describe this curve, you understand? Now, I will teach you. <u>First of all, I will divide the graph into three parts.</u> Why? Because these three parts, they will have their own special characteristics. <u>Now, let's look at the first part.</u> Now the first part, we talk about the temperature. <u>The temperature will be – high or low? – compare with the other part.</u>
Ss:	Low.
Miss A:	Low, understand? So, how do we start? <u>For the part we say, “at low temperature”</u> , so this part is considered to be “the temperature range is lower”, understand? At low temperature, understand? <u>Now, so, “as temperature increases”, what happens to the rate of reaction? Now, I want you to learn this sentence pattern.</u> As temperature increases, we are looking at the rate, remember? What happens to the rate? You tell me for this part – part number one – how will you describe this? <u>Using similar words, we have “increase”, we have “decrease”, is that right? We have “remain unchanged”, understand?</u> Okay, now which word will you choose for this part, part number one?
Ss:	Increase.
Miss A:	<u>As temperature increases, so the rate of reaction, yes, also increases.</u> Is that right? Now, so it will call “describe part number one”. <u>And then, part number two ...</u>



(iii) Oral formative assessments (Questions)

	Miss A				Miss B			
	Lesson 1	Lesson 2	Lesson 3	Lesson 4	Lesson 1	Lesson 2	Lesson 3	Lesson 4
Recall questions	21.8%	18.8%	12.7%	31.4%	30.4%	52.4%	47.1%	60.9%
Application questions	12.7%	28.1%	7.9%	14.3%	8.7%	4.8%	0%	6.5%
Analysis questions	2.7%	3.1%	4.8%	8.6%	0%	0%	0%	0%
Lexico-grammar questions	11.8%	9.4%	14.3%	4.3%	13.0%	0%	0%	0%
Sentence questions	0%	0%	3.2%	0%	0%	0%	0%	0%
Text questions	0%	0%	0%	0%	0%	0%	0%	0%

▶ **% out of the total no. of questions in that lesson*

(iv) Analysis of written assessment

- ▶ Miss A
- ▶ Only gathered data in formative assessment (a take-home assignment), which included:
 - 1 graph drawing question
 - 3 discussion questions, requiring “Application” skills
 - 2 of them asked students to read questions in sentences, and produce sentences
 - The last 1 asked students to produce a piece of short text
 - Miss A awarded 10 marks for this question



▶ Miss B

(i) Formative assessment: Unit exercise in the workbook

- ▶ 30 marks in total: 5 T/F questions; 5 multiple choice questions; 3 structured questions

Cognitive level	% out of total marks
Recall	40%
Application	50%
Analysis	10%

Language level (productive)	% out of total marks
No production	76.7%
Vocabulary	3.3%
Sentence	6.7%
Text	13.3%

-
- ▶ (ii) Summative assessment (Exam): One structured question in the examination
 - ▶ 7 parts totalling 8 marks

Cognitive level	% out of total marks
Recall	62.5%
Application	37.5%
Analysis	0%

Language level (productive)	% out of total marks
No production	12.5%
Vocabulary	50%
Sentence	37.5%
Text	0%

Summary of the two cases

Objectives:
Content + Language

Objectives: Content

Alignment was observed for both teachers. But which one may better align with the “dual” goal of EMI? And which one may better prepare students for challenges in EMI assessments?

Instruction:
Content + Language

Content + Language

Miss B

Instruction: Content

Assessment:
Content



Conclusion

- ▶ Some noticeable gaps between formative and summative assessments, and between junior and senior secondary level, both in cognitive and (productive) language demands
- ▶ It seems that not all content subject teachers in EMI are providing sufficient scaffolding to prepare students for assessments

Implications:

- ▶ Professional development can also focus on “assessment awareness” → raise teachers’ awareness of how they can assess their students in a valid way
 - ▶ Changes in marking rubrics in assessment to put more emphasis on language/communication → backwash effect
 - ▶ on teachers’ practices
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Thank you!

Questions & Comments to yuenyilo@hku.hk

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