



Abstracting Diamonds from Dirt

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National Science and Technology Forum

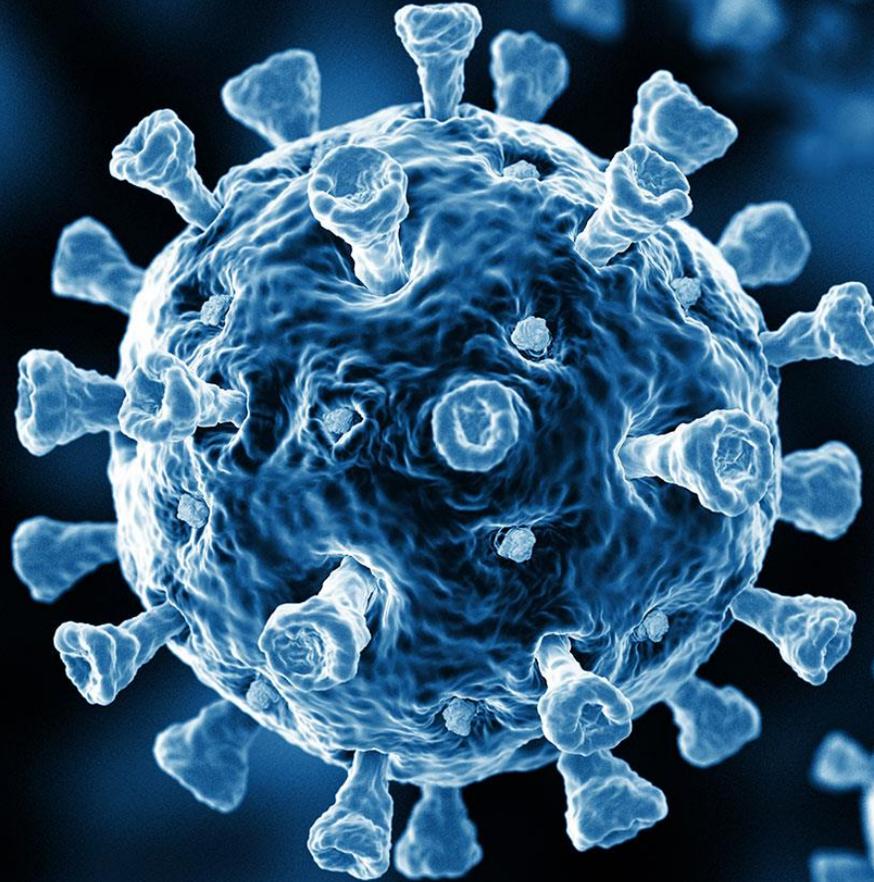
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Introduction

I would like to take this opportunity to thank the leadership of NSTF and its partners for making platforms like this available. Engagements such as these are significant. It is a privilege for me as an educator to engage with professionals such as you, and I am certain that each one of you knows the importance of a teacher. However today I will not be teaching, but rather invite you back into the classroom for a moment.



Role of a teacher in advancing Math and Science



Duty Calls

- We have been tasked with an amazing task which is to produce future leaders and world changers.
- Teachers are the catalyst of change, progress, and future communities.
- Our role in society is significant, but the question is: do we recognize the importance of what we do as teachers?
- It is up to us colleagues to recognize our worth and begin to appreciate what we do.





All hands-on deck

Teaching Math and Science ,The Problem



Declining Numbers

Learners are not motivated to study maths and science due to high percentages of learners failing these subjects.



Numeric Problems

Over the past five years, significantly less than 50% of the matric final exam writers wrote mathematics as a subject.



Pass Rate

In 2018, out of a total of 270,516 mathematics writers, 37% passed with 40% and above.



Cost

Maths had the lowest outputs of the subjects classified as gateway subjects. These are subjects considered critical to the economy and development

A large number of dark grey puzzle pieces are scattered across a dark background. The pieces are in various orientations and some are overlapping. The text "Finding solutions" is overlaid in white, bold, sans-serif font on the right side of the image.

Finding solutions

Building from ground up!

Currently, I am raising funds to build the biggest virtual classroom and buy a mobile laboratory because the idea is that learners need to see the formulas from the textbook coming to life at a lab. The reason why we are doing badly as a nation in both math and science is that we do not have the infrastructure to prove the theories taught in class.

Professionals such as yourselves play a critical role in helping us on the ground. Forming partnerships that will advance science and technology from the ground up.



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Teaching Math and Science, the solution

Create an environment

- Creates an environment which allows learners to feel free and feel at home. This will allow learners to interact during the lesson. Most learners are bound by fear to ask questions or seek clarity on the topic, therefore a relaxed environment accommodates them.
- The teacher needs to be approachable.
- When we teach, we must focus more on skills per question instead of answering the past question papers only.
- I created summary notes which focus on skills required to answer questions. And we also look at how the question is asked in the exam instead of focusing on the textbook.

Motivate

- Most learners in math and science give up too easily, by the time they write an exam they have already told themselves that they have failed. Therefore, what I do in this case is to show them how easy it is to pass Math and Science.
- We start the conversation by discussing the levels not passing and failing. Therefore, we look at the entire term and narrow our focus on the 75% which is on the exam. From there we set our targets. This motivates them to study with a purpose and a target in mind. This also dismantles the fears that these subjects are difficult.

Get Learners involved

- We also increase participation in class, learners do presentations, and we correct where there are misconceptions. Learners get practice under our supervision; we look at their skill in answering questions. Once they get it right, they never forget it.

Teaching Math and Science, the solution

Integrate social trends

- Another way of teaching math and science which has helped me produce high numbers of learners who excel in these subjects is the integration of social trends, sport and other creativity.
- Maths and Science is all around and in us. We are the result of science therefore no need to look any further for answers.
- I usually turn a formula into a song or use sport signs such as cross bones of Orlando Pirates, 7 Sundowns or Peace sign of Kaizer Chiefs to illustrate angles. If there is a trending dance move, I use those dance moves to teach maths and science.

Separate and schedule

- At the beginning of the year I separate them according to their capabilities.
- Learners who need more time to grasp are scheduled for the morning classes while the high flyers are scheduled for the afternoon.
- Such separation helps in avoiding learner frustration in class.

Bring Science to life

- In the absence of a lab which helps create a realistic perspective science must be taught more practically. Have labs if not labs have demonstrations in class. Let learners visualize, apply, and solve. Furthermore, take real world problems of science into class (be relevant) allow the learners to have an opportunity to come with innovative ideas and solutions on that.

Conclusion

Let us be intentional

As a science and technology community, we need to be intentional about populating our space with brilliant young minds, this means that we must make tools available for the abstraction of these diamonds because they are hidden in the rocks and hard places, in the dusty streets of our townships and rural areas.

Let us be practical

The theory is beautiful because it is rich information, however, bringing that information to life is a whole new challenge on its own. You can tell someone about the ingredients of a great dish, but the real deal is what happens in the kitchen. Math and Science are no different, our kids need to see these theories coming to life.

Hype our global impact

South Africa has produced some of the most amazing brains in science and technology, people such as Siyabulela Lethuxolo Xuza, Prof. Abdool Karim, Prof. Alta Schutte, Prof Glenda Gray, Dr. Chris Barnard, and many others have shown that South Africa's contribution to the world is valuable. Our kids need to know this, they need to find and interact with such role models more often.





Thank you

I hope that we can strengthen the net, roll our sleeves and start digging those diamonds stuck in the dirt.

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