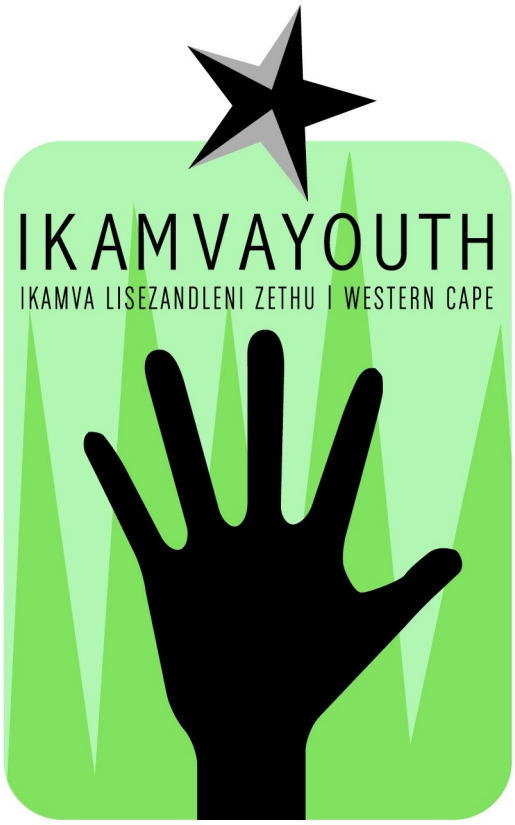

IkamvaYouth, Makhaza Branch
Report to Education Without Borders
Maths, Yes We Can Project

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1. General Overview and Thoughts of the Programme

One of the great mathematicians, John Louis von Neumann once said:

> *"If people do not believe that mathematics is simple, it is only because they do not realise how complicated life is."*

This quote resonates with me because it challenges how our society thinks about maths. I feel The Education without Boarders (EWB) program highlights the simplicity of mathematics and emphasizes the critical importance of foundational skills while acknowledging the complicated challenges and circumstances of life, which many of our learners are coping with.

This is has been fantastic program that promises to make a profound difference not only in learners' maths results but also in other areas such as boosting their confidence in their existing abilities. This allows learners to approach new learning experiences with a much more confident focus on learning. And that makes them much easier to tutor.

Because the EWB program still relies heavily on the tutor-learner relationship to facilitate learning, our students gain not only from being taught academically, but they are exposed to real verifiable positive reinforcement and encouragement during their learning that can only be provided by another human being (i.e. the tutor). This worked very well when teaching the Grade 8 learners the basic foundations they needed to solve the more complex topics of mathematics.

It has been a great year with its up's and downs. We had learners showing amazing improvements in their grades and developed a culture of learning at IkamvaYouth that had an interesting impact on the learners' other school subjects as well.

The two dedicated tutors who gave all their tutoring time to the EWB programme, Nicholas Mei and Braam Daniels say from their experience that while they are essentially tutoring maths they noticed a huge improvement in the confidence and attitude of the learners toward their school work.

2. Lessons Learnt

Achieving consistent learner attendance was challenging. While most of our learners have kept their attendance well above 100% since the beginning of the program, our EWB program lost 8 of its learners who did not meet the minimum IkamvaYouth attendance requirement of 75% through the year.

A meeting was held to understand the cause of the poor attendance. Reasons for this included the distance travelled between home and school during the week. Many of the learners are quite simply exhausted after their regular school program and the associated commute.

Other reasons included different learner registrations (i.e. fulltime or weekend learners) and in one case a pregnancy. Many of the reasons were not a reflection on the EWB program but rather on the challenges of life which many bright-minded South African Township Children have to face from a very young age.

We have noticed that there is a definite link between the improved results and the learners who've attended consistently from the start of the year. These are the learners that have shown the greatest maths and overall improvements. Comparing the improvements made by the learners starting in the 3rd term, it is clear that learners who've derived the most benefit are not only those whose attendance is high but also those who have participated over the longest period since the start of the EWB program.

The environment and culture of IkamvaYouth and the EWB programme creates a holistic approach which rather than just "teaching" learners it enables them to become aware of their inner ability to teach and learn for themselves. So while the focus has been on maths, the

deeper things the learners have learned have manifested in all academic areas. These kids really do have everything they need to succeed.

3. Improvements and Changes for Next Year.

Our learners all come from low-performing township schools where English is not strong, and while every subject should be taught in English, learner understanding is often poor making it challenging for them to answer word-related maths problems. To combat this we are implementing English classes next year to improve the learners' English language comprehension and understanding.

There needs to be a better assessment system not only to provide up to date feedback to the tutors but to the learners as well. We will be retaining the EWB teaching format but utilising other resources to easily and effortlessly conduct and mark tests that track learner performance, allowing tutors to adapt topics or subject focus and intensity. Such tests would only need to be done twice a quarter or term.

The learners also need of better learning venues, stationary, workbooks (i.e. 3 quire A4 books) and a whiteboard. Educational board games & flashcards with a focus on maths and English would be great as a positive learner reward for good classroom cooperation and behaviour. Such games also foster and utilise social learning.

In terms of attendance, for the benefit of the IkamvaYouth learners we will be requiring parents to play a vital role in ensuring their children attend lessons. In addition to this the line needs to be towed with children who do not show the required levels of commitment. The external challenges such as travelling distance plays a large role in dropout rates and bad attendance. Next year we have to be more realistic and accept learners who already attend schools closer to the IkamvaYouth centre.

We will only be taking learners at the beginning of the year and will strengthen the relationship between the learners' parents and IkamvaYouth with home visits. We will also be partnering next year with other organisations that focus on health issues throughout the year to aid in dropout rates associated with teenage pregnancy and illness.

We have also noticed a need for tutor training. One course that provided invaluable understanding for tutors was a Neuro-Linguistic Programming (NLP course). NLP provides an understanding on how we as people think about things; we do so with internal representations. These internal representations may be visual pictures, auditory sounds, feelings, smells and tastes. Some people are more kinaesthetically (feeling) orientated while others may be more visually oriented in their thinking.

So for example, often a child is scolded because he is looking up at the ceiling or out the window during a lesson when the child may actually be building visual mental interpretations of what he is hearing so that he can get a grip of the subject.

Using a simple test, learners were grouped according to the dominant representation systems they used. As a result, the lessons became much more structured and a general format developed which we followed throughout the year. Group work became more organic and natural, marked with a spirit of cooperation. Learners focused quietly on their work and when they did speak it was a discussion of the work amongst the group or with a nearby friend. The sum total of this organic and cohesive group cooperation was the co-operation of all the groups together as a class.

Braam says, *"I found the NLP techniques very useful because it allowed me to communicate with words that match each learner's internal representation about the problem. This enabled me to elicit better information on how the learner understands the problem. From the learners' perspective of the problem I am able to see the small gaps of understanding or incorrect understanding. Addressing these gaps gives me the best leverage when helping the learners with the problems. This is particularly useful when explaining the more foreign concepts of maths like subtracting a big number from a small number… It's not often that we have 3 marbles and someone takes 7."*

We would like to offer this type of training next year to tutors not only as a resource for their own lives but in the classroom as well so that they can utilise the learners' energy positively.

4. Quantitative Impact of the EWB Program

Of the 22 learners who started the EWB program in total, 22 learners successfully graduated from the program at the end of the 2011 academic year. These learners came from a variety of schools as shown below. Most of this year's Grade 8 learners came from two local schools in close proximity to the Ikamva Youth Makhaza Branch, namely Chris Hani High school and Harry Gwala High school.

- Chris Hani 15 learners
- Harry Gwala 4 learners
- Marian R C 1 learner
- Y2K College 1 learner
- Voorburg 1 learner

The graduating class was assembled from two intakes of learners who started at different times during the year. The first group, **i.e. Group 1** started in February and of its 15 original learners, 14 remained to complete the program. The intake for of new learners for the second group**, i.e. Group 2** started in late March and ended early April. Of this groups' 15 original learners, 8 remained to complete the program.

4.1. Comparison of Local School Performance

To determine the impact of the program, the class average of maths results achieved by the learners during the year was compared to the average maths result achieved by the entire grade of the two dominant local schools (i.e. Chris Hani High and Harry Gwala High). The comparison is shown below in Figure 1.

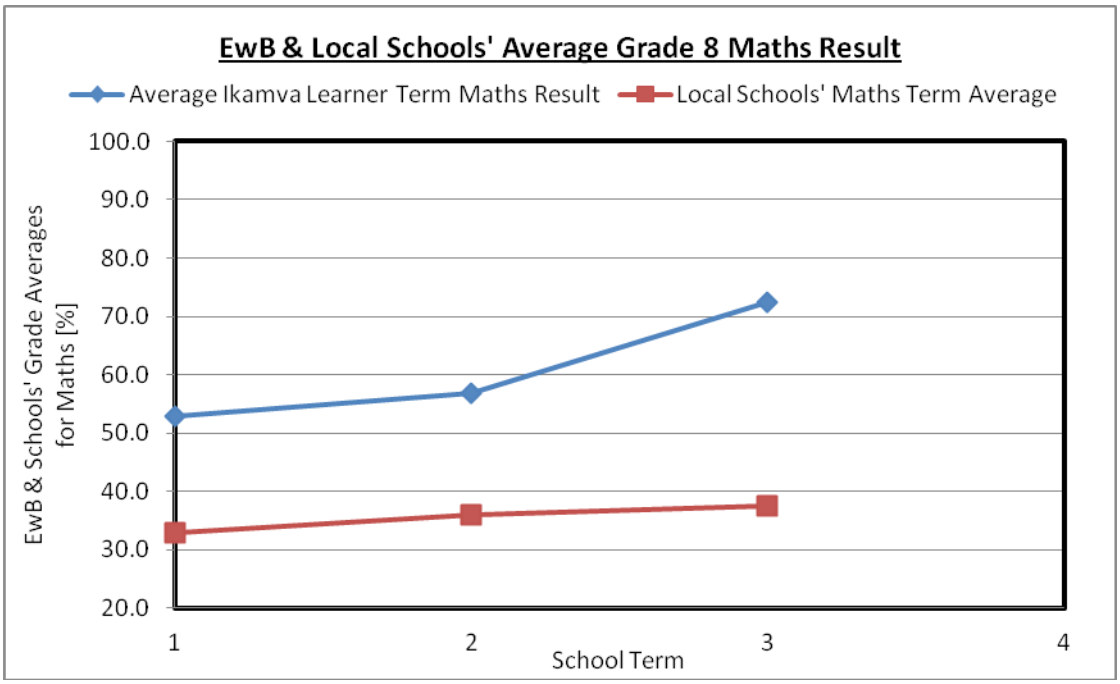

Figure 1: Comparison of the average EWB Grade 8 learner result to the local schools' average grade result.

Figure 1 shows that not only did the EWB program learners consistently outperform their local schools but they also showed a greater overall improvement in their maths mark when comparing the 1st and 3rd term results. The EWB class's school maths average improved by 19.6% while the local school only showed a 4.75% improvement.

4.2. Comparison of Group1 and Group2 Learner Progress

While this comparison is very promising, we wanted wanted to make sure that these results were not high simply due to the fact that only the top performing local school learners were likely to be on the Ikamva/EWB program in the first place.

To do this we compared the average term maths result achieved by Group1 and Group 2 throughout the year. The comparison is shown below in Figure 2.

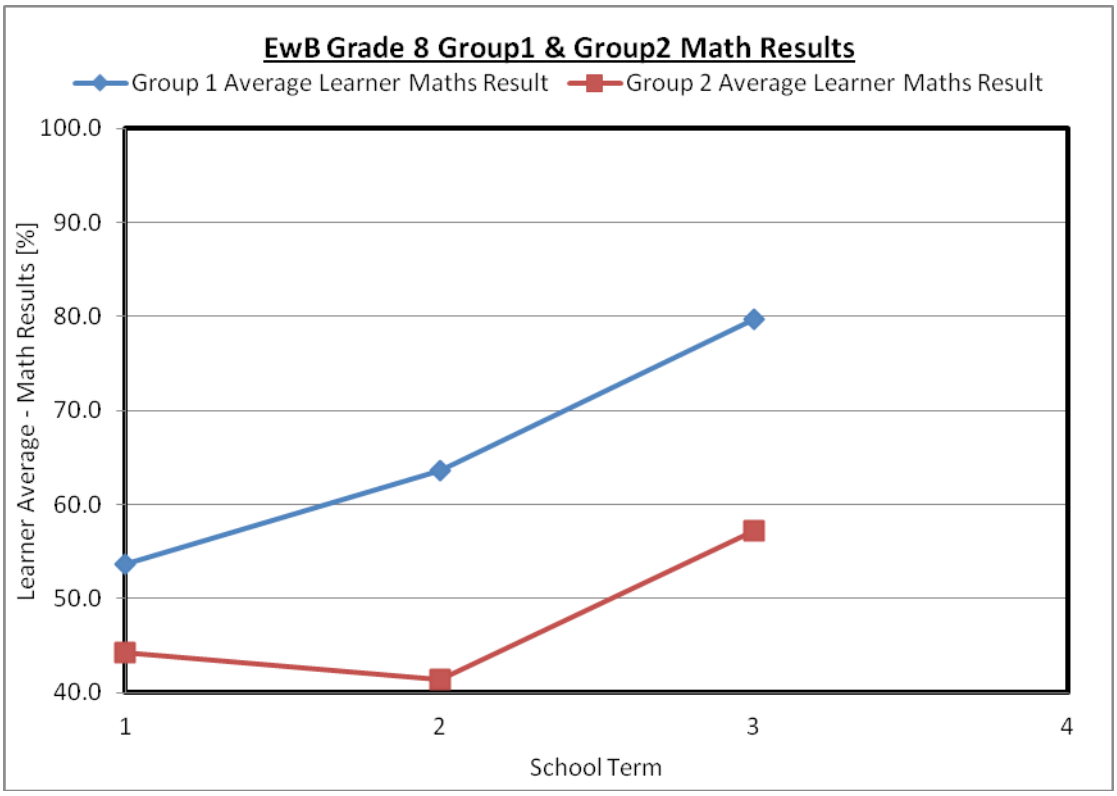

Figure 2: Group1 and Group2 average learner math result comparison.

It is to be noted that the Term 1 Group 2 Average result shown in Figure 2 is shown for information only, as the learners from this group had not joined the program until the 2nd school term.

Figure 2 shows the improvement made by the Group 1 learners between the 1st and 2nd school term. It also shows that during this period the learners in Group 2 actually saw a decrease. The improvement made by both Group 1 and Group 2 learners between the 2nd and 3rd term is dramatic.

This shows that not only were the Group 2 learners able to recover their falling maths marks with the EWB program but they also managed to achieve the same percentage increase shown by their peers in Group 1. This result is indicative of repeatability of this program's impact.

4.3. Overall Class Assessment

We then looked at the EWB class averages of both maths results and overall school grade aggregate achieved by the learners during the year to see if there was any correlation between the two. The results are shown as term averages for all all EWB program participants are shown below in Figure 3.

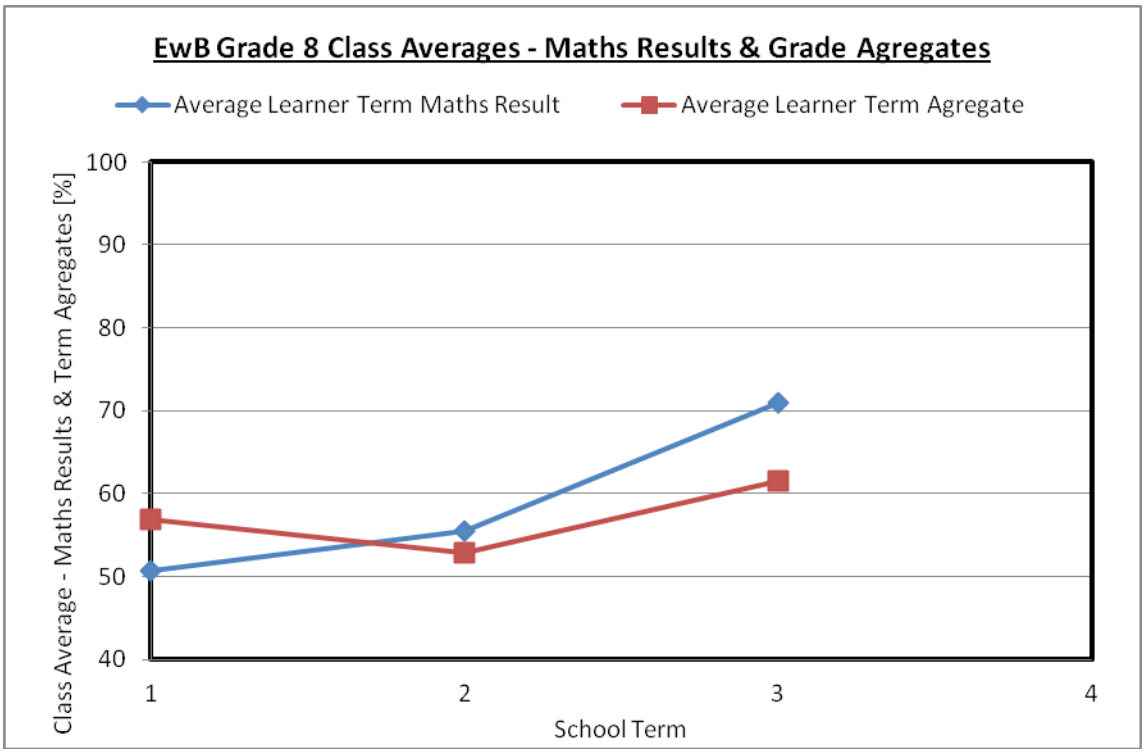

Figure 3: EWB learner term average math result and school grade aggregate.

Figure 3 shows the same improving EWB program learner math result shown in Figure 1, while it shows a consistent and slightly improved learner grade aggregate through the year. Figure 1 however just shows the program class average performance through the year and as a result many of the remarkable singular achievements are overlooked.

The significance of these achievements is highlighted in Table 1 below which is based on the (available) first and third-term school reports of 21 of the 32 learners who were originally registered for tutoring sessions at Ikamva Youth, 30 of whom became the EWB program participants.

Notable Program Achievements	
Number of Maths Improvements	18
Biggest Maths Improvement	44.0%
Number of Aggregate Improvements	9
Biggest Aggregate Improvement	11.7%
Number of Maths and Aggregate Improvements	8

Table 1: Notable EWB Program Leaner achievements, based on 21 available learner school reports.

Table 1 above shows that 85% of the 21 learner term reports which were available for comparison showed and improvement in term maths result. We are also very proud of one learner who improved her term maths mark by an incredible 44%.

Finally we also held two internal assessment tests during the year. The initial assessment test was based on work covered by the EWB curriculum. The final assessment test was based on topics covered by Braam Daniels in addition to the EWB program. The additional topics covered in the test included multiplication, BODMAS and algebra. The comparative results of learners present for both tests are shown below in Figure 4.

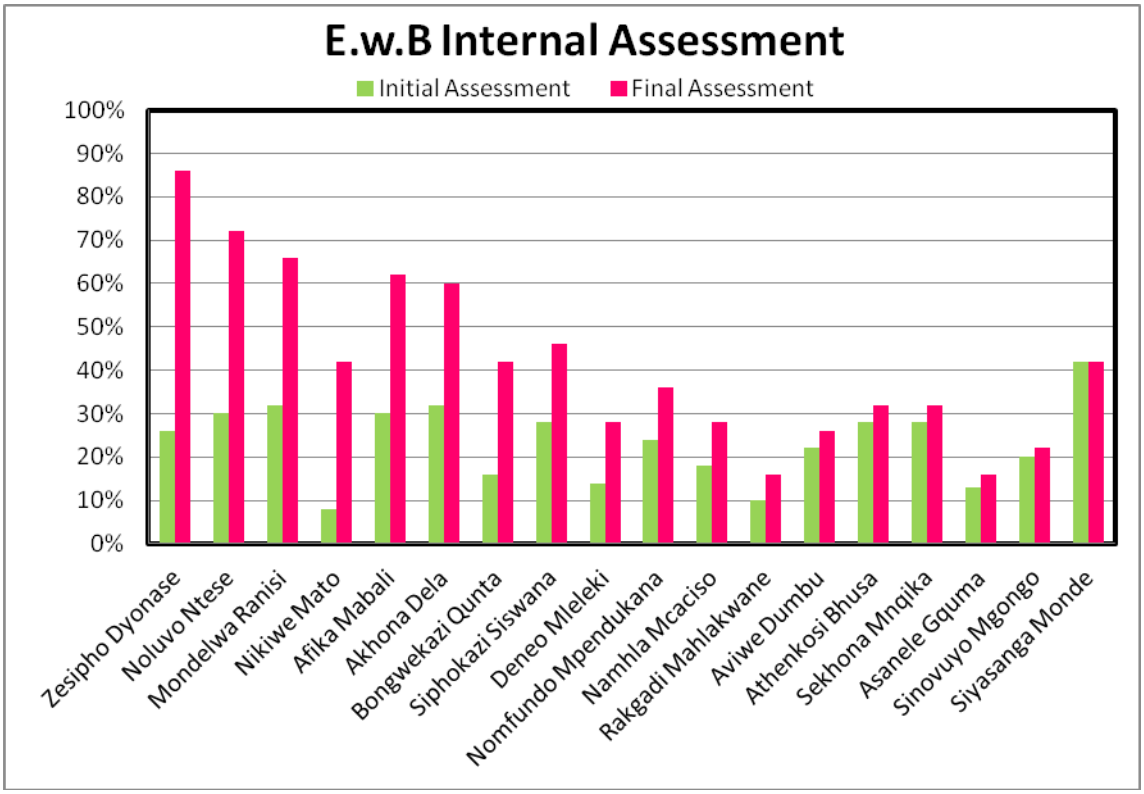

Figure 4: Comparative learner results for the EWB internal assessment tests.

Figure 4 shows clearly the striking increase in maths ability achieved by 18 of the 22 EWB program participants who wrote both assesment tests.

It should be highlighted that the additional work covered in the second test had never been covered in school by these learners. Despite this, the learners demonstrated great courage and curiosity in their learning of these additional maths topics.

This result and that of Figure 2 demonstrates that although many of these learners may have been exposed to years of disadvantaged schooling, they still have the ability not only to recover their maths and grade marks remarkably well, but they also have the mental capacity and flexibility to learn new and more complex concepts in mathematic which they have never seen before.

5. Exceptional students

The learners who have participated throughout the year showed the greatest improvement and delivery of results not just in maths but also in other academic areas. In some cases especially where we saw huge step changes in maths results or term averages, the learners were visibly more confident and focused on achieving an understanding of the subject. The learners that stood out even more were those learners who had not only major leaps in term maths results but those who helped their peers to achieve as well.

There are others who have kept their maths results consistently high throughout the year. These are the learners that are self-driven and have dreams of becoming doctors, scientists, psychologist and engineers. They are wonderful examples of excellence for the class; these learners' results for the first, second and third terms are highlighted below in Table 2.

Outstanding learners in Chris Hani High School				
Afika Mabali	Group 1	58.0	80.0	81.0
Bongwekazi Qunta	Group 1	30.0	59.0	65.0
Siphokazi Siswana	Group 1	50.0	66.0	79.0
Nikiwe Mato	Group 2	65.0	61.0	81.0
Asanele Gquma	Group 2	23.0	17.0	54.0
Aviwe Dumbu	Group 2	41.0	35.0	52.0
Outstanding in Harry Gwala High School				
Akhona Dela	Group 1	38.0	48.0	76.0
Mondelwa Ranisi	Group 1	65.0	97.0	89.0
Nomfundo Mpendukana	Group 1	56.0	64.0	80.0

Table 2: Outstanding learner performances from the two local schools.

Furthermore, 10 learners received IkamvaYouth Best Attendance awards for maintaining a consistent attendance of 95% to 100%.

6. Tutor Experience

Externally to the programme running throughout the year, we as IkamvaYouth Makhaza have had a few challenges of our own to deal with, including a petrol bomb destroying our office on 27 April 2011. While everything was destroyed, the Yes We Can Maths books survived with only a little smoke and water damage.

Braam Daniels says, "*The book approaches the basic maths fundamentals very well. This I think is the biggest hurdle for many of the kids. They are smart enough to understand pre-algebra but they are slowed down by not knowing how to easily and effortlessly multiply, factorize and take percentages."*

The book has done a good job of teaching the kids these fundamental steps. I also think that the quantity, content and level of the challenges provided by the book form a very good teaching or tutoring frame work for IkamvaYouth tutors to use while enabling the learners not only in maths but in other subjects and indeed life as well.

In this programme, patience is key. When learners do not understand concepts, they need to be reassured that not understanding something is a perfectly normal part of the process of learning and it does not mean that they will not understand it in the future.

We need to be flexible in our explanations. Explaining the same thing over and over when a learner is not getting "it" is not going to teach the learner anything. In fact it is more likely going to install a mental block. Rather, ask the learner what they understand about the subject first. Then as the tutor you can see where the leverage points are and how you can

adjust the learner's model of the subject to fit the correct understanding. This is far better than a tutor explaining their own model to the learner over and over in words which might not even make sense to the leaner."

7. The EWB Culture of Learning

The EWB programme has played a huge role in helping learners improve academically, not only in mathematics, but it has also trained the learners to be able to approach any kind of question without them struggling. It has helped them gain confidence in approaching maths questions and most of all it has taught them on how to work as a group.

The environment created is one of consequence-free learning and the culture is one that promotes and encourages the effort rather than the result (i.e. right or wrong).

We see the learners at most three times week; realistically we could not hope to teach all these learners everything they cover in school. So it was in this environment and culture that we hope to instil these things so that learners build their confidence in their ability to learn, enabling them study towards whatever dreams they have all on their own.

So while sharpening basic math foundation skills with the EWB content and challenging the learners as cooperative groups with basic algebra problems, in a consequence-free learning environment, we strive to remind these young minds that…

"*Not knowing is the first step to knowing. There is no need to panic when you can't immediately think of how to solve a problem. This is normal and we are here today because we are going to find out how it's done.*"

"*Trying to solve a problem and getting it wrong is totally OK because you have then figured out exactly how not to do it. So to get it right do something else.*"

"*You have everything you need to succeed."*

8. Financial Report

Please refer to the table below, which outlines the expenditure of the second tranche:

Tutor Payments	R 10,000.00
Food	R 6,619.82
Prizes	R 520.00
Overheads	R 4,223.68
Total	R 21,363.50

9. Conclusion

IkamvaYouth is very appreciative to EWB for enabling us to implement the Maths Yes We Can project for our Grade 8s at the Makhaza Branch. We would very much like to continue running this successful program at the Makhaza branch for our 2012 grade 8s, and to include an English language component. Other IkamvaYouth Branches are also interested in implementing the project, and so we hope that EWB will consider supporting IkamvaYouth further in 2012.