Baby steps in CLIL teacher training: The 'language of' math for teacher-trainees

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Introduction

As elementary school teachers know, April 2020 marks a watershed moment in English education in Japan. 'English-as-a-subject' (EAS) is to be implemented in Years 5 and 6 for 70 hours per year, and 'Foreign Language Activities' (FLA) are to be put into practice in Years 3 and 4 for 35 hours per year. This yearly distribution effectively equates to 2 and 1 lesson 'period 'hours' per week respectively. In practice, however, given lesson periods in elementary schools are 45 minutes, 70 'hours' and 35 'hours' equates to 52.5 hours and 26. 25 hours per year respectively.

Given the sparse numbers of specialist English education subject teachers in elementary schools at the present time, the burden of teaching FLA and EAS has fallen onto the homeroom teacher (HRT). Moreover, as most of the elementary school teachers who will handle the English lessons did not learn how to teach English in teacher-training courses at university, it is no exaggeration to say that the vast majority of elementary school teachers would be feeling apprehensive about not only their own English proficiency levels, but also their ability to teach the new subject, be it FLA or ESA.

In academic year 2014, MEXT began national training schemes for in-service elementary school teachers in an attempt to prepare them for the introduction of English. The plan has called for representative teachers

from each of the approximately 20,000 elementary schools in the nation to undertake a 14-hour 'crash-course' in English education at local universities with education courses, boards of education, or a central school in a particular region or district. These trained representatives then go back to their own schools and hold training sessions for the teachers at their own schools. The goal is, or *was*, for the approximately 400,000 teaching staff at elementary schools across the nation to be trained to teach English by April 2020. Unrealistic? Other measures undertaken by boards of education have included in-service junior high school and high school teachers taking re-licensing courses at universities and re-assigning them to elementary school.

But what of universities with education faculties and the measures they have taken in the meantime to address the shortage of specialist English teachers at elementary school? Here at Aichi University of Education (AUE), a couple of concrete steps have been undertaken. Firstly, beginning with the entrance cohort of academic year 2017, the number of entrants to the elementary school English education program (初等英語選修) has increased threefold to be on a par with secondary school English education majors (中等英語専攻) at 15-18 entrants per programme. The graduating cohort of March 2021 will be the first to be composed of similar numbers of elementary and secondary school graduates. Secondly, beginning academic year 2019, some full-time and part-time teachers in the Foreign Languages Education department were assigned to teach a newly-created subject for non-English education majors: The 'Content of Elementary School English Education' (初等英語教育内容). However, for teachers of this subject (particularly in this past year), there have been very few resources available. Even though MEXT had formulated a core curriculum for this subject with objectives for -'knowledge' and 'skills' (the

two types of 'content'), the inability of the author to procure materials in the form of the soon-to-be-used elementary school English textbooks - 'Let's Try! 1' (Year 3), 'Let's Try! 2'(Year 4) 'New Horizon Elementary 5'(Year 5) and 'New Horizon Elementary 6'(Year) - without violating copyright, constituted significant restrictions when constructing the syllabus. The only 'resource' that seemed to be had that addressed the core curriculum was the 'Elementary School Foreign Language Activity・Foreign Language Training Guidebook' (MEXT, 2017) (小学校学習指導要領解説・外国語活動・外国語編). This 209-page guidebook, not surprisingly written entirely in Japanese, does list some specific content areas that are to be covered in the elementary school English programs, but offers nothing in the way of advice or guidance on methodology for university teachers charged with teaching the 'Content of Elementary School English Education' subject to upwards of 60 undergraduates at a time. Given these constraints, particularly the lack of materials to suit this course for both the teachers and students (i.e. no actual elementary school textbooks), this paper is this author's attempt to construct a syllabus and teach this course to first year math education majors.

The student-teachers

This past semester (October 2019 to February 2020), 58 students were assigned to the 'Content of Elementary School English Education' (初等英語教育内容) taught by the author. One student was unsighted beyond Week 1 of the course and another student ceased attendance for personal reasons, leaving 56 that completed the course. The major fields of study, the year and the level of license the students were studying towards (primary school 初等 or secondary school 中等) can be seen in Table 1. The 'AI' classification of the course meant that this course constituted their

introduction to the 'Content of Elementary School English Education' subject 'escalator'.

Table 1. Wednesday 1 Student Body Classification

Year	Education major	License	n
1	mathematics	primary	25
1	mathematics	secondary	21
1	Information technology	primary	5
1	Education science	primary	1
1st Master	Education science	primary	4
			56

As is clear from the data above, the majority were majoring in math education, with the primary school license cohort the largest at 25. Just why the academic affairs department assigns different majors and different license cohorts to the same course is another question that has so far defied logical explanation in the opinion of the author. Moreover, the assumption that English education is the same at both levels (primary and secondary), while on the surface appearing to be deeply-rooted amongst administrators, is perhaps one of convenience and necessity, but nevertheless one that needs refuting and re-thinking.

In constructing the syllabus and formulating the week-by-week content and methodology of the course, aside from the restrictions mentioned above concerning primary school English education textbook availability and the exact content of said textbooks, a number of other factors were considered. Firstly, it was recognized that the Japanese language skills of the author combined with the English language skills of the students would preclude the teaching of a theoretical or methodological English

education course entirely in Japanese in a lecture-style format. Secondly, a 'fad' of the times, 'Active Learning' (AL), would not be best served by such a lecture-style course. At its most basic core, AL demands student-activity, not sleeping. Thirdly, given increased immigration levels to Japan, it is likely that these future-teachers will have amongst their future class cohorts, non-Japanese immigrant students or newly arrived immigrant students with little initial Japanese language skills. These arrivals could be across both levels, primary and secondary. Given all these factors, as well as the restrictions mentioned in the introduction to this paper, equipping them with some basic English math language and math methodological practices was decided upon.

As to how to do it and how to implement it, the author at least had the first semester of the year in which to come up with a syllabus and methodology that was not only of the greatest potential use to the students in their future careers, but also one that would produce assessment data for each of the 56 students. Luckily, the author's training and years of experience as a primary school teacher in Australia, as well as recent research interest in CLIL, provided an answer to the problem of how to identify the necessary language for both content and methodology.

CLIL to the rescue

'Content and Language Integrated Learning' (CLIL) is a dual-focused approach in which "subjects, or parts of subjects, are taught through a foreign language with dual-focused aims, namely the learning of content, and the simultaneous learning of a foreign language" (Marsh, 2002, p. 2). Its dual-educational approach interweaves both subject content for primary, secondary and vocational level subjects such as math, science, art or business (Mehisto, Marsh & Frigols, 2008) and an additional

language that is not the student's L1 "even if the emphasis is greater on one or the other at a given time" (Coyle, Hood & Marsh, 2010, p.1).

Mehisto *et al.* (2008) states that the core of any teaching-learning process is driven by cognition, *i.e.* thinking. The mental faculty of *knowing* about something includes cognitively engaging with that content through processes such as perceiving, recognizing, judging, reasoning, conceiving, and imagining (Mehisto *et al.* 2008, p. 30) to make meaning. The process of making meaning of new knowledge and skills (content) through cognitive engagement is developed through both personal, social and cultural interaction (community/culture), personal as well as cooperative reflection/analysis (cognition) and through a communicative process (communication) with peers. (Mehisto *et al.* 2008).

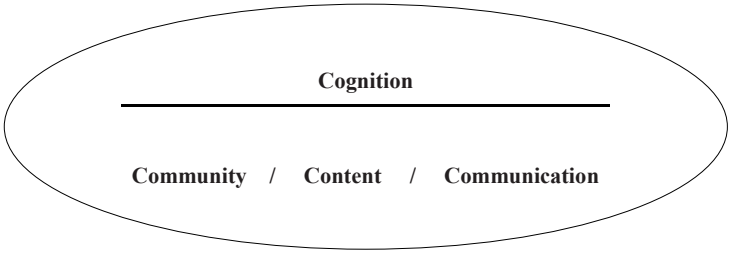

Figure 1. CLIL Principles (source: Mehisto, *et al.* 2008, p. 31)

These four principles serve as the reference point upon which CLIL-oriented syllabuses and lessons are built (Mehisto, *et al.* 2008; Coyle, *et al.* 2010) (Figure 1). Each of these and their roles in this course are briefly addressed below.

(1) Content of a subject usually refers to the specific knowledge of that subject such as social studies, geography, science, music, or, in our case, mathematics. However, in CLIL programmes, acquisition of content is considered to be not only knowledge acquisition but also acquisition of the skills needed to access that knowledge (Coyle, *et al.* 2010). In other words, not only the knowledge core of mathematics is necessary but also the skills to acquire that content. In our case, however, the students were assumed to have previously acquired both the knowledge of content and the skills in their L1 Japanese, given they were university students and the majority were mathematics education major. However, what they did lack in terms of content was L2 language content as well as methodological content, i.e., how to teach that content in English and perhaps even in Japanese given that they were first year students and perhaps maybe had not been specifically instructed in methodology to date. Fundamental to teaching content is the efficient use of language when teaching such. For this, we turn to the second major principle of CLIL that was considered in the construction of this course: communication.

(2) Communication in the CLIL setting refers to two complementary aims: (a) learning language in order to use language, and (b) using language to learn. The first refers to learners' engagement with the traditional communicative language curriculum comprised of essential grammatical and lexical items needed for communication, while the second involves learners using the vehicular language in order to learn content about a subject.

Figure 2. Communication in the Japanese context

(adapted from Ikeda, 2017 & Coyle, *et al.* 2010)

CLIL utilizes the 'Language Triptych' (adapted to the Japanese context in Figure 2) as a conceptual representation to make clear the connections between three interrelated language perspectives in use in a CLIL lesson. These are the:

- language *of* learning
- language *for* learning
- language *through* learning

The language *of* learning refers to the language needed for learners to access the basic concepts and skills of the subject topic or theme. It is comprised of content-obligatory lexical items such as technical vocabulary, special expressions, synonyms, and syntactical features including verb tenses (e.g. past tense, present tense etc.) and things such as 'active' and 'passive voice.' "For the subject teacher, it requires greater explicit awareness of the linguistic demands of the subject or content to take account of literacy and oracy in the vehicular language" (Coyle, *et al.* 2010,

p. 37). In our case, the students needed the technical vocabulary of mathematics in English.

The language *for* learning focuses on the kind of language needed to operate in a foreign language classroom. In the CLIL classroom, learners need to be supported in developing speech act skills such as those expressions required for the different interaction modes of whole class discussion, pair and group work, asking questions, debating, enquiring, describing, evaluating, and drawing conclusions, among others. Equally important is the language of classroom, lesson and task management. Given that the majority of students (25) would probably become HRTs in their future and be required to teach English, it is this latter type of language, that was adopted as a major component of the course.

The language *through* learning in a lesson, although largely unpredictable, is an aspect of the activities experienced by the learners in a lesson. Content-compatible and language-learning compatible language emerges *in situ* as it is needed by the learners, and includes making connections with and drawing upon prior knowledge, skills and strategies that cannot always be predicted in advance. However, when it comes to mathematical content, this type of language is more predictable than most subjects. In math, there are specifically ordered and logical procedures that need to be taken in order to reach the correct solution. Particular efforts were made to identify this procedural language pre-course as specifying step by step the logical process needed to solve a problem drew heavily on this type of language (see below).

(3) Cognition refers to the levels of cognitive engagement of the learners with the learning activities that are designed to teach the content. 'Cognition' is the building block for interacting with the Content: writing

lesson objectives and structuring and designing classroom learning tasks and activities. The 'Revised Bloom's Taxonomy (RBT) for the Cognitive Domain' (Anderson, Krathwohl, Airasian, Cruikshank, Mayer, Pintrich, Raths, & Wittrock, 2001), has become a particularly important tool for teachers. The RBT recognizes six levels of cognitive processes, *i.e.* thinking skills. In order of ascending cognitive complexity, the thinking skills are 'Remember', 'Understand', and 'Apply' which encompass the lower-order thinking skills (LOTS), and 'Analyze', 'Evaluate', and 'Create', which encompass the higher-order thinking skills (HOTS). In our case, rather than the teacher continuing to act as the transmitter of knowledge (i.e. how to structure the language and process of solving mathematical operations), the activities were designed to challenge the students and engage their HOTS as well as LOTS: to analyze the mathematical equation, access their prior knowledge, create their own procedures and procedural language, then evaluate their performance.

(4) Community refers to the modes of interaction within a lesson such as individual, pair, and group work as well as whole class discussion. The dominant model of content learning in traditional western societies emphasized the transmission of the knowledge and skills of the expert (teacher) into the memory bank of the novice (student). With the eschewing of behaviorism in the 1950s, the centrality of the teacher in the classroom has gradually become replaced by the emergence and encouragement of the learner as an active participant in his or her own learning rather than purely as a passive receiver of knowledge. i.e. An active learner. Vygotsky (1978) suggests that learning takes place in the 'Zone of Proximal Development' (ZPD) –a point just beyond what a learner already knows or what a learner can do on his or her own–when they

interact with 'expert' others or peers on the condition that appropriate support, scaffolding and guidance are provided by the more expert peer or peers. In other words, interactive dialogic learning modes are fundamental to the learning process. In our case, with 56 students in a lesson, and given the few opportunities for the teacher to render guidance to individual students affords over the course of a semester, the teacher has very little choice but to rely primarily on the support and guidance generated by other-peers within the group.

The course components

(a) *The Objectives*

By the end of the course the students will:

(i) be able to teach the process of solving mathematical operations in English: Specifically how to solve addition, subtraction, multiplication, division and addition of fractions sums, using English.

(ii) have increased their knowledge of classroom English language.

(iii) have compiled a 5-item video portfolio of their own performances when solving the above sums.

(b) *The Materials and Resources*

(i) Textbook

The textbook was 'Hello, English: English for Teachers of Children' (2016) (Aiba, C., Fujiwara, M., Byrd, B., & Barrows, J.) published by Seibido. This textbook was selected because it was specifically written to equip pre-service and in-service teachers with basic English that they would need to manage not only English lessons but also interactions with ALTs.

Furthermore, the book includes a self-study CD so students were able to do the listening exercises out of lesson time. Although there are 15 units in the textbook, time restrictions meant that only 10 could be covered during the semester. Each unit is composed of (a) Dialogue (b) Substitution: key words in the dialogue were replaced, and he dialogue repeated (c) Listening section (d) Reading comprehension followed by a comprehension check of 3 questions (e) Grammar point explanation (f) Vocabulary activity, and (f) Useful expressions: sentences ware jumbled up and students required to re-order the words to make a sentence.

Unit 1: ALT's First Visit to Minami Elementary School
Unit 2: Getting to Know each Other
Unit 3: School lunch
Unit 4: Play Time
Unit 5: The First English Class
Unit 6: Teaching Numbers 1
Unit 7: Teaching Numbers 2
Unit 8: Reflection
Unit 10: Growing Plants & Observing the Butterfly Lifecycle
Unit 12: Making a Town Map

(ii) Classroom English (CE) lists

Two CE lists served as the content of assessment for the language for learning. Pages 106 through 110 of the textbook, and pages 118 to 123 of the 'Elementary School Foreign Language Activity・Foreign Language Training Guidebook'.

(iii) Whiteboards and markers

(iv) personal smart phones

(c) *Evaluation*

(i) Attendance = 15%

(ii) Video Performance = 20% (Students 'airdropped' 1 of their 5 videos to the author)

(iii) Written Exam = 40%

(v) Classroom English Quizzes = 25%

(d) *The Syllabus Outline*

The class met 14 times over the semester, with the 14th lesson being the administration of the written examination. Two classes were cancelled due to other business including teaching practice supervision. The first lesson in Week 1 outlined the course and set out the expectations, read through the introduction to the textbook and distributed Classroom English list A (textbook pp.106-107), which focused upon basic translations of Japanese school subjects, club names, and weather terms in English.

Weeks 2 and 3 included: (a) showing the students how we would work with and study the textbook units. The first unit of the textbook ('ALT's First Visit to Minami Elementary School', pp. 8-13) was gone through and the role play (HRT meets ALT) was practiced in pairs; (b) practicing transcription of basic numbers in English to the millions; (c) dividing the cohort into 12 groups of 4 or 5 students.

Weeks 4 through 13 (10 lesson periods) were divided into two-week blocks, each consisting of 'Week A' and 'Week B'. Each of the 5 mathematical operations were assigned to a two-week block. The idea was that Week A would be an 'investigation' lesson in which the students would first work with each other to construct an English translation of the

optimum methodology to use in order to solve to equation. Examples of the final versions can be seen below. In Week B of the block, the students were to practice and then film each of he members of the group doing the sum i.e. teaching their peers. One person was then selected by the group to airdrop their own video to the author. At the end of the semester, the teacher was in possession of 56 videos, one for each student in the class.

The lesson components and structure

Each week, the 90-minute lesson period was divided into three.

(i) Part A took approximately 20 minutes and was composed of taking the roll and a 10-12 item 'Classroom English' (CE) quiz. After Week 2, when the teacher had given an example of how to administer the quiz, the four Master students amongst the student cohort took over responsibility for administering and correcting the 10-item classroom English quiz. They automatically received full marks for the quiz when it was their turn. The postgrad student read out an expression in Japanese and the students had to write the English equivalent. Questions 11 and 12 were asked by the author, and initially required the students to write in digits, the 2 numbers they had heard in English: an example being, "Write this number in English. 1,237,069." Gradually, as the language of the equations was taught, questions 11 and 12 consisted of exemplar sums (e.g. 13, 405 plus 35,028) that students had to understand and also solve. Initially, the results of the CE quizzes were not promising. A total of 32 students failed Quiz 1 in Week 2, 30 failed CE2, and 24 failed CE3. In Weeks 1 and 2, the author had collected the quiz sheets from each student and had recorded them after the lesson. In Week 3, however, the author changed strategy and students were required to call out their result *in front of the other*

students. Beginning with the next week and CE4, Classroom English quiz scores improved dramatically. For the next 7 quizzes (CE4 through to CE10), a total of only 10 failures were recorded, the average failure rate plummeting to 1.4%.

(ii) Part B was composed of the textbook unit and took approximately 30 minutes. Students were required to complete the unit exercises for homework, and each unit was corrected in class. Also, as each unit in the textbook included a focus dialogue, the students practiced this in pairs, initially while reading but as they gained more facility with the language, with books closed and from memory. In future, these dialogues will be recorded.

(iii) Part C. The format of part C depended upon whether or not it was a Week A or a Week B. In Week A, the students worked in pairs to first write out the process of solving a particular equation (e.g., addition). In particular they were told to imagine the exact words they would use in Japanese to 'think aloud' the process, and to write them down. One of the partners would use the think aloud protocol while solving the equation while the other took notes of what he or she had said. The pair then wrote out a final draft in Japanese and then attempted to translate it into English. This took approximately 20 minutes. Once the majority had transcribed the process, the author then gave a powerpoint presentation that first drilled the students in the basic language of the operation and finally described the correct process and language to use when solving the equation in English. The advantage of the powerpoint for drill is the slide presentation speed can be varied. In Week B, the 2nd week in the cycle, the students were divided into groups of 4 or 5. Whiteboards and markers were distributed to each group. Using their cellphone video record function,

the students then filmed each other solving an original equation (i.e. each student used different numbers). Picture 1 below shows an example frame from a student-produced video. Space restrictions preclude including pictures from all 5 operations here. Tables 1 through 5, list the content-obligatory language (i.e. the language *of* learning) and the content-compatible language (i.e. the language *through* learning).

Operation A: Addition

Table 1: The Language *OF* and the language *THROUGH* ' Addition'

Sum	Step	Procedure	Content-obligatory (of)	content-compatible (through)
 1 2 7 + 3 5 ---------- 6 2	A	The sum is 27 plus 35.	sum equal/s plus / and add / addition (numbers 0-10) carry ones / tens (hundreds) (thousands) (10 thousands)	put down in the *ones/ tens* etc the answer is
	B	7 plus 5 equals 12.		
	C	Put down the 2 in the ones and carry the 1 to the tens.		
	D	1 plus 2 plus 3 equals 6.		
	E	Put down the 6 in the tens.		
	F	The answer is 62.		

Operation B: Subtraction

Table 2: The Language *OF* and the language *THROUGH* 'Subtraction'

Sum	Step	Procedure	content-obligatory (of)	content-compatible (through)
6 1 ~~7~~ 2 - 1 5 --------- 5 7 --------- -	A	The sum is 72 minus/take away 15.	sum minus / take away subtract/subtraction borrow carry add to equal/s ones / tens hundreds / 1000s 10 thousands answer	can't be done becomes in the *ones/ tens* etc the *answer* is
	B	2 minus/take away 5 can't be done.		
	C	Borrow 1 from the tens and add to the ones.		
	D	7 becomes 6 tens, 2 becomes 12 ones		
	E	12 minus/take away 5 equals 7		
	F	6 minus/take away 1 equals 5.		
	G	The answer is 57		

Operation C: Multiplication

Table 3: The Language *OF* and the language *THROUGH* 'Multiplication'

Sum	Step	Procedure	content-obligatory (of)	content-compatible (through)
1 3 4 7 X 2 5 --------- 2 3 5 9 4 0 ---------- 1 1 7 5	A	The sum is 47 times 25	sum times multiply multiplication multiplied by add plus add to carry	put/write down makes
	B	5 times 7 = 35. Put down 5 and carry the 3.		
	C	5 times 4 = 20. Add 3 to make 23.		
	D	Put 0 in the ones.		

	E	2 times 7 = 14. Put down 4 and carry the 1.	equal/s ones / tens etc answer thousand/s	
	F	2 times 4 = 8. Add 1 to make 9. Put down 9 in the hundreds.		
	G	Add 235 and 940. 5 plus 0 = 0, 3 plus 4 = 7, 9 plus 2 = 11.		
	H	The answer is 1175		

Operation D: Division

Table 4: The Language *OF* and the language *THROUGH* 'Division'

Sum	Step	Procedure	content-obligatory (of)	content-compatible (through)
14 r6 18 /258 - 18 78 - 72 6	A	The sum is 258 divided by 18	sum divide division divided by times bring down minus / take away remainder equals times answer once, twice, 3 times etc. answer	put/write down go/goes into does not go into but makes
	B	18 does not go into 2. But, 18 does go into 25.		
	C	18 goes into 25 once. Put down 1. 1 times 18 = 18		
	D	25 minus 18 = 7		
	E	Bring down the 8		
	F	This makes 78		
	G	18 goes into 78, 4 times.		

		Put down 4. 4 times 18 = 72.		
	H	78 minus 72 = 6.		
	I	The answer is 14 remainder 6		

Operation E: Addition (Fractions)

Table 5: The Language *OF* and the language *THROUGH* 'Fraction - Addition'

SUM			
		$2\frac{5}{6} + 3\frac{7}{8}$ $= {}^{17}/_{6} + {}^{31}/_{8}$ $= {}^{68}/_{24} + {}^{93}/_{24}$ $= {}^{161}/_{24}$ $= 6{}^{17}/_{24}$	
Step	Procedure	content-obligatory (of)	content-compatible (through)
A	The sum is 2 and 5 sixths plus 3 and 7 eighths	fraction sum plus	and
B	You cannot add sixths and eighths.	(ordinals)	you cannot add
C	So you must use the lowest common denominator	lowest common denominator	So you must use the
D	2 times 6 plus 5 = 17	times / plus / equals	
E	2 and 5 sixths becomes 17 sixths.		and becomes
F	3 times 8 plus 7 = 31		
G	3 and 7 eighths becomes 31 eighths		

H	6 and 8 both go into 24	go/goes into	both
I	So 24 is the lowest common denominator		so...is the...
J	In the case of 17 sixths, 6 times 4 = 24,		In the case of
K	so 17 times 4 = 68		
L	17 sixths becomes 68 twenty-fourths		
M	In the case of 31 eighths, 8 times 3 = 24,		
N	so 31 times 3 = 93	times	
O	31 eighths becomes 93 twenty-fourths		
P	The sum is now 68 twenty-fourths plus 93 twenty-fourths		the *sum* is now
Q	68 plus 93 = 161		
R	24 goes into 161 six times, remainder 17	remainder	goes into
S	The answer is 6 and 17 twenty fourths	answer	

Picture 1: 'Addition' recording

Conclusion

The time of writing of this paper has coincided with the final week of the semester, and as yet the performance of the students in their uploaded videos is not assessed. Each is to attract a score out of 20, with 5 points awarded for each of the following categories: intelligibility, fluency, eye contact with peers, and vocal performance. Similarly, marking of the written exam, which required students to write out the process and corresponding language for each of the 5 mathematical operations is not yet completed. That said, a cursory inspection of each of the 56 papers reveals that there will be no students failing the written exam. With the exception of minor errors, all appear to have scored highly.

As noted in the introduction, the teaching of this subject in this past semester coincided with a 'perfect storm' of negative factors. Chief among them was the restrictions placed upon the teacher in terms of content: not having access to the actual English texts that are to be used in the regional elementary and secondary schools from April 2020 meant that the content of the English education syllabi could not be accessed, and therefore could not be used as the material for this course. Furthermore, it is important

to note that even if the textbooks and manuals for each had been accessible, there is no guarantee that they could have been acquired. Universities of education like AUE and universities with education faculties do not automatically receive copies of textbooks (or their updates) from the publishers, boards of education, or MEXT. In other words, even though we train the teachers to become English teachers, we are expected to do so without the actual resources that in-service teachers use in their lessons. University teachers and researchers are left to procure these resources in any way they can. This is incongruous.

The vagaries of the system also mean that because schools and students receive textbooks for no or minimal cost, even buying them is difficult for those that are not in-service teachers. Finally, even if the teacher manages to procure copies, copyright laws limit just how much can be copied for use at university. Each student would need to buy their own copies: for this course, perhaps 4 books. In this time of change, when all HRTs are expected to teach English, it would behove those in authority to also make these materials available for teacher-trainees in education courses. I am not sure if this problem is limited to English, but something tells me it is not.

Notwithstanding that, the purpose of this paper was to describe a methodology for training future primary school teachers and future secondary school subject teachers in teaching mathematics in English. At the very least, the course has equipped students with an arsenal of classroom English, as well as a personal video bank of them describing the solving of basic mathematical operations in English.

This course, as described here, will disappear this year: the content will change, publishers will start producing textbooks in line with MEXT's core curriculum and the textbooks for Years 5 and 6 will become available.

However, I will keep the files in my computer, tucked away in a special folder marked 'In the event of...' Maybe, just maybe, I will find them of use in the future should English as a medium of instruction (EMI) ever gain a foothold, as it has in Singapore.

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