ADDENDUM
Lesson Planning
**LESSON PLANNING**

<table>
<thead>
<tr>
<th>Activity one</th>
<th>Needs</th>
<th>Time</th>
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<tbody>
<tr>
<td><strong>Activity</strong></td>
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<td>10 mins</td>
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<tr>
<td>Tuning in:</td>
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<tr>
<td>Bio diversity is the whole variety of living organisms, the genetic difference between them and the communities and ecosystems in which they occur. It is the natural wealth of the earth that supplies all our food and much of our shelter.</td>
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<td><strong>Biodiversity</strong></td>
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<tr>
<td>Think of an animal or plant that begin with one of the above letters:</td>
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<td>A story about the tree:  The heaviest burden from The Green Umbrella The pyramid</td>
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<td>Tuning in:</td>
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<td>Divide groups into six groups of five; Ask learners to name something they cannot live without and write on the board</td>
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<tr>
<td>Each group gets six tins that represent air, water, soil, plants, animals and humans. The learners have to arrange these tins into pyramids. Air, water and soil at the bottom, then plants and animals then humans at the top.</td>
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<td>Discuss which of the tins they can pull out without breaking up the pyramid</td>
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<tr>
<td>Add a sixth tin representing the sun. Let learners discuss where the sun should fit in. Provide them with a plank on which the pyramid will be balanced with the sun underneath. Explain that all energy comes from the sun and is captured by plants.</td>
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<tr>
<td>Which of these elements can we eat? Plants and animals</td>
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<td>Which of these elements provide their own food? Plants make their own food by using the sun, air, water and minerals.</td>
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<tr>
<td>Now relate back to what learners said they could not live without. Which of the tins would they be able to live without?</td>
<td>6 Sets of tins</td>
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</table>
Learners create their own flower. Apply what you have learned what is needed for successful pollination.

Where does the flower grow? Veldt or Wood? Wet or dry places? How will it attract pollinators? Does it need a special pollinator?

How is it going to ensure that the correct pollinator visits it?

Is the flower adapted especially to ensure pollination?

What would happen if the pollinator were killed?

**Activity three:**

To understand the role of the pollinator as well as the natural mechanism to ensure that pollination between species does not occur.

Flowers stand in a circle around the educator. The educator will be the pollinator and the flowers will try their best to attract the pollinator.

When the pollinator visits the flower there are three rules:

The flower must stick his pollen onto the pollinator. If there is already a coordinating speck of pollen on the pollinator then the flower may go and sit, as it is pollinated.

If there is no coordinating pollen on the pollinator then the flower is not pollinated and must still stand. The flower must still place its pollen on the pollinator.

At the end of the activity some flowers will still stand and will be the dead flowers. The flowers that sit are pollinated will have become seeds.

**Discussion:**

Why did the pollinator choose the flowers that were pollinated first?

What is the function of the pollen?

Can flowers use any pollen to make a seed?

How does a flower distinguish the right pollen from all the different kinds on a pollinator?
Learners create their own flower. Apply what you have learned what is needed for successful pollination.

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Activity three
Play the carnivore game.
Or play the carnivore game:
Activity four
Show bush School Video
Show learners the skulls of herbivores, carnivores and omnivores. Look at their teeth and the position of their eyes.

Group 2
Tuning in:
Plants make their own food and produces food. How do plants grow and make new plants so that we can have food?

Looking at flowers:
Why are flowers important?
*Flowers attract pollinators. When a flower is pollinated it makes a seed or a fruit. When a seed germinates it makes a new plant.*

Which product sells the flower
*Nectar is food for many insects, birds and bats*

Look in the garden at different colours and shapes of flowers:
How many colours do you count?
Which colour do you see the most?
*Yellow attracts most insects*
Which colour do you not see often?
Which feature do you think sells the flower?
Nectar is food for many insects, birds and bats.

Activity two:
Learners make their own flower
What was the function of the dead flowers?

How many different pollinators can you identify in the garden?

**Activity Four**
How does pollination help food security?
Take a walk through the garden and see if you can identify a monoculture garden and a diversity culture garden.

Which garden is the most attractive? Why?
Which garden is more sustainable and why?

What would be the benefits of a garden with many different species as opposed to a garden with only one type of plant?
*It attracts more insects*
*It provides yields for other plants*

**Activity Five**
See how many pollinators you can find. Give children a net to catch insects with.

How many different pollinators can you find?

**Insects:** bees, butterflies
**Bats:**
**Birds:** sunbirds

**Concluding activity**
Give learners cards with sentences. Learners have to decide whether the card is good or bad for the environment and then place their card in the appropriate pocket.

Each child will get a piece of paper in the form of a seed. Each learners will write what he is going to do as a pledge for a better environment. Go back and plant your seed.

*Resources: Energy: UNISA*
*Biodiversity: SANBI*
Complete the food chain using pictures from the school garden

Name:
Look at flowers:

How does it attract insects?

How many colours do you count?

Which colour do you see the most?

Which product sells the flower?

2. Make your own flower

Where does your flower grow?
Shade, sun, wet, dry place

How will it attract pollinators?
Colour
Shape
Nectar

How is it going to ensure that the correct pollinator pollinates the flower?

4. How does pollination help to ensure food?

What are the benefits of a garden with many different species as opposed to a garden with only one plant?

3. Can flowers use any pollen to make a seed?

What plants are you going to grow in your garden?
Interview with principal

Thank you for having me. It has been a privilege and a pleasure to work at your centre. I have enjoyed it and the reception has been so kind and you have been so hospitable, I really appreciate that. I think as you know from the letter of approval and other discussions that we had, that I am looking at what happened in South African classrooms before 1994 and what happens now, and also to get an understanding of the nature of critical education and its capacity to inform learning in environmental education in classrooms in South Africa. I want to see how the use of learning support materials can actually raise the levels of critical consciousness of learners, that they know that we are in a dialogue in our classrooms, it is not a monologue and that they have a voice and that they can exercise that voice so that the dialogue between the educator and the learner is of such a nature that they are also able to bring the knowledge that they have to the classrooms. And that we construct the knowledge together, so that both teachers and learners benefit from the learning and that it is not a top-down approach. And in the light of this I would just like to ask you a few questions.

What is your understanding of the concept curriculum?
Ok, that is defined by the National Department of Education and the National Curriculum Statements and the Assessment Standards. I think that is what the curriculum basically is in South Africa. That is my understanding of what we have to follow.

Do you think that there is a gap between the planned and the practiced curriculum and why do you think as you do?
You mean the planned curriculum?

Yes, and how it is practiced in our classrooms?
I think there is a gap, because there are lots of reports that the people are still doing the old education and they just apply it with the outcomes. They don’t transform everything,
but they are still using that old syllabi as the content to work from and changing their teaching methods.

So they are actually using their old content, but just applying OBE methods?
Yes, that is what I understand and you know, aligning it with the outcomes.

And what is your understanding regarding the methods of OBE? If you say that some people are using the old knowledge but new methods, what do you perceive as new methods?
Well, it is basically that they have to follow the curriculum statements and the assessment standards and the assessment standards describe exactly what the children should be able to do and usually also says that there is knowledge, skills and values, that has to be learnt in each lesson. So there are certain prescriptions that they have to follow to be able to attain those outcomes.

Do you see the methodology in the class changing? Do you think it is still a top-down approach, or do you find that the learners are participating?
Yes, I am not so sure of what is going on in all classrooms, so I cannot really say how it happens. I have seen some reports that the department is working with, where they are still struggling with getting it right.

And at your Centre here, how has the methodology in your classroom changed?
Look, here we really work differently. We don’t do a normal lesson. But what we do is that all the activities are interactive. The children can interact. When we train our volunteers, we train them that they are just mediators of the education. Whether that happens I don’t know, but I can still see people fall back into the old thinking, some of them. Many of them still fall back into the thing of, “I am giving the information” and not being the mediator.
But that is actually what you are trying to achieve?
We are trying and I think that some have witnessed that they are really doing it in the right way.

I have looked at your lesson planning, and observed your lessons. Do you work according to the curriculum, in the sense that you plan according to the outcomes that are set?
Yes, we are trying to actually be like an outdoor classroom for the schools. They can bring their kids here. What we do here is what they should do in the morning classroom, but we are just going to do it in the environment as a context and at the same time teach those values and skills... We use the environment as the context, I think what OBE ascribes is that there must be a context. It must be relevant to everyday life. So, we are taking those concepts of the waste and the energy and all that, bringing it into those learning outcomes where appropriate, and we are really trying to work according to the levels that the department has set now for each grade. So we try to make it grade specific. The teachers must come here and find that it is worth their while to come here in the morning and then the children get a little sheet that they can complete, which they can be used in their portfolios. So it is doing their curriculum work here.

So do you link to specific learning areas, or do the teachers go back and link it to whatever they are doing?
Our lesson plan is there and it is specifically linked to a learning area and a learning outcome and an assessment standard, so that they can actually see that we are doing that work.

And do you find that they actually build on what you are doing when they go back to the classrooms?
That is what I don't know, because most of the time we are using the natural science area or the social science one. Then the idea is that they should actually come here when they are busy with a certain topic, because the natural science learning area covers life and living. It's 4 strands, but they are all doing the same Strand the one term. Life and living
is what we are doing in the biodiversity room and they do it actually in the third term. But, you know, teachers, I don’t know. In the beginning I had a little bit of feedback when I taught the classes myself, and I interacted with the teachers. I asked them if it works for them in the classes. Do they take it back? And they would say that they would do soil and we show the children these things and we build on it a little bit at school. I don’t know how many times, because I don’t know how often that happens. I tried in the beginning that it should happen.

But it is difficult for you to monitor?
Yes, it is difficult to monitor because I am not in the classes all the time. I have trained the volunteers to do that and the teachers must give feedback, a questionnaire that they must complete after each session, that they must say whether they find it relevant or is the knowledge relevant and so on. And usually they give a positive feedback, most of the time.

So you trust that they are applying what they have learnt here in the classrooms at school?
Yes, many times they would say things like, it is good for the kids. But I am not sure…

In other words that they apply it when they go back to their classrooms? But they seem very keen and interested when they are here.
Yes, they are very interested when they are here, but I am not so sure what happen in the classroom. I have not done any follow up work on that.

So that might be a new area for research?
That can be a very interesting area for research, yes.

In other words how they actually apply what they have learnt here.
I just want to show you some of the feedback forms.
It might be a good idea if I could have a few of these feedback forms to maybe add to the study.
Yes, you are welcome.

It will give us an idea of the perceptions of the teachers from school.
The first one is an evaluation on the facilitator and the second one is on the program. So you can see that we have 87% average that they give us.

[Which is excellent. And I found the same when I spoke to some of the educators while I was observing the learning activities. They were really positive and really very keen]
And then, how do you apply the curriculum and do you deviate from the prescribed curriculum to accommodate the needs of your learners?
The curriculum is not so prescribed; the curriculum is actually so flexible that it can accommodate all... OBE should accommodate the needs of the learners. So when they do the assessment they are supposed to look at all those 7 multiple intelligences and then accommodate learners in that way when they assess them. So, yes with us we are doing... I can’t say I do it consciously, but we have games, we have things that they must draw, we have things where they do drama, we have things where they play a game.

To accommodate the 7 forms of intelligence you are actually making sure that there is a little bit of each in the learning activities, to accommodate everybody?
Yes, we wanted to be interactive... it is active learning here. We are doing active learning.

I actually perceived this when we were out in the garden and they had to make music and do a little song, you used the garden implements as instruments. And they just loved it. It was actually so creative, and I actually thought that it is a very good idea for the music intelligence ones. You could see the learners that are strong in music sort of coming forward and leading and help composing the song.
Yes.
[Interruption]
We let them feel and touch. We always say the 3 T’s: talk, touch and think, those 3 T’s. So there must always be something that you can touch and there must be a dialogue and there must be the thinking component. So we are trying that always. Sometimes they have to read something, and then you find that the children struggle to read...

...because it is not in their mother tongue, the worksheets?
So that is why in those cases the teachers might read the things for them or they might interpret for them what they are reading.

Could you tell me more a little bit about the idea of code switching were the educators present both in their mother tongue and in English? What is your thinking in this regard, why do you do it that way?
Here with us, I find that the volunteers do it in their mother tongue. Especially the younger ones [learners] and even the older ones they themselves are not that capable of talking in English. So they always switch over, even if it is grade 8’s and the grade 8’s is very much fluent in English. The code switching might happen when they read something and the teacher explains to them in their mother tongue.

How do you feel about the knowledge that they have gained? Do the educators reflect with the learners on the knowledge at the end of the learning activities?
Yes, that is what we encourage them to do at the end. We always have a conclusion.

Why do you think the conclusion is important?
Because you have to bring all the ties together, tie everything together, and you have to see what the children have learnt. You have to assess what the children have learnt. We usually ask the children what is the one thing that they can remember of today. And then we just reflect on the whole morning’s activities and sometimes we give them a little assignment that they must take home, like for the grade 7’s they must go and make a poster, with the grade 8’s they must write a magazine article, but we haven’t seen much of that happening. It is very difficult to monitor.
It is very difficult to follow up, because you don’t see them...
We wanted to have a competition doing an article but it hasn’t realised.

They are not keen on that?
Yes, we have lost touch.

After your reflections, do you find that you actually adapt follow up lessons? Do you find sometimes that the lesson is too difficult or too easy and that you adapt the follow up activities or not?
Look we can also do the reflection with the children and then also with the volunteers, usually when we do a new program we would reflect... we would ask them how did this work, how did that work and so on. And then they would give input and say this didn’t work for us and we must change it this way or that way.

I think you have answered this in a certain sense, but I want to know how important are learning resources and specifically learning support materials (LSM’s) in your teaching and learning at the EE centre? What role does it play in a learning activity?
Look, for every learning activity we have learning support material, it might not be a book or a textbook but it is always something that is like a thing that is part of the education. It might be, in the waste room, it might be the wall about the waste, or in the energy room it might be the sun stove or different things. In the Biodiversity Room the resources would be the things the children use to go and do their studies outside, the nets that they go and catch insects and there are worksheets that they must answer. So yes, everything is supported. The programme cannot run without the resources. I mean that is actually the most important thing and they are designed in such a way that they are interactive.

And do you think that the learners can actually apply some of the knowledge that they have learnt here? You have mentioned the sun stove, are these the kind of
things that they can apply in their everyday life and in the community in which they live?

That is what I encourage, but it is not always that easy. Because you were doing the Biodiversity Room, and the Biodiversity Room you really want them to understand the magic. They must come and see the soil, the compost and actually understand that this is real magic happening here, so that they can appreciate it and value it, that it is really something that they can care for. And then after that, then that is when we hope that people will start to appreciate the soil and do something. Because now we don’t waste in the street, why don’t we waste in the street? You must first know why and that is why we deal with the appreciation first. So to get the message across that you must save water, you must first give them the respect for water. Where is it coming from? Why must we look after it? And if they get that, they understand better why they must look after it. But if it really happens after this... it is a long way to go. Especially the waste, one thing that we are looking at here is the river. The river is full of pollution and how do we stop people from polluting the river? So the children go there and they do a little study at the river and see the magic in the water and realise that there is more going on in this river than what they ever thought of. And then we tell them to go pick up the papers and clean the place. Whether that happens, I don’t know.

Yes, I am sure it is difficult to determine, because it is not the same as in a school were you see them over a long period of time. You might see them once or twice a year?

Yes, but we do action projects as well. We don’t just leave it here, we do projects where they have to go and clean the river physically or where they have to go and plant something. Those are the types of things that we try.

[Yes, to keep everybody involved] Do you get other members of the community involved as well or only the learners?

Yes, we do. We can’t address the waste problem if you don’t address the community as well. So we have community workshops also.
Then lastly I would like to ask you, how are learning support materials selected for activities and how do you select the themes? How do you decide what you are going to do for example with the grade 5's in Biodiversity?

We are really going according to the curriculum, what is prescribed. Because I mean you have it now. That is really difficult, because we have grade 4-6 and you have the curriculum for grade 4-6. I actually went and looked what teachers do and now the Department has actually come up with some kind of structure, that this is what must be done in grade 4, this is what must be done in grade 5. So this helps a lot. But still things overlap and so on. Say for instance I want to teach about herbivores, carnivores and omnivores, they are supposed to start in grade 6 now. But I teach it to the grade 5's anyway.

So it just prepares learners?

Yes, so I don't think it matters too much. Like soil, they are doing it in grade 5, but I only do it in grade 6 because I find the children have to read a lot of things and a lot of technical things that they must understand. There I find that I work better with the grade 6's.

So it is by trial and error as well, to see what works?

Yes

So you work according to the curriculum but you also see what works in your classes?

Then I have a sensory trail. You haven't done that, you haven't observed that...sensory? I did consult a teacher and asked the teacher what she thinks.

Do you find that the learners are keen when they come here? Do they enjoy the learning? What is your general perception? Is it a good way for them to learn, using real life objects?

I think they enjoy it. We also try and make it fun as well. Otherwise the children, you know, come here the whole morning. It is a long stretch and you have to put in some fun as well and to get their limbs loosened up and a little bit of running here and there or something else so that it doesn't feel like a real class situation. You know something that
they enjoy. They usually enjoy the activities here, especially the games, it makes them excited. We teach them while using games. One of the things that we do is “how does waste get taken to the landfill?” It is a whole animated thing that we do with them and they play this little game and they learn while playing.

Thank you so much and for the input that you have given me.
Interview with educators

I just want to say thank you for having me and for always being so friendly and accommodating me. It was an enormous privilege being here with you at the Centre. I admire the work that you do; I’m just so impressed and thrilled. I would just like to talk to you about the lessons that I observed.

You were the people that presented the lessons and I would like in the first instance to ask you:
How important do you think learning support materials are in the learning activities that you present?

We think it is important because it is practical. They use resources and materials that are available to them. It makes it easy for us to teach and it makes it easy for students to understand. It is not like you tell them something that they cannot see. It is possible for them to forget that, but using their hands it is easy for them to remember, so using those materials is important.

Would you like to add anything? Why do you think it is important to use these learning support materials?

It is making the job simpler for them, and they will understand clearly. And having those things at hand it makes your job much, much simpler. And you can give more examples, especially the examples of those things that we are using at home and we are still using them again here, so it is knowledge that will not forget easily because you making use of it everywhere. Everywhere you go you find these materials. And it is then that you recall, oh I have done this, I fix this, I am doing this, so it makes it simpler for us to work with these materials.

So do you think that the learning support materials that you use here, links to the learners everyday lives, when they go home in the afternoon, and that they can link what they have learnt here to what they when they are at home?

Yes, because they have... for example waste, they have it at their homes. It is where they must think where to take that waste and it where they must think how to separate the waste, what to do with the waste rather than taking it into the streets. So it is important that they can link it, even like
soil erosion. Soil erosion can happen everywhere in their streets, to their houses or the space around their homes. So they must think what to do with those erosions in their homes and into their streets.

Yes, to add to that, the learning support material, I think, yes it is very important. It encourages and it motivates the learners to participate.

So if I can ask you, why do you use the learning support materials during your learning activities? I think you have answered that to an extent, but do you think it is to the advantage of both the educator and the learner?

Yes, it is because when you give them the material you don’t just teach them; they must think what to do with the material. It is easy for us as facilitators to use these materials and for the learners they are more active, they participate more, because they have something to do, rather than sitting and looking at you talking for the whole hour. So it is important.

The learning materials must … also be so that learners must be able to relate to certain things, because the material is provided for them. So it is simpler for them to relate. Hence the teachers and the educators, it is easy for them to adapt these materials and use the same methods the learners use in schools.

It also minimises the efforts that you as facilitator go to. You do not have to go through the whole program as it is. Lets say you are given the instructions and the resources, maybe to experiment whatever experiment it is, it becomes quite easy and you can see that the learner can integrate the theory and the practice. Does the learner understand? You only monitor, you no longer do the full facilitation.

We always say the learners must acquire knowledge and skills and develop attitudes. What is your opinion on the attitude forming? Do you think you are actually changing attitudes in these learning activities?

Yes, I can say that in a way we are creating critical thinking. The learners get it from the materials they are working with. These materials are playing an important part. The learners are no longer thinking the way that they were thinking before. It is changing. So the learners are thinking critically. It [the learning] becomes more effective for them. And then again they are gaining a lot,
because then you get challenges from then, and they come with all sorts of different things, all sorts of questions through these things and it is by these things that you realise it is working. Because look at the children, I am no longer spoon feeding them. They are telling me what to do, they are telling me which way can I still use the materials. So those opportunities they are there. And you don’t have to say to them you do this with this. No, you just ask them, what can you do with this? One thing about waste, just ask them what you can do with this. Someone will say I am going to make a wheel for my car. Then the other will say no I am going to make a helicopter. You see, the learners are thinking, critical thinking is increasing. So it is much simpler for you. Your work is no longer that much. That is how you relate with those things that you are making use of. So it is very nice.

**Do you think that it makes the learning more interactive, that you are not talking all the time and that you are getting the children involved?**

Exactly.

We are more involved with the children with things, with the materials, that is when you are having fun. You have to have fun with those things, with the kids. Because when you have a long face with the kids you have a problem. You have to like smile with them, cooperate with them, understand them before you can come to yourself. You have to understand the kids, you are working with kids. You have to understand that. So it much nicer, it is beautiful.

You have to mould them, because when they want to buy snacks, they just eat them and they just throw away the plastic, but if they know that someone can earn a living out of the plastic that day, they know that they can take it to him and save as much plastic and then certain Wednesdays, Thursdays of Fridays when the recycler passes by they can give it to him.

And again they know that they are doing great and their attitude has been changed for life. Let’s say that today they come for waste programme and tomorrow when they come for water programme, they bring along the waste from their homes so attitudes are changing.

**So you can see the results?**
Yes finally, you can see the results. Like sometimes it amazes me, like asking them with the plastic thing. Like asking them what can you do with the plastic bottle, instead of throwing it away? It is whereby you see that the kids start to think more, they start to think critically. Like, one would said I am going to make wheels for cars and one can say I can do a plane and one can say I can do this and do that, and it's so surprising to me. Some kids they didn't notice that before, but usually they are doing it at home, but they never thought that they are re-using or recycling. But automatically as we go through the program, especially waste programs, then they start to change their attitude, realising that if I'm doing this now, by re-using the container, I am re-using, you see.

Again on attitude, last week we were having a group of students here. They even left their containers on the grounds, because no one told them not to waste. And then today I told them to clean up and now it is clean, they were eating but left our grounds clean. So their attitude is growing.

It is wonderful, that is what we are trying to achieve. The learning outcomes that are set in the curriculum and that are interpreted for your learning activities here. When you plan these activities, you have certain things in mind that you want to attain. Do you think that the support material contribute significantly toward these learning outcomes? Would you be able to obtain the learning outcomes without these learning support materials in the activities that you present?

Yes, but it is going to be tough. By using learning material it is easy the things that we are going to attain.

Yes I can say by using those things it is making the work much simpler and easier and you are saving time. By using these learning materials you are saving at the same time. If you don’t use it still you can attain what you want, you can still get the same results, but with different attitudes, different ways of thinking. So you need to use the materials to make the lesson more interesting more fun. That is why we need to work together as groups, get them to do things together, to know how to do things for themselves, to know how to make them think with these materials. So again the materials are playing an important part. In a way you can say, there is no way that you can work without them. But with them it is making your work simpler.

I recall on of you mentioning earthworm, that some of the children have not seen an earthworm, and what are you thinking of using the real objects?
Yes, by using real objects it makes the learning practical. Why it is practical it is realistic. It is based on life. It is that in future he or she might educate her kids. It is really realistically based, it is there in life, you know.

And again using those materials, for example, I will give the example of biodiversity. Biodiversity is about the different species living together. But they don’t know what are the different species living together. So they need something practical to see and interact with. Because having those material and thinking of using those materials...I don’t know how to put it. But having the material in your hands is easier. Ok, for example again, of the earthworm, we said to them everyone can make the soil fertile. And then we must show them an earthworm and how earthworms work in the soil and going in the garden and showing them the earthworms and showing them what the droplets are doing, and because the soil is fertile we are planting there. So they can say, oh ok the result of the droplets from the earthworms is for growing the plants and vegetables. So it is making the learning to become more interactive and we are achieving a lot because of using those materials and it is working.

It is nice when theory can be applied in practice. The more you get the kids to be active, automatically you achieve more learning. And you could see by the way they reflect and it makes the kids to learn more easily. It makes it easier for learners to recall and apply knowledge.

On the learning support materials, I think the learning support materials it also helps the children a lot, because if you are going to put white paper here, a red paper, a black paper and then ask the children which paper requires the most chemicals to clean, or which paper requires lots of energy to clean. But the method that we are using here to teach them, using those same papers, in a way it becomes simpler to change their behaviour and attitude towards paper and towards the environment as a whole.

**Then I think we have spoken about this as well, but do you think that the learning support materials promote the learner’s critical thinking skills and why?**

I think it is promoting critical thinking as he was giving the example here of the different kinds of paper. When they can see the dark colour and the light colour and maybe take a pen and then write on the white paper and then write on the black paper. Then they can tell you, the writing on the
black paper isn't even visible. It is better, it is cheaper to clean the black paper than the white paper. In a practical way they are looking at the different learning materials at the centre. And then again having the material on the table, even if you don't tell them what to do with the material they can think, ok because I am having the soil here, and I am having 2 stones, it is soil study that we are going to do. Having the 2 stones and a spoon, what can I do with those things? They can easily think, ok I can rub these and then I can see what is the result. And then I have the other activity here for waste and then we put the bean on the scale and the waste, and then I tell them how many kg’s do the objects weigh? How many kg’s does the bean weigh? They must think, ok I am doing something wrong because the scale is not working because I cannot see the number. Ok I can take the scale and put it outside, it is faulty. [learners then realise that the bean is so light that it does not even register in kilograms] So they must think, they must use these materials to think for themselves.

So they must make a plan, you are not spoon feeding them?

They come up with the ideas, their own ideas to find out whatever the required answer is.

As I said at the beginning it's developing their critical thinking, to think big. They are no longer thinking small, because of these learning materials that they have in front of them and at hand. Then by having these materials it is easier for the learners to think more. So they can know from the beginning, they can think about certain things, they can think of many things they can do with one thing. They can think of reducing and recycling material and take these cans to the people who are buying them. But because of the knowledge they gain learners think about recycling those things and they come up with solutions to problems. That is why we don't spoon feed them with the information. The learning materials help them to come up with their own solutions, things that they didn't know. The use of learning materials increases the learners' thinking skills and they start to think big.

I want to refer to the water program that we run. It is here that you see that kids love to be in charge, they like to be involved. They like participation a lot. We would for example give them an experiment of purifying water. We look for volunteers, we choose volunteers, the learners would for example volunteer to participate as time keeper, one person who is going to read the instructions and one person who is going to pick up the stuff and one person who is going to help others to clarify the instructions and explain to other kids. It is here that you see that the critical thinking is
playing a big role, a big role because you will see learners having a serious conversation with each other and coming up with clever ideas, wise ideas.

And again in the water programme, we have a problem with water quality and the amount of water that we flush away everyday in the toilet. So we ask the learners, let’s say that you maybe go to the toilet 5 times per day, that means that you are flushing 9 litres 5 times. So we tell them what the problem is... we want to reduce the amount of litres that you flush everyday, how can we reduce the waste, the use of water in the toilet? The think, they think very well, they will say I won’t flush it again, I will just use a bucket of 2 litres, or ok, I will just close the tap there and pour the water inside the cistern. They think, even if they don’t come with the right answers, but they are thinking of solutions.

Critical thinking.

**Do you also find that you are also learning from the learners?**

We are learning a lot. It is fun and at the same time you are experiencing various ideas from various kids.

**Are the learners bringing knowledge from home to the classroom?**

Yes. It is quite relevant to their everyday lives.

Do you know the program that she was speaking about? I remember asking one of my groups, in this learning activity how we can save water in the system. One said, I can flush and stop. I said no, you are going to break cistern. Then the other said I can pour a certain amount of water in the cistern. No, how are you going to do that? The cistern is ceramic you are going to break it. Come up with another solution. The other one said you can put a brick inside there. Then I said that when you put a brick in the cistern it is going to get wet and then it is automatically going to dissolve, it is going to become sand inside there. Then the other kid said, no if you put this thing like this in here it is going to block the system. You start interacting with each other. The other one said no we can put a plastic around the brick. Then I said that is the solution. Take the plastic and wrap the brick and put sellotape around it and put it in the cistern. You are still saving water. We had another example where the learners put less litres of water inside, and they come up with another solution. And we learned something from them. You always interacting with them, you
are always learning from them because they come up with different ideas. We are not all living in the same way; we are not living in the same environment and the same place. So by having a word with the students we learn a lot from them. Others they come with questions you didn’t know. But then you go and find out about this and get the answer.

You find yourself challenged.

And then learning becomes exciting?

Yes, ja.

You have answered this to a certain extent, but maybe we can just reflect...I know you have spoken about the river or the stream that passes through the garden of the Centre. Do you think it is important for learning activities and learning support materials to link to the real life experiences of the learners and why do you think so?

Yes, we think it is important because for example locally we have a problem of waste on the streets and then when the rain falls it washes the waste into the river. And then that is a problem for the aquatic animals. So having these children coming here and then giving them an idea of how to solve the waste problem. I think it is important to the real world, because those illegally dumping on the streets are often their parents. So having this knowledge of how to deal with waste will benefit the aquatic animals in the river.

I remember saying to you last time, that having a Centre like this as a privilege for these students because by having a Centre like this they have different learning support materials available inside the Centre. I can say all of the things we are talking about in Biodiversity are available here. Here we have birds, we have people, we have animals, we have all sorts of things living together and you learn from them. Unlike having a book telling them about something that they don’t see, which is a bit difficult for them. Sometimes they don’t believe you, it is just information. But because they see it now they become more challenged and say no this thing is helping us. So by taking care of these trees I am saving my air. By not burning stuff in the street I am not polluting my air. So these things become more relevant to them. So we really need these kinds of centres for the students to
have this kind of information because here they have it practically. Some of the knowledge that they are acquiring at school, is theoretical, but here in the centre it is practical. They see these things, they see the kinds of animals, they see the plants living together, all kinds of things, all sorts of things - we have them here. We show them these things and they are challenged. And that is whereby they gain knowledge and then when you show them again you are going to learn something from them because they are going to come up with something, always.

Again, we make compost here that is used as manure to grow plants. The learners need the vegetables for their health and for the home. Most of the schools have gardens and it for those children; it is the children who build the gardens for their schools. But again they can even take this information home to plant vegetables. Instead of buying vegetables they can take from their gardens. So they can apply the knowledge at home, even though we don’t go to their homes to check if ever they are doing it.

In a way as she said it is the kids that are growing the plants in their schools. So they get like she said the compost, we give them the alternatives instead of using pesticides, we ask them what can you use? Instead of using spray and poisoning the plants and the soil, there is life in the soil. We give them things that are real to their world.

Again to add to the problem we spoke about of having waste on the streets, we tell them you cause a lot of problems because it was raining during winter time, it was not like that before, because we were experiencing rain during summer and cold during winter. So we tell them, many of those waste materials have chemicals and when it burns it ends up polluting the environment and we end up explaining about global warming. So we tell them the example of seasonal changes and they become afraid, but they know and think that what we are doing is wrong to the environment, it is wrong to our health too. So they can link this knowledge to their real life.

Excellent, yes if I check what she said. I am referring to what she said. Locally it is locally based, this problem of waste it is a very huge problem in Mamelodi. You know, with the stream and the waste. Maybe you find that kids do not know that is there is life in water, for example plants and aquatic animals and certain plants that depend on water. So we usually have a cleanup week. We don’t just get the kids to clean the rivers and the dumping sites. We also give them the information about what is living in the water, so that they reason for themselves that what they are doing is harming the environment and that it is not friendly to the environment. So we are just giving them information to see the environment from a different perspective.
They test the quality of water beforehand and we have material like fishing rods and buckets so they can fish out the animals and then they can see we have different animals in the water, and then afterwards we tell them ok imagine if this animal swallowed the paper, what will happen to this animal? Oh it will die. So we want to save this animal, what can we do to save this animal. So they say, oh remove the papers from the water. So they are thinking and sometimes they see there is dead fish in the water. Then having these activities to think and relate to the real world because they want these species in the water and they enjoy seeing them and sometimes they are surprised to see them. Then the learners realise that having these species is a privilege.

I also once had a learner who liked the dragonflies. She never knew that these flies grow up in water and that they depend on water. They can live in water, but they can also live outside of water. She didn’t know that, she was surprised that at this age, at this young age that the dragonfly looks like this and then it develops and then it changes and it becomes a fully grownup dragonfly. It starts as fly. She was so surprised and that also changed her attitude you know. Next time when she sees a paper or she throws it, she will think twice before doing it knowing very well that it will end up in the river.

And then lastly I just want to ask you if you find that children from different schools, I know you have an eco school here as well in the vicinity, have different needs? Do you adapt your material to suit the different needs of these learners or do you find that you can use it as is, and that everybody understands? In other words are they on the same level or do you adapt the learning to suit different learners?

We adapt the learning, but not for learners from the eco school. Some of the learners are a bit slow into the program. Some are fast and it is depends where they are coming from and the different school situations. So here, when we do the introduction it is here that we see that these learners are more active or less active and if they are less active they need much more information and if they are motivated I will just give them the introduction to each of the activities. So we try and adapt and then the children from the Eco School are better equipped because they have the learning support materials in their gardens and in their school yards. Like for instance waste, they have the recycling bins at their school. So it is not a big job for us to tell them, ok into the plastic bin what can we put in? They already know about that. And then with the different species and the biodiversity, they know because they have the various species and the different plants, and the
different flowers. It is easy for them to understand our activities. But for those who are not from the Eco School we try to help them, to give them more information that they can take with them.

Especially for those coming from the Eco School, I can say that you have to add something that they don’t know yet. You challenge them to come up with a solution to a problem. You must give them something new. You come up with something different that is going to challenge them, then by so doing you are winning. Every day you have to win, you have to tell them…so that when they come out of here they have new information. Some information comes from them from their critical thinking. So you don’t spoon feed them. And the other ones that are not from the Eco Schools you give them information; you let them think on the information that you give them. So by so doing you put them on the same level as those ones because you give them information that those ones are having and the ones that they not having, you combine them and come up with something. At the end of the day, that is why you have a conclusion. You summarise everything that you did. In the class I always say that I want one kid from the group that can come and summarise everything that we did. You will see what they have learnt. If one kid has learnt this much, ask yourself about the other ones. So you know that you are doing a great job. I cannot say that I haven’t made use of this, I did it now. So we are winning with the learners and I feel I have done a great job. I have also learnt something from them. You see from the situation that you have a relationship with the students because they are coming from different families, different environments.

So you are saying that you are winning, do you see that as pertaining to the learning outcomes that was set at the end of the lesson? Do you think that it was a successful lesson, how do you measure it?

Yes, by asking questions and giving them things to do. You come up with different strategies of making sure what we have achieved with them. If you ask them questions automatically at the end of the lesson they are going to give you answers. You can see, ok they’ve got what I wanted them to learn. If you ask them to do something for you themselves at the end of the day, even if I give them a paper one is going to this and that, and in the end of the day they are going to reach what I wanted them to do. You can recycle or you can re-use the paper; build something out of this paper or you can put something on top of this paper instead of wetting the box. So the learners apply critical thinking.
Yes, by having a conclusion it is actually whereby we see that they have learnt. They have something that they can go home with. Sometimes we have a small competition after the program where we can to see that indeed they learnt something, that they have gained something. And I think they gain a lot, because at the conclusion, even if they cannot answer exactly what you wanted, not because they were not listening, they did gain knowledge. You can see others coming with this solution, ok I have learnt this, I have learnt that. And by so doing it is where we can see that they have learnt much. And you know, teaching a child you are teaching the nation because they will grow with this knowledge in mind. But this is the environment where they are learning.

I have experienced that the kids with the background of Eco Schools and the kids who don’t have that background of an the eco school - it is quite interesting when they are together, because of the kid who doesn’t have more information he feels excluded or she feels excluded and less engaged. Kids they like to know more. So when we do have the kids who have more knowledge it helps them to engage with the kids who don’t have the same knowledge and everybody learns.

I really want to thank you, that was the last question and it was a wonderful discussion as always. Thank you so much for having me and all the success in the world with the wonderful work that you are doing here. It was really a privilege being here, thank you very much.