PL 2.02
Curriculum Area: Science and Geography
Topic: Science exploration

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Context

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I recently started re-reading the French *Asterix* albums. Even though I can read French, I have been reading the English translations by Anthea Bell and Derek Hockridge. Yes, I can *understand* the text as written in French, but the real comprehension is lost in translation - the bard being named Panoramix in French means almost nothing to me, but Cacophonix makes sense.

There's understanding of the language, and understanding of the context and culture in which the text was produced. I can tell you what the characters are saying, but I can't tell you why they're saying it - in English, I can, because I'm situated in the same context.

Sort of.

In the Bell / Hockridge translations, intended for British audiences, a lot of foreign-language references are retained. These likely would have made sense to educated readers at the time the texts were first translated - it was fine to leave Latin jokes and puns in, as students in Britain likely would have had to study Latin and would get the gist. They'd also get the historical and geographical references from school.

Oddly, when I first read the books (when I was 10 or 11 years old) I had no trouble getting the jokes, puns and references either. Yes, I did have to study Latin at school - but that only started when I was 16 years old, so that didn't help. I have some theories about how I knew that Lutetia was Paris, or Lugdunum was Lyon, or that *acta est fabula* means 'the story is over', but however I knew them, I knew them. If questioned, I could explain what the references meant, their function in the text, etc.

This was before the Internet was as ubiquitous as it is today. I was one of the first among my peers to have the Internet at home, and at that stage I did not yet have it. We didn't even have access at school! I wasn't googling these things, and I sure wasn't looking things up in other books.

(OK, fine, I did read *The Decline and Fall of the Roman Empire* when I was 10. I also read a lot about Vercingetorix in really, really old books. He doesn't get a lot of coverage in new texts.)

The thing is, re-reading them now, I have no idea what half the references are. I still get the names - the centurion Surplus Dairprodus' name is not a complicated joke! - but I forgot what *acta est fabula* meant. I forgot that Lugdunum was Lyon. Strangely, I still got the joke 'Why the past tense?' when a character says 'visi' (the prefix in visigoth) instead of the anticipated 'vici'. How I got that, I don't know, but it's a funny joke.

What I have had to do is google things. And that's the important bit - I *am* googling them. I'm not ignoring the bits I don't understand.

This is something incredibly frustrating when teaching Reading. I cannot comprehend how students can just keep reading after not understanding part of a text. Fine, you don't need to fully understand every last detail, but if you are reading a text about a skier named Tara

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and you don't know what skiing is… you need to stop and find out. Being able to decode the words is not enough.

I regularly drill into my students the importance of stopping and finding out. Sometimes, a very valid point is thrown back at me - 'I don't care.' (If you don't care, it isn't the right text for you.) It's a long, drawn-out process, but my students always learn to stop and ask - and they've all sat through lessons where I've confused myself, abandoned the lesson and found things out for myself.

I apply the same to Science. I have… much greater than usual science knowledge and science understanding. But it is just… facts and processes. I don't really know why things work the way they do, or why I or anyone else should care. I just know *how* things work the way they do.

This came to a head during my final teaching placement and even moreso in my first year of teaching. I took a group of three students out to make and launch rockets as a reward. We used bicarb soda and vinegar as our fuel. I was easily able to explain the chemical reaction occurring between the two substances, to reassure the students it was safe to touch. (One of the students pointed out, after my explanation, that I hadn't accounted for some Hs and Os… I forgot to mention the water byproduct.)

The knowledge I had was utterly useless for what we were doing. Our learning was to explore and engage - the fact I already knew what would happen and how provided no benefit, and it meant I missed out on the fun.

Later in my first year, one of our leading teachers planned a science activity for us - making and playing with oobleck. In theory, I know how oobleck should work (it creates a suspension, with the starch particles suspended evenly in the water, making the fluid behave in ways young learners may not expect) but I ignored that knowledge to just explore with the kids. Instead of ensuring the kids knew how it worked, I focused on the experience of playing with it, asking questions and testing it out (the best being 'What would happen if we threw it at our P.E. teacher?' - the answer was not what I expected, but it was fun finding out!).

The *finding out* is the key part, just like with Reading. I would never expect my students to just know or just accept what I tell them about a text; they need to engage with it themselves and find out for themselves when they are stuck. The same applies to Science…

… and I'm in a perfect position to model it. At Levels 3-6, students are tasked with exploring why things happen, or predicting the effects of things. I can apply a logical, theoretical approach to this which more often than not will tell me the right answer, but that's a different skill and different approach to what is expected for and from my learners. They specifically need to explore, not just tell the right answer.

I realised that I already do this quite a bit. Recently, we had a curriculum day in which chicken was served for lunch. I don't eat chicken for moral reasons. It then had me wondering why I eat eggs, but won't eat chicken - the same moral reasons should apply. This led me to investigate (explore) the differences between a chicken and its eggs. I ended up with very little new knowledge, but the act of exploring led me to new opinions and attitudes.

The goal is to help students see what it is like to *explore* things they don't understand, not just to google the right answer (or ask the teacher). For me, this is most easily developed

through exploring science, as that area engages me, but in theory the same approach could work in any curriculum area.

A secondary goal is to elaborate on this to support students' literacy development through exploration and experiential learning, but that is for another time.

In the curriculum

In the Victorian Curriculum, inquiry skills are somewhat fragmented and introduced in ways which rely on progression through key areas of the curriculum (i.e. English and Mathematics). They define specific skills and approaches.

What I am describing is more an issue of *disposition,* which is not covered by the curriculum. However, developing a greater disposition towards learning in general is likely to enhance engagement and see greater development of the inquiry skills defined in the curriculum.

In the particular task being explored for this PL, I am looking at weather, which spans both the Geography and Science domains, however that focus is incidental.

Building disposition

The purpose is to get students to ask questions and explore things which they don't understand. I am writing this document on a Saturday night. It was my intention to go play soccer at an oval which is near both my home and the school at which I teach, but the rain has continued (which doesn't really bother me) and the oval is muddy (which also doesn't really bother me, but I just got a new car, this would be the first time I would be driving it, and I don't want to get it messy yet).

This led me to wonder about rain. I know how rain works. Water evaporates, the air becomes saturated, when the air is at full saturation the water condenses and falls back to the ground.

I also wondered about mud. I know what mud is - it is dirt suspended in water. And it's messy.

This led me to wonder how I could explain this to someone who didn't know what these things were, and what might happen if we had awesome, coloured rain. How could I show someone what a cloud is like? How could I show water falling through the air? How could I show the mess it makes on the ground? Most importantly, how could I do it all without making a massive mess?

That's the stuff I need to explore.

It occurred to me that I could simply get a transparent container, fill it with water (simulating "air"), put cotton wool on the top and pour a more dense liquid through it. This of course did not work, as the cotton wool became sodden and sank into the water, which is not what clouds do. It occurred to me the clouds would need to disappear as the 'rain' fell, as that *is* what clouds do.

I tried again, this time with shaving cream as clouds. It worked, except the 'rain' was invisible. I needed something more dense, and visible against the water, so I used food colouring - and it worked! It modelled the process I wanted to show.

But what value is there in this? If I showed this to a learner without any context, what possible benefit would they get from it? It's just a funny, colourful, messy show.

<u>What I was missing</u>
The problem and the explanation. It occurred to me as I did this that actually seeing the process wasn't the important bit - it was understanding the steps which led me to try it. *Why* was I mixing these ingredients? *What* was my goal? Even if I was unsuccessful in showing anything or explaining a concept or process, the act of going from a problem to a response was what I needed students to see and learn.

<u>Second attempt</u>
This time, I decided to repeat the process *and record it as a video, narrating what I was doing.* I then used that video as a background while explaining to students the steps which led to me doing that process.

It spontaneously occurred to me that I could also ask follow-up questions and describe how I could investigate (explore) them.

Next steps

What's in it for the students?

If students already don't care about exploring things they don't understand, or even questioning things, why would they engage with this content in the first place?

Given the specific context in which I am working on this, the solution was obvious - rewards for engaging. But that isn't always an option. The next step needs to be to find a way for students to develop an interest, or find an incentive, to work on developing a disposition towards developing and exploring.

<u>Professional</u>
Strictly speaking, I am not currently a science teacher. My workplace does not have science teachers - science is rolled into the general classroom curriculum (as it should be). I am an Auslan specialist. However, the same thing applies - how can I get students sufficiently engaged to question and explore what they don't understand in Auslan?

The answer is the same - rewards for engagement. At Level 3 and 4, the core of the Communication strand in Auslan is to follow instructions. But instructions for what? That's the reward. Students can learn what they want to learn, or do what they want to do… provided they can follow the instructions to do it when issued in Auslan.

Interestingly, this does lead back to science, as most of my students have been asking me to teach them science (which I would love to do). Why not have the lesson content focused on science, with instructions given in Auslan? Exploring the Auslan content will help students get what they want (the science content).

<u>Students</u>

At my workplace, it is common for classrooms to have 'wonder walls', where students pose questions about topics. This is not sufficient - this is really only identifying what students don't know or, at best, what they want to know.

The key is to <u>develop their disposition.</u> Wonder walls don't do this, they only reflect their current disposition. To best develop this for students, there needs to be student-directed learning. In an ideal world, this would mean each class I teach picking their own topics to learn about - but that while that can be done easily for a general classroom teacher with only their class to worry about, it is ambitious for me, with twenty-three classes.

<u>Immediate steps</u>
In Term 2, it is my aim to teach Auslan via a science context. In Term 3, the goal would be to allow students to pick their own topics, and to teach Auslan via those topics.

Right now
Editing the video recorded for the process and making it available for learners. Also recording another video as an engagement reward which may be used in-class in Term 2.