

## SOUTH AFRICAN MATHS EDUCATION

In 2018, less than half of matriculants chose pure Maths and only 37% of those achieved 40% and above. This means that the majority of South Africa's students have significant gaps in understanding and/or chose Mathematical Literacy which does not necessarily prepare them for higher-level careers. While Dr Nic Spaull's research shows that these gaps in understanding are divided along socioeconomic lines, we have seen that even learners in the best of schools can have learning gaps that have developed over previous years of schooling.

## HOW WE FIX THE PROBLEM

### 1. Identify the individual learning gaps

Reflective Learning diagnostics measure the mastery of critical foundational concepts across seven areas of Maths, benchmarked at three levels. Our High School diagnostic measures 81 concepts at Grade 3, 6 and 9. We also measure six Learning Behaviours that influence student achievement: Pace, Precision, Perseverance, Mindset, Motivation, and Metacognition. Reporting includes individualised and cohort analytics that help learners and teachers understand the learning gaps across every concept and area. Through this, we know exactly where the learning gaps lie and how far back the problems go.

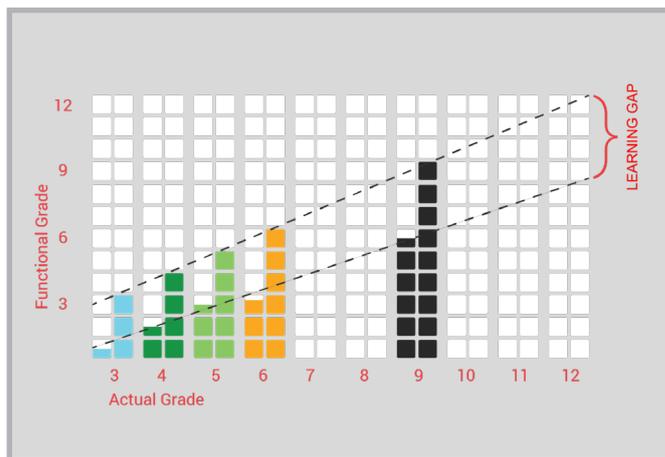
### 2. Target the gaps with personalised catch-up content

Since every learner's gaps are unique, their remediation should meet their specific needs. Our customised, self-study catch-up content builds conceptual understanding from whatever level the learner is at up to Grade 9 level for each concept. In addition, each module guides learners through a process of understanding their own strengths and weaknesses and applying self-reflective activities which improves their metacognition and ownership of their learning. This is currently available in print form (to be digitised in the near future) and has been used in afterschool sessions and at home - we simply recommend an accountable adult to encourage the learner.

### 3. Monitor individual and cohort progress

By running the diagnostic again, parents, teachers and (mostly importantly) learners will be able to see how much progress has been made and in which areas. This tangible feedback reinforces growth mindset in Maths and gives guidance on when to move onto the next set of modules. Using this approach, we have seen some incredibly promising results with learners as far along as Grade 10 catching up their many of their learning gaps within a period of a year. We've seen that it is never too late for a learner to do well in Maths if they have the opportunity and are willing to put in effort.

Despite knowing this, teachers are often unable to help learners for a range of good reasons: (1) lack of time from curriculum pacing to identify and remediate gaps, (2) the large variation of different gaps within a single class, (3) lack of training in early school pedagogy where the gaps often lie, and (4) lack of resources aimed at catching-up gaps across grade levels. We aim to support schools by providing easy-to-use tools to enable learners to catch-up missed concepts so that they can engage with grade-level content more effectively.



**WELCOME!**

This is the start of your Reflective Learning journey! We believe that this is the start of a special and exciting process for you! To show you why, let us tell you a true story...

### it is possible...

In 2012, 50 Grade 10 learners in Mpumalanga started a three year Saturday morning programme called Uplands Outreach Learners 4 Excellence (U4E). The idea was to give them extra lessons in Maths and other subjects to help them be fully ready for university. But most of these learners were really struggling. Even though they were in a Grade 10 class, they were actually functioning at a level between Grade 3 and Grade 6 in Maths. On their first assessment, they had a class average of only 24%.

Does that mean that they were bad at Maths? No! It means that they hadn't had the opportunity to learn many Maths concepts... yet. Instead of giving up or believing that they couldn't do Maths, they worked really hard. Besides those extra lessons, they did daily homework and constantly reviewed their progress along the way. And guess what? They caught up between 3 and 6 Grades in one year! They now had a class average of 70%.

Two years later, 44 of the 50 learners achieved high enough marks to go to university! And one even achieved 94% for Maths and came in the top ten in the province! They went onto study Medicine, Nursing, Paramedics, Chemical Engineering, IT, Law, Human Resources, Agriculture, and Teaching.

What this has taught us is that it is possible for you to excel in Maths and go to university no matter where you start. But it takes real dedication and daily effort to make it happen.

So, let me ask you...

What is your dream? Where do you want to be in five years time? Do you believe you can achieve it? And how hard are you willing to work to get there?

We all have challenges to overcome to reach our dreams, but it's only those that are willing to push through the difficult times that will succeed.

It's our job at Reflective Learning to give you the tools to excel at school and it's your role to trust and follow the process. But before we start learning, we need to look at some of our core beliefs around learning because they shape our thinking.

reflective learning

## WHY PARTNER WITH REFLECTIVE LEARNING

With foundational learning gaps in Maths growing as learners move through grades, there is a need for schools to ensure missed learnings are caught up effectively so that they are adequately prepared for FET phase. Reflective Learning has been developed with this in mind:

1. It is scalable across online and offline contexts.
2. It tracks conceptual knowledge for individuals and cohorts.
3. It enables teachers to meet personal needs without a large investment of time and energy.
4. It helps learners to engage better with grade-level content.
5. The approach has shown to have significant impact.

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## SCHOOL CASE STUDY

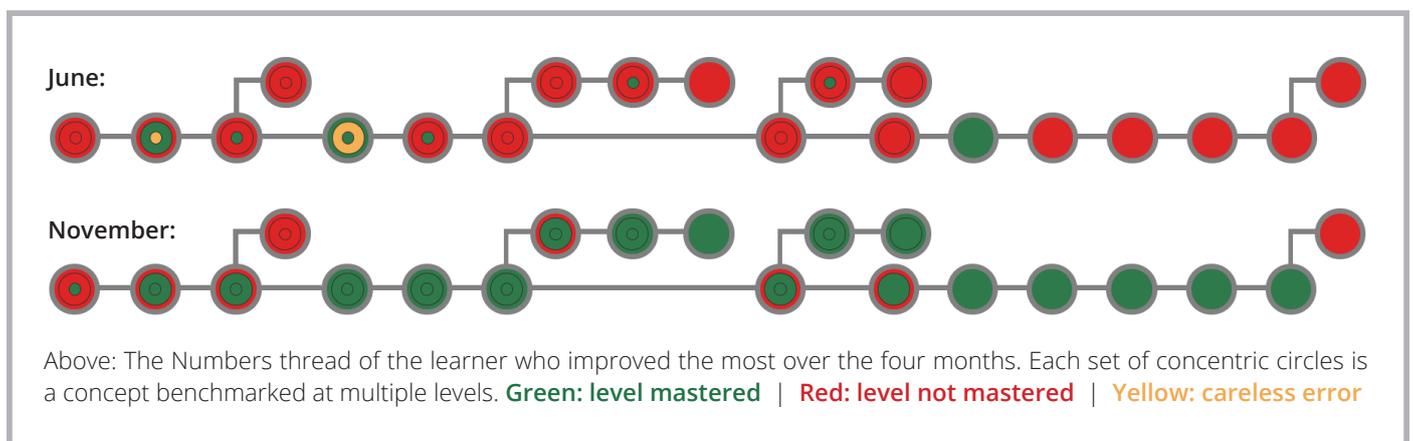
With only eight learners in Grades 10 to 12 studying pure Maths as a subject in 2018, a high school in the Northern Cape wanted to increase the number of learners choosing Maths and the general achievement of learners. External funding enabled Reflective Learning diagnostics to be run as a baseline with Grade 8 and 9 learners. Their overall results showed that the majority of learners (71%) functioned between Grade 3 and 6 level, with 5% being below Grade 3 level. There also appeared to be difference in the base levels of learners across the two Grade 8 classes. The average attainment for the Numbers thread was 48%.

Reflective Learning provided printed catch-up content while the teacher for the Grade 8 and 9 classes created opportunity for the learners to work through the modules in a self-study format during the week in after school sessions, and assisting them where they had specific questions. The regular CAPS curriculum was followed in class time, while an additional tutor was employed to assist learners with grade-level content on a monthly basis.

After working through only 16 of the 22 modules over the course of four months, learners across the two grades caught up between 1 and 1.5 grades. One particular class (see right) progressed by 2 grades on average with learners improving by 25% in the Numbers thread of the diagnostic. The majority of learners now functioned between Grade 6 and 9 level (up from 23% to 54%) with no learners below Grade 3 level anymore.



Were learners to continue to improve at this trajectory, these results point to the realistic opportunity that learners could catch up the majority of their learning deficits in an extra-curricular programme within a two year period. Theoretically, were an intervention run with Grade 8s at the start of High School, they could have closed their gap sufficiently by the time they need to make subject choices for Grade 10.



## SOME OF OUR PARTNERS



**We believe that every learner has the ability to excel in their learning if given the opportunity.  
We strive to make that possible through scalable and easy-to-use resources that have a large impact.  
We invite you to be part of the story!**