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OBE Assessment - a high-stakes innovation in schools

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The success of Curriculum 2005 *as an OBE system* depends on successful innovation in assessment practices

The assessment of learners' performance, judged against outcomes, is central to the stated policy of Curriculum 2005. Outcomes will function as organising concepts for teachers only if teaching is reorganised around assessing learner progress in terms of those outcomes (of which there are 9 for Natural Sciences). This is why OBE Assessment is a high-stakes innovation: if the innovation cannot change assessment behaviour in schools, OBE will be fundamentally damaged.

The scope of the assessment research and development project

This research explores the possibilities for introducing the intended OBE curriculum in science in the light of its dependence on extensive innovations in assessment. The project at present focuses on Grades 5, 6 and 7, with an eye to the implementation of OBE in Grade 7 in 1999. The project began work with 3 pilot schools in September 1997 and is designed to run for at least three years, taking in more schools during that period. The present pilot schools are an ex-DET school, a white-staffed "Model C" school and an independent school which has a mixed staff and mainly Black children.

The project takes the Specific Outcomes for the Natural Sciences as the basis for designing assessment tasks, and has begun with Specific Outcomes numbers 1, 2 and 3, namely,
1: *use process skills to investigate phenomena related to the Natural Sciences*
2: *demonstrate an understanding of concepts and principles and acquired knowledge in the Natural Sciences*
3: *Apply scientific knowledge and skills to problems in innovative ways* (which the project interprets as *Apply scientific knowledge and skills to solve problems which are unfamiliar to the learners).*

Aims of the study

The study has two main research aims: One is to describe teachers' interpretations of OB Assessment as they encounter it in a pilot programme. The other is to investigate the extent to which children can **use process skills** and **deal with unfamiliar problems** (implied in Specific Outcomes 1 and 3). This latter investigation relates to the problem of the missing level descriptors in the Curriculum 2005 document (discussed in the summary paper).

The operation of the project

The project must begin an OBE-like pilot curriculum in the pilot schools, in order to assess it: such OBE-like science teaching does not exist as a regular feature in the pilot schools. So the pilot programme is an intervention in which teachers are asked to implement OB Assessment based on some of the main requirements of the guidelines for assessment issued by the DNE. However, the pilot programme is responsive in that it is based on a learning cycle model. This means that the design calls for teachers and research staff to experience the same activities in schools, then to identify important aspects of the experience, reflect on their implications and then replan the next phase of the project.

In Phase 1, teachers were given the opportunity to become familiar with skills-based assessment tasks, working with "focus groups" of only six children and working alongside project staff who also had similar focus groups. Phase 1 ended with a workshop in which we reported on children's performance in the three schools and discussed issues of teacher expectation in marking children's work.

In Phase 2, the project has asked teachers to use these and similar assessment tasks to assess children under more realistic conditions i.e. about 45 children per class. This phase, like Phase 1, will incorporate reflection workshops in which teachers and staff can consider the implications of the action in the schools and adjust the programme.

Phase 3 aims at institutionalising some OBE practices, at enabling teachers to observe other teachers' learners during science lessons and at enabling teachers to adapt materials for use as OBE assessment tasks. We hope that project teachers will feel equipped to take a leading role in workshops organised for other schools.

The research questions
The research is guided by 5 questions:

1 What is the present state of assessment in the schools? We ask about formal and informal assessment, assessment techniques, the kinds of pupil output that teachers most value. (Focus of Phases 1 and 2)

2 How do the teachers interpret and use the pilot materials? (Focus of Phases 1 and 2)

3 What kind of performance do teachers expect of children doing science? And how do the children in fact perform in skills-based tasks? And do teachers' expectations of pupils change? Is there a match between their capability and the kinds of tasks teachers usually give them? (Focus of Phases 1 and 2)

4 What do teachers think of the outcomes approach represented by the pilot materials, as evidenced by their use, adoption and modification of the materials? How does this show up in questioning style and lesson organisation? (Focus of Phases 2 and 3)

5 Do teachers' approaches to assessing children change in the long run? What modifications do teachers make to the suggested approaches of the project, and what are their reasons for doing so? What benchmarks do they settle on when assessing performance tasks as done by children of different ages? (Focus of Phases 3)

The pilot materials
The design of the pilot materials was guided by a number of demands:

(a) The tasks must cover a range of skills such as comparing, classifying, recording, interpreting information, predicting from patterns, etc. The project uses a 10-point framework of process skills to assess.

(b) The tasks must form part of a teaching sequence and they must be coherent by being written around a theme. The initial tasks had to simulate the practice of continuous assessment during lessons (as opposed to formal testing). The "tasks must teach", as the slogan goes.

(c) The tasks must be motivating to the children, so that we can see the best that the children can do. We let the children work in pairs, on the grounds that each might produce better work than working singly.

Emerging picture of principals' concerns
One of the research team is conducting detailed interviews with the principals, and at the symposium will report on their emerging concerns.

Emerging picture of teachers' concerns and expectations

At present, the concerns we hear are largely around marking practices, the need to be fair to learners and to make allowance for what has not been taught. We will provide more detail at the symposium.

Preliminary findings about children' abilities in using process skills, and the problem of level descriptors

We will report on quantitative results and attempt some interpretation of the results. These results will, we hope, have a bearing on the development of level descriptors which will enable teachers to describe progress in outcomes.

The following section was not included in the text sent in for publication in the Proceedings

When we tested Std.2 and 3 children's skills in transforming information about plant growth from narrative form to tabulated form to graphical form, children in an ex-DET school and ex-"Model C" school showed very similar and unexpectedly good performance. A further important similarity was that in neither school were the children taught these skills (Thorne and Moodie, SAARMSE 1997). We concluded that teachers did not expect children to be able to do such tasks. An implication is that assessment innovations could be used to raise the level of expectations which teachers hold of their learners.

Example: the skill of interpreting information

The learners had four contexts, with 8 questions, in which to display the skills. In this extract from the project's skills framework, the skill of interpreting is made up of these sub-skills ...

5 **Interpreting information** Note: The information might be in prose text, diagrams, diary form, table form, graph form, model or analogy

5.1 knowing how to get information from a book, knowing how to learn from books / printed page. (Component of Essential Outcome 4)

- 5.1.1 cross-referencing information in books
- 5.1.2 finding info from knowing how a book is structured,
- 5.1.3 organising info using summaries or concept maps

5.2 changing *the form* of the information to another (prescribed) form (see **Skill 10 Communicating**, below. Such tasks are often good DARTs)

5.3 looking for patterns in recorded information

5.4 predicting (see **Skill 6** below)

5.5 interpolating for missing data

5.6 making an inference from given information (v. similar to hypothesizing) Also described as "drawing a conclusion" from information

5.7 perceiving and stating a relationship between two variables (Link with **Skill 9**, Fair Testing)

5.8 constructing a statement to describe a relationship between two variables, without assistance

Task	**Context for interpreting**	**Questions**
Seed count	Handling seeds, with different numbers of 6 different kinds	Apply concept of <seed>
Fat & starch	Food tests on bread, potato, sugar, peanut.	Infer from result of iodine test in 4 cases
		Infer from results of fat test in 4 cases
		Transform info. from statement to table form
		Infer from combined fat and starch data

How fast does the water rise?	Water transport by plants: a model, involving measurement of time and height, where water rises up tissue paper	Transform collected data from table form to graph form
		Perceive the relationship between height and time, expressed in a statement
An argument about seeds	Seed germination under warm vs. cold conditions; control of variables.	Directly infer a conclusion from results of germination
		Use proportional reasoning to infer a conclusion from results of germination under warm vs cold conditions

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