Assessment for Learning: Using statewide literacy and numeracy tests as diagnostic tools

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Assessment of, assessment as, and assessment for learning

The Victorian Government’s Blueprint for Government Schools (Department of Education and Training, 2004a) promised the development of guidelines ‘to assist government schools with school-based decision-making in areas of curriculum development, pedagogy, assessment and reporting’. Subsequent draft assessment advice (Department of Education and Training, 2004b) suggests that assessment for improved student learning and deep understanding requires the range of assessment practices to be used including:

• Assessment for learning [which] is undertaken to ascertain students’ prior knowledge, perceptions and misconceptions and to monitor student learning progress … [and] to inform teaching practice and curriculum planning in order to support students’ future learning and understanding. (formative assessment)

• Assessment as learning [which] focuses on constructive feedback from the teacher and on developing the student’s capacity to self assess and reflect on their learning – to improve their future learning and understanding. (ongoing assessment)

• Assessment of learning [which] makes judgements about what the student has learned in relation to the teaching and learning goals. … [and] should be comprehensive and reflect the learning growth over the period assessed. … (summative assessment)

Assessment for, assessment as, and assessment of learning are certainly not new concepts. For example, Black and Wiliam (1998a, 1998b, 1998c) make little distinction between assessment ‘for’ and ‘as’ learning grouping both under the one title of ‘formative assessment’. They do, however, make a distinction between this formative assessment and summative assessment. Black and Wiliam (1998c) argue that raising the standards of learning has become an international priority but governments throughout the world have put most of their efforts into summative assessment type initiatives such as ‘National, State, and district standards; target setting; enhanced programs for the external testing of students’ performance; surveys such as NAEP (National Assessment of Educational Progress) and TIMSS (Third International Mathematics and Science Study); initiatives to improve school planning and management; and more frequent and thorough inspection’. However, Black and Wiliam (1998b, 1998c) argue that the impact of all these reforms have amounted to little. They, and others, argue that there is now compelling evidence to show that ‘the important message now confronting the educational community is that assessment, which is explicitly designed to promote learning [formative assessment] is the single most powerful tool we have for both raising standards and empowering lifelong learners’ (Assessment Reform Group, 1999).

The pattern of assessment efforts in Australia certainly mimics that of many other countries such as the United Kingdom and the United States in that each State Government conducts its own version of Literacy and Numeracy summative testing at Years 3, 5 and 7 (and will be extended to Year 9 by 2007) and the expenditure on these policy initiatives greatly overshadows any policy initiatives that promote formative assessment. Reporting of these data is dominated by summative...
type reports and accountability units around the country look at these data in terms of what they say about overall school performance.

**Using Statewide Literacy & Numeracy tests as diagnostic tools**

Despite this apparent incongruence between what the research suggests will have the greatest impact on raising the standards of learning (formative assessment) and the actual practice that most jurisdictions around the world have implemented (summative assessment), it is too often overlooked that summative type tests actually contain valuable formative (or diagnostic) information.

For example, in Australia, because each State bases its tests on its version of the national curriculum profiles and because each item on the tests reflects one or more outcomes from the State’s curriculum standards, responses to each item reflect students’ knowledge, perceptions and misconceptions with respect to the standard being tested.

Let us look at two items from Victoria’s English and Mathematics tests to demonstrate the use of Statewide Literacy & Numeracy tests as diagnostic tools.

Look at Table 1. It shows for each student at the school the response to each item. If a student answered the item correctly, a ‘tick’ is entered in the body of the table; if a student answered the item incorrectly, the incorrect response is entered into the table. Look at the highlighted item No. 6. The answer key shows that the correct answer is option ‘d’ and that the first three students (David Billsdon, Stephane Byrne and Anne Conlan) answered this item correctly. The fourth student (Rhonda Connor), however, gave the incorrect response ‘c’. Summary data near the bottom of the report shows that thirteen of the twenty-one students (or 62% of the group) answered this question correctly. Furthermore, the summary data shows that across the whole State, 59% of students answered this item correctly. In other words, although less than two-thirds of the students in this group answered the item correctly, this percentage was very similar to the percentage of students in the whole State.

More interesting, however, is to note that of those students in this group who answered the item incorrectly, all of them gave the same incorrect answer ‘c’. (This can be seen by either running your eye down the column for item No. 6 or by computing a tally for each response as has been done in the last four lines of the table.) By reviewing the item, teachers at this school can gain some very interesting diagnostic information about this group of students.

**Table 1**  
Student response report for Year 3 Reading
The letter from Paul clearly says ‘Please don’t give me any more homework’. Any student who gave the answer ‘a’ can’t even read for literal interpretations from this text. Most students would probably first approach answering this question by looking at each letter and trying to find a one-to-one match between the question and the text. For most students, matching up ‘Which student wants to some extra work’ with ‘Please don’t give me any more homework’ is a simple task and option ‘a’ would be eliminated easily. Although no one in this school gave ‘a’ as the answer, there were many in the State that did indicating a low level of literal reading skills amongst such students.

The letter from Alice says ‘Please don’t give us any more projects to do’. Matching up ‘Which student wants to some extra work’ with ‘Please don’t give us any more projects to do’ is a slightly harder task because it requires students to have a higher level of vocabulary understanding to be able to equate extra work and more projects. Again, although no one in this school gave ‘b’ as the answer, there were many in the State that did indicating a low level of literal reading skills amongst such students. It should be noted, however, that these students may be reading at a higher level that those students who answered ‘a’ – their problem may be more to do with a limited vocabulary.

The letter from Vlad says, ‘Thank you for all the homework you give us’ but makes no mention of whether or not he would like to do some extra work. The letter from Rosa says, ‘I am glad that you don’t give us homework on the weekends’ but does ask, ‘Please can I do a project on the solar system to share with our class?’. Students who answered either ‘c’ or ‘d’ can probably
comprehend the literal interpretation of option ‘a’ or ‘b’ and have eliminated them as possible correct answers. This places these students at a higher reading level than those who gave answer ‘a’ or ‘b’. What separates students who gave the correct answer ‘d’ from those who answered ‘c’ is the level of inference these students are able to make from the text. Those who answered ‘c’ are incorrectly making the inference that liking homework (‘Thank you for all the homework you give us’) with wanting to do even more of it. On the other hand, those who answered ‘d’ have been able to infer correctly that wanting to do a ‘project on the solar system’ means that Rosa wants to ‘do some extra work’ even with the distracter statement from Rosa that she was ‘glad that you don’t give us homework on the weekends’.

The diagnostic information from this item gives the teachers at this school some powerful information. If supported by information from similar items, it would be possible for the teachers to conclude that reading the literal meaning of text is probably a skill already mastered by all students in Year 3 at this school. Therefore, it would probably be a waste of time devoting too many learning and teaching opportunities to this skill. On the other hand, although about two-thirds of students can make correct inferences from text, making inferences from text has not been mastered by all Year 3 students at this school and additional learning and teaching opportunities in this area are warranted.

More interesting, however, is to note that of those students in this group who answered the item incorrectly, most of them (another 39%) gave the same incorrect answer ‘d’. (Again, this can be seen by either running your eye down the column for item No. 17 or by computing a tally for each response as has been done in the last four lines of the table.) Again, by reviewing the item, teachers at this school can gain some very interesting diagnostic information about this group of students.

Table 2 gives a Numeracy example. Again, it shows for each student at the school the response to each item. Look at the highlighted item No. 17. The answer key shows that the correct answer is option ‘b’. The summary data near the bottom of the report shows that seven of the eighteen students (or 39% of the group) answered this question correctly. Furthermore, the summary data shows that across the whole State, only 47% of students answered this item correctly. Although less than half the students in the State answered the item correctly, even fewer students in the school answered this item correctly.

Table 2 Student response report for Year 3 Mathematics
To answer this question, students need to employ at least two different skills. First, they must be able to match numbers written in word format with the equivalent number written in numerical format. That is, fifteen hundred means 15 lots of 100. Second, they need to have some understanding of place value. That is, 1500 signifies one lot of a thousand (which indicates 10 lots of 100) plus 5 lots of 100 (i.e. 15 lots of 100).

In this school, about 6% of the Year 3 students gave the incorrect answer ‘a’ (150) as their answer. These students show no understanding of either concept. No one gave answer ‘c’ indicating that the ‘15’ in 10 015 fooled no one. However, 39% of the Year 3 students in this school chose the incorrect answer ‘d’ (15 100), suggesting that while these students may be able to match numbers written in word format (‘fifteen hundred’) with an equivalent number that somewhat resembles its numerical format (15 100), they do not fully understand the concept of place value. That is, they have incorrectly read ‘15 100’ as meaning 15 lots of 100.

Again, the diagnostic information from this item gives the teachers at this school some powerful information. If supported by information from similar items, it would be possible for these teachers to conclude that place value is a concept not understood well by many students. Therefore, additional learning and teaching opportunities in this area are warranted.

Furthermore, some students, but not many, also have a problem matching numbers written in word format with the equivalent number written in numerical format. These students need to be identified and supported.

Interestingly, this item also appeared on the Year 5 Numeracy test as a link item1. At Year 5, 82% of all students in the State answered this item correctly and almost the same number of students in the school answered correctly. However, of the remaining students answering incorrectly, by far the greatest number gave ‘d’ as their answer; indicating that there are still a few students in Year 5 who do not fully understand the concept of place value.

Summary

Assessment of learning dominates assessment efforts around the world, and systems, whether intentionally or unintentionally, typically portray such programs as the best means of raising the standards of learning. At the classroom level, such programs are rarely appreciated and most teachers have little faith in either the reliability or validity of such State-mandated tests. While it is clear that school administrators take the results of such programs very seriously, few classroom teachers give any more than cursory attention to the results for their own class. This is a shame for a number of reasons. First and foremost amongst these reasons is that item-level results from the tests actually contain valuable formative information that could inform teaching practice and curriculum planning in order to support students’ future learning and understanding. Research suggests that much could be gained (in terms of raising the standards of learning) by supporting classroom teachers to make better use of formative assessment. One place to start should be to support teachers in using Statewide Literacy & Numeracy tests as diagnostic tools.

References


1 A link item is an item placed on two different Year level tests to aide in the establishment of a common performance scale across the different Year levels.