Experiences Conducting "One-on-one" Diagnostic Interviews.

By Eric McAuslan

One-on-one interviews are a marvellous way that I gained insight into how my students actually work on problems, and the processes they go through towards solving a problem. I will recall one of my interviews forever because I would **never** have guessed how this Year 9 lad solved simple equations had I not conducted a one-on-one interview with him. I read him the question "n - 5 = 13" and waited. I could see him counting on his fingers. After about 15 seconds, he said, "14". "How did you get that?" I asked. He replied "a, b, c, d..." and n is the 14th letter of the alphabet. The next question I showed and read to him was "5n = 20". He answered immediately "14". He said the n's had to be the same. I hope that this rather humorous anecdote illustrates how a one-on-one diagnostic interview can pick up things the written test can't possibly show.

I conducted my one-on-one diagnostic interviews in the mathematics department's office. The room had a table and chairs with good lighting. Next time I will put up a do not disturb sign and turn off the phone so we are not interrupted. My students were given a pen or pencil, access to a calculator and blank paper for writing on. I had one set of questions printed and cut apart so I could show my students one question at time. I also needed several copies of the diagnostic interview questions to write notes about the answers students gave.

To make the assessment fair for all of my students I read the questions out loud then paused for their replies. I noticed that a number of my students had reading difficulties, and I did not want this to get in the way of their mathematics learning or understanding. I found the next part of the interview very difficult; the **waiting**. Twenty to thirty seconds feels like a very long time to wait for a response, but it was well worth the wait. As a teacher, I want to prompt, hint, and scaffold the question for my students, but with an interview I realised this is not what I am trying to achieve. Instead I am in the role of an detective, listening carefully and making notes about what my students say and do. If students offer no answer after a minute or so, I would ask something like "What are you thinking about this problem?" If students cannot verbalise what they are thinking about or trying to do, then I would ask them if they would like to try writing an equation or if they might like to use the calculator. When my students were using the calculator, I found it to be really helpful and even insightful to see and record what they were typing.

Similar to the numeracy interviews, when students offer responses to questions it is critical to ask **how** they calculated their answer. I find it very difficult to not slip back into assessor mode and tell them whether they were correct or not. Even though my students might answer a question incorrectly, I noticed that my students will often self-correct when they talk me through how they solved a problem. I don't stop the interview when my students get on question wrong. I continue to read problems to my students until I notice that they are getting way out of their depth. I am careful to use the interview to gauge my students' thinking rather than crush their optimism by showing them how hard problems can get.

I tried to record my students' answers as exactly as I could. I coded their responses according to the strategy list below.

Codes for strategies are:

0 No strategy or inappropriate strategy

1 Known basic facts

2 Counting techniques

3 Inverse operation

4 Guess and check

5 Cover up

6 Working backwards then guess and check

7 Working backwards then known facts

8 Working backwards

9 Formal operations

Additional codes

s Self-corrected by student

/ Skipped by interviewer

c Student used calculator

D Diagram drawn by student

Terms that only applied to one-step problems

- Known basic facts
- Counting techniques
- Inverse operation

Terms that applied to two (or more) step problems

- Cover up
- Working backwards then guess and check
- Working backwards then known facts
- Working backwards
- Formal operations