# INTRODUCTION



**The Cape Town Science Centre, in collaboration with the Western Cape Education Department, has earmarked STEM Clubs as a strategic extra-curricular support programme to promote STEM engagement, literacy and career development in the Western Cape.**

## THE ROLE OF STEM CLUBS

It is generally acknowledged that there is a need to improve learner's STEM skills and knowledge in order for them to navigate their way through the world they live in and to successfully access the opportunities available to them (Afterschool Alliance, 2011).

The general downward trend of elective participation in STEM subjects by learners is a growing concern. While numerous STEM support programmes target what happens in the classroom, much of what shapes a learner's attitude, confidence and interest in STEM subjects and fields is cultivated by their experiences outside of the classroom.

STEM Clubs, which develop aptitude and interest in STEM subjects and fields from an early age, and furthermore sustain their interest through the learner's school career, increase the learner's achievement and performance in STEM subjects. Chittum et al. found that with engagement in after school STEM Clubs, learners could be motivated in STEM subjects and that the experience had a positive impact on their perceptions about science as a field. Chittum et al., International Journal of STEM Education (2017) 4:11.

## STEM CLUBS *defined...*

**STEM Clubs offer learners opportunities to explore science, technology, engineering and mathematics (STEM) topics in an informal setting, allowing them to experiment, to ask questions and experience challenges that interest them. STEM Club meetings are usually teacher-led but are driven by learners.**

**STEM CLUBS ARE TEACHER LED, LEARNER DRIVEN**

> **Our Team is doing very well; learners from Grades 4 to 7 are so impressed with the STEM CLUB activities especially the practical part. They are excited, even now they continue asking about more activities. They are learning more at STEM CLUB meetings. Even us as Educators, we are learning as we do these practicals especially when guiding them during the Monthly Challenges.**
>
> **Lukhanyo Team STEM Club**

# INTRODUCTION CONTINUED



## BENEFITS OF STEM CLUBS

**School-based STEM Clubs provide opportunities for Learners to explore STEM topics, providing exposure beyond the scope of the curriculum and encouraging a culture of lifelong learning. STEM clubs promote heuristic thinking, cultivate positive attitudes to STEM, help link abstract concepts learnt in class to the real-world and allow Learners to be the authors of their own discoveries and learning, ultimately building their confidence and encouraging participation in competitions like Expos and Olympiads (and more).**

Learners from both Primary and High schools benefit greatly from participation in STEM Clubs, improving the culture of STEM learning amongst participants which leads to other Learners wanting to take up STEM subjects and in turn showcase their achievements in class.

**From research by the Afterschool Alliance at Harvard University in 2011, the benefits of STEM club can be grouped into 3 categories:**

1. **Improved attitudes towards STEM fields and careers.**
2. **Improved STEM knowledge and skills.**
3. **A greater likelihood of graduation and pursuing a STEM career.**

**Studies into the post-school benefits of STEM Clubs indicated that a high proportion of participants pursue post-graduate studies in STEM fields and follow STEM careers. Participants reported that working in STEM Clubs opened a new world to them, helping them engage more with science literature and discover the many opportunities that studies in science held for them. It furthermore fostered a sense of responsibility in the participants.**

Afterschool Alliance

The STEM Club Project intent is to support the WCED participating schools to promote participation and performance in Maths and Science. The aim is to promote the career opportunities and to make Maths and Science fun, thus demystifying perceptions that Maths and Science subjects are difficult to study.

Forty four schools from all over the Western Cape were selected to launch this Project at their schools. Teachers were trained and started the STEM Clubs back at school from April - July 2022.

Learners who were part of the STEM Clubs engaged with STEM activities outside the classroom during STEM Club meetings. They selected activities from the kits provided that developed skills and competencies to enhance Maths and Science understanding. Learners developed a range of STEM competencies including management skills whilst having fun. Opportunities are also provided for learners to take part in various competitions; namely the CTSC Monthly Challenge Competition, the NRF SAASTA Natural Science or Life Sciences or Physical Sciences Olympiads and the Eskom Expo for Young Scientists Regional Competitions.

Teachers were requested to set up the Clubs, lead and support learners that drive the activities of the Clubs. Teachers also had the opportunity to get to know their learners and interact with them in an informal space. They also got the chance to run an extra-mural activity at their school.

Results show that 1573 learners and 113 teachers from 60 schools were involved in the STEM Clubs in 2022. These learners and their teachers received STEM Club Certificates at the end of the year.

We thank the teachers for managing the STEM Club programme at their school and we plan to expand the project to other schools and to progressively increase the participation and performance in STEM subjects. This will enable learners to benefit from the post school opportunities in the Science, Technology, Engineering and Maths learning fields.

**DON HARIPERSAD**

**WCED Director: Curriculum FET**