Café CLIL 12 – Language of Maths: Minutes

The latest café clil discussion on the language of maths took as its focus pages from AQA GCSE Maths Higher, chapter 20, pages 350 to 358.

Data Finding, Averages

The unit is entitled Averages, and deals with different methods for finding average sums including mean, mode and median of a data set.

We were lucky to have Sandra with us as our maths expert, as I always say, it’s only the subject teachers who can give the real classroom perspective on CLIL. We can talk about Maths through English, but we need someone who actually does it to be able to consider real examples and real experiences.

The language of Maths is invisible

JC stressed first that one of the problems with Maths as he sees it is that a lot of the language is not visible on the page in the way that it is with other subjects, Sciences or Geography for example.

SL gives an example of procedural language, language for setting out the steps to follow in solving a Maths problem and JC points out that it is the calculation said out loud that could cause problems.

KK explains that two different areas of language are being described, one is the language of the steps and sequences and the other is the language of the component parts of the solution to a problem, the names of items in a formula and solution.

What can we do with very abstract concepts?

SL points out that the textbook pages under discussion aren’t the best, they aren’t visual and they don’t go very far in presenting many of the abstract concepts in the pages. PR adds that the textbook explanations were very helpful to following the concepts. The conclusion is that the textbook pages are very dense with new concepts and that they could do with more visualization and contextualization in everyday situations the learners will be familiar with. PR suggests that the pages are overloaded with information and a good approach would be to lift out a single example and write it up on the board so that learners could focus their whole attention on it as opposed to it being lost in the pages of the textbook.

There is a need for high quality teacher talk

KK suggests that there is a need for repetition and responsibility on the teacher to be aware of confusion, looking out for confusion in the learner group. JC stresses the importance of the quality of teacher talk. In Science, you can work out what is going on from explicit language, but that is less the case with formulaic nature of the language of Maths evident in these pages.

Telling Maths stories

SL suggests that creating stories behind the concepts helps learners understand the ideas they involve. PR agrees with the idea of visualization through story as a way of making concepts more concrete to learners. There is a question – How do CLIL teachers get the language to talk students through tasks like these?

Time to translate

KK refers to the book Active Literacy Across the Curriculum by Heidi Hayes Jacobs, likewise to *Teaching Mathematics to English Language Learners, Kersaint et al* which suggest that learners need to ‘retell’ content in their own language as a step to being able to use the specialized language of the content subject. This step offers learners time to ‘translate’ ideas into their own words, before being asked to produce the specialized Maths language.

Interaction in the subject

SL criticizes the diagrams, particularly use of leaf and stem diagrams in this unit, adding to the overload of material students have to deal with. KK asks about interaction, there isn’t any obvious interaction on the pages of the book.

SL describes lessons she has led where students are responsible for explaining concepts to others in the classroom offering them pair and group interaction.

Levels of language

JC points out that there are several levels of language. 1) There is the level of learners talking informally about Maths, and SL agrees that students usually talk about what is immediate to them whereas teachers tend to have a more global view. 2) There is also the formal language of Maths and 3) there is the first language of the learners. JC suggests that this must slow learners down in the maths when they are being asked to work in L2. SL disagrees saying that she keeps her own language simple and there is a lot of repetition, sticking to core language.

KK refers to an article (link) which describes studies suggesting that working in a language that isn’t mother tongue does slow you down.

Is it harder for the teacher or the students?

SL reports that students often understand the Maths, but the job for the teacher is often much harder in that they are expected to ‘perform’ in the foreign language of Maths which takes practice. SL suggests YouTube is a good source of this language.

JC again stresses the quality of teacher talk as essential and KK points to examples which demand fuller language utterances from students such as tasks which get students to ‘explain’ or ‘compare’. JC gives example:

Which is smaller 5 / 16 or 6 / 17

And there is agreement that students might cope with the maths of this task, but the next part of the task creates complications:

Explain how you know?

Students here are asked to produce much more language in explaining how they came to their answer. PR suggests that once students have grasped the concept, it is easy for them to do the Maths, though difficult to verbalize it.

JC stresses the role of rich input from the teacher, and PR suggests repetition of teacher’s models as a way ahead.

Exams and Maths language

There is some discussion about expectations and demands of Maths exams and JC gives example of test materials in Qatar which are largely just based on number answers. KK asks if this is the case in most countries. Do students in Maths exams ever have to produce fuller utterances in answer to questions? (Host note – there is a link to a PPT which deals with language demands of Maths exams here. But these are all British test items)

LD’A points out that in primary in Italy there is a lot of ‘story’ context given to content learning including Maths, but that secondary suddenly turns very abstract. KK thinks that this happens in most contexts.

JC asks SL where she learned her English Maths language, and she replies from native speakers, from YouTube. SL adds that her approach is to create portfolios of language, as well as using mainly graphics as input material with her Maths students. KK asks if it would be useful to have an archive of topic-specific recordings of Maths as contexts for good core language.