

28 May 2008

The Director GET Curriculum  
Gauteng Department of Education

## **Technology for all Pilot Programme for the Intermediate Phase – Report on the National Science and Technology Week event at SciBono Centre 13 May 2008**

In celebration of National Science Week, Setlhare Curriculum Trust and the teachers in the *Technology for all pilot programme* conducted a workshop for the “making stage” of the current Systems and Control project, at Scibono Discovery Centre on the 13<sup>th</sup> May 2008.

This workshop was Workshop Three for the term, and was different from the other workshops we hold, because it was designed to promote learning at more levels than usual:

– The usual pilot schools were present, namely Bophelo Impilo Community School, Bree Primary, Crown Mines Primary, Crown Reef Primary, Fordsburg Primary, Huguenot Primary and Mayfair Convent Primary School, together with the teachers who were Mrs Masekela, Mr A.S. Essy, Mrs V. Mafhala, Mr M. Nkomo, Mr O. Khan and Ms M. Kubayi.

*Mrs Masekela of Bophelo Impilo Community School*



– Each school had sent 6 to 8 learners from the Grade 6 classes which are in the programme, and

– Mr Thabo Nkopane, the Learning Area Facilitator for District 11 had had the idea to bring 8 teachers from schools in his district, as observers.

### Learning goals for the workshop

*Learners* wanted to tell an interesting story using an animal they designed and made. So they had to work together in teams of 3 or 6 to make the animals with moving mouths. They had investigated some models and techniques in previous lessons, but this lesson was new to them. The context was that they needed to entertain young children at an orphanage by telling them traditional stories using their model animals.

The programme teachers wanted to assess and teach the **Tech1** making-skills in this stage of the project, do formative assessment and use an observation instrument. They also wanted to teach or assess **Tech2** understanding of mechanisms and structures. This lesson was new to all the teachers and they were trying out the lesson with the 6 to 8 learners, as preparation for doing it with their whole classes back at school. (See the observation instrument in Appendix 1)

Visiting teachers wanted to learn about managing this stage of a project and they paired off with programme teachers, to observe them with the aid of a different observation instrument (Appendix 2). The observation instrument mostly focussed on the kind of questions the teacher was asking, what feed back he/she was giving and how the learners responded to the teacher.

The learners wanted to make an animal with a moving mouth, to tell a story . . .



The programme teachers wanted to try out the lesson with the small group and do formative assessment . . . (Mr Nkomo of Fordsburg Primary)



The visiting teachers wanted to find out how the programme teachers handle the making stage and assessment.



The teachers had the opportunity to practice formative assessment, judging the right moment to help or the right questions to ask.

*Mr Essy of Bree Primary in Crosby*



*Mrs Violet Mathala of Crown Reef Primary in Mayfair*



*Mr O Khan of Huguenot Primary in Crosby*



*Peter Middleton -- ex-PROTEC – the principal writer of the Technology for All course we use*



The learners had about 90 minutes to make the designs they had worked on in previous lessons.

*Mayfair Convent ..*



*Crown Mines working on their two dogs that argued.*



*Learners took turns finishing and decorating their models at the painting table..*



*The learners left their models to dry . . .*



The complex design of the workshop – i.e. different kinds of work and learning by children, their teachers and visiting teachers – worked well, largely due to the eager activity of the learners.

They had known since the beginning of the term that they had to use their animals to tell a story that reflected some traditional wisdom.

When the learners had set aside their models to let the paint dry, and gone outside to rehearse their stories, the teachers and programme staff had an opportunity to discuss what they had seen.

The learners returned and the room was set for their story-telling. This part of the event was a trial run of the evaluation stage of the project which teachers will be doing later in the term – these learners had to ask themselves, “Does our toy animal look good, does it help us to tell an interesting story to young children? Does the mouth move the way we wanted?”

*This dog ran off with a piece of meat; he saw his reflection in the water and thought it was another dog with a bigger piece of meat. He opened his mouth to growl at the other dog, his meat fell into the river and he became sadder and wiser.*



*This sheep kept crying out for help from the elephant, and then laughed when the elephant came to help. One day, the sheep was in real danger and the elephant said, “You have made a fool of me too often!”*



*A story about two dogs who saw their reflections in a broken mirror.*



*Vundla the hare is so confident that he goes to sleep during the race, then wakes and runs like mad to catch up with the tortoise, but he is too late.*



The introductory lessons in April made use of the famous story-teller Gcina Mhlope’s African stories, and the learners were invited to find more stories from their cultural backgrounds.

The intention was to that the stories would teach some traditional wisdom or refer to traditional knowledge. This was our approach to Learning Outcome ***Tech3-indigenous knowledge.***

Some of the stories were based on a resource containing Aesop's fables that come from an ancient but Greek cultural background. Teachers commented that children seldom hear traditional stories nowadays. Perhaps the language and Arts & Culture teachers should be made aware of this so that they can re-establish some of the cultural heritage of South African children. They could also stimulate their ability to create their own stories.

In addition, the programme staff felt that the learners needed more lessons on mechanisms as some of the moving-mouth systems were too basic. This has been taken up in the follow-on Workshop Four on 27 May.

### **Evaluation of the workshop**

The design was based on the Kolb learning cycle model that guides all the TFAPP workshops – that is, a repeating cycle of **action** in the classroom, **reflection** on that action together with other teachers who have had similar experiences, **drawing learnings** from the reflection which guides preparation for the next set of lessons and further **action** in their own classrooms.

In this case, the earlier action had taken place in lessons during April and early May and reflection was done in the workshop before this one. This workshop event on 13 May was actual preparation for teaching the making-stage lessons with whole classes in the days following the event.

The participation of the visiting teachers added an extra dimension to the event; they were observers who also asked the programme teachers to verbalise what they were doing as they taught and assessed the learners. We expected that this aspect would deepen the programme teachers' own understanding of what they do, and provide the visiting teachers with insights into how they might deal with technology in their own schools.

Because the event had to be completed in time for the learners to take the bus ride back to their schools, we had very limited opportunity to evaluate the event at the time. However, we did interviews with visiting teachers, Mr T Nkopane the D11 Learning Area Facilitator and programme teachers later.

Comments included:

- "The main thing I saw was that the learners and teachers are doing all the Assessment Standards and Learning Outcomes but they are using recycled material. For example, these children know how to make a strong structure out of paper – they know how to fold it or roll it into a tube to strengthen it. In a lot of schools teachers are not doing Technology because they say the Department has not provided them with technology kits." (Visitor)
- "Everything was practical and realistic in the workshop, we saw the teachers with the actual learners there." (Visitor)
- "I decided to do practical work on shapes with my Grade 4s and they cut out cardboard to make pyramids and so on. They enjoyed it so much they did not want to go home. . . . I will do it again, even though the noise gives me a headache!" (Visitor)
- One visitor said he was impressed by the whole event, noticing how the programme teachers asked challenging questions of the children. His strongest impression is that "everyone worked as a team. This is important if people are going to achieve goals." He enjoyed the discussion with Mrs Mafhala (programme teacher) and had made many comments to her; this sharing between educators is a reminder to him that "no man is an island". (Visitor)
- "The work and understanding of Technology can be easy if teachers work together as a group and share ideas; it can be a relief for technology teachers." (Visitor)
- "I learned about the categories of skills – measuring and marking, cutting and shaping, joining and strengthening, finishing and decorating and I know how I can fit the practical making into my class periods." (Visitor)
- "My guest teacher kept asking questions of me and the learners and this was stressful because I did not know the answer and to me she was like an inspector but afterwards I realised she did not know the answer either and she wanted to learn. . . . The next day in school those six

children helped the other groups and they were like six little teachers to help me.” (New programme teacher)

- “The children who went came back highly motivated and they told the class what they had done . . . . for these children, who were not the creams of the school, this was an opportunity to shine . . . this is very motivating for learners who are not academic.” (Programme teacher)
- “This was an opportunity to look carefully at what the learners do in the group of 6 and to assess them. With the whole class [it was harder] but I knew what skills to look for.” (Programme teacher)

From this informal evaluation, we believe that valuable learning took place at the level of child learners, programme teachers and visiting teachers.

In addition, the observed success of the design suggests a method of dealing with the issue of extension. Extension of TFAPP means using the action learning and Kolb learning cycle models to extend the obvious professional development gains to more schools.

The model is based on voluntary commitment of teachers from schools not too far from each other, participation in a common programme and in the longer term, mutual support of each other. The event reported here suggests that just as teachers can learn from each other and inspire each other, so groups of teachers could learn from and inspire each other.

Peter Moodie – Programme director

Thembeke Xipu – Programme implementer

Appendix 1 and 2

**Appendix 1 The assessment instrument on which programme teachers made notes**

The programme has been working on formative assessment for many months, and this instrument reflects only our attempts to teach and assess learners' skills in making the models (the Assessment Standard is Tech1 - MAKING)

In other technology projects we would have a column headed "Measuring and marking"; these skills deal with estimating sizes and proportions, literal measuring with a ruler, and marking pieces before cutting, so that they fit together.

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**Technology for all pilot programme Term 2, Structures and Systems**

Workshop 3 13 May 2008

**Looking for evidence of the making-skills**

A tick ✓ means I am satisfied he/she can do it at Grade 6 level; a ~ means I need to teach it to him/her or I need to see another example of him/her doing this skill.

Learner's name	Cutting and shaping	Joining and strengthening	Finishing and decorating
.....			

## Appendix 2 – The observation instrument that the visiting teachers used

### Technology for all pilot programme – Term 2, Structures and Systems

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Workshop 3, 13 May 2008

#### Noticing what teachers and learners do

Put a tick ✓ whenever you hear the teacher or learners speak, or when the learners make some response with their materials. You will end up with a sort of bar-graph showing what happened most often.

<p>Teacher <b>tells</b> or <b>makes a statement of fact</b> (e.g. "paper can take a heavier load if you roll it into tube" or "You must add a triangle here to make the joint stronger")</p>	<input checked="" type="checkbox"/>	<p>Notes for discussion later:</p>
<p>Teacher asks <b>recall question</b> (Can be answered by remembering what the teacher said in previous lesson. E.g. "What is the meaning of 'linear motion' ?").</p>	<input type="checkbox"/>	<p>Notes:</p>
<p>Teacher asks <b>thinking question</b> (can only be answered by observing, measuring, predicting, making hypothesis, inferring from picture, changing the model to see the effect of the change etc.)</p>	<input type="checkbox"/>	<p>Notes:</p>
<p>In response, the learner(s) <b>does something with the materials or tools</b>. (They might not say anything but for example, learner cuts material in a new shape, makes hole for pivot in a new place, adds triangle to strengthen a joint)</p>	<input type="checkbox"/>	<p>Notes:</p>
<p>In response, the learner(s) <b>answers with understanding</b> (e.g. he/she repeats what they have been taught, or predicts, or suggests another way to solve a problem, or they come up with their own example, they talk about a related situation, or learner says "Can we try this . . .")</p>	<input type="checkbox"/>	<p>Notes:</p>
<p>Learner(s) responds by <b>turning to the group</b> (i.e. does not say anything to teacher, does not demonstrate to teacher by using materials)</p>	<input type="checkbox"/>	<p>Notes:</p>