



SUNCEP

ANNUAL REPORT

2017



SUNCEP
CENTRE FOR PEDAGOGY
STELLENBOSCH UNIVERSITY



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FOREWORD



Dr Trevor van Louw

SUNCEP is five years old!

It feels like yesterday when we first presented ourselves as the SUNCEP team in 2013. Yet if we look back at the activities and achievements of the last five years, we can hardly believe what we have been able to do in the short lifetime of the CENTRE!

These achievements and the qualifications obtained naturally speak volumes about the highly dedicated and innovative team. What SUNCEP has achieved would obviously not have been possible without this SUNCEP team! Congratulations once again on the improvement in qualifications and the strengthening of skills, but a special thank you for each SUNCEP team member's contribution to the creation of an environment in which everyone can flourish.

As in the preceding years, the TPL team has once again shown what can be achieved through teamwork. The contribution made in 2017 towards the strengthening of the capacity of district officials, school management teams and Maths and Science teachers in the Western Cape, Northern Cape and Eastern Cape, but especially the requests that these processed be continued in 2018, speaks volumes about the sustained enthusiasm, innovation and network development and consolidation. The challenges mentioned hardly dampened the growing excitement that characterised the build-up to the presentation of SUNCEP's first full qualification, the Advanced Diploma in Education (ADE), in 2018 ... and that while we were working unceasingly on SUNCEP's e-learning initiative!

The fantastic work done by the SBI since 2013 was continued in 2017 with increased enthusiasm. How else could we have succeeded in expanding SU's presence to learners who could hardly envision a world after their schooling because of the enormous challenges they face. The work done on farms in the Boland and the deep rural areas of the Northern and Western Cape would hardly have been possible without the enthusiasm of the SUNCEP team. The enhancement of this work through the adoption of ICT naturally speaks volumes of SUNCEP's innovative thinking!

SciMathUS did exceptional work in 2017, as in all the years since its establishment, to create opportunities for young people who would otherwise never have been able to pursue a university education. The fact that almost the entire 2017 cohort gained access to university programmes after a year with SciMathUS, speaks volumes of the dedication and enthusiasm of the SciMathUS team and their faith in the potential of young people who may otherwise have been deprived of such opportunities because of their circumstances. There is no better reward for all the hard work than to see former SciMathUS students receiving their degrees with pride!

2017 also saw the launch of the DST: Talent Development Project, which was a realisation of the SUNCEP ideal of having a presence in each of the nine provinces. Without the dedication of the SUNCEP team, the sheer scope of the project (both geographically and in terms of the number of role players) would probably have scared us off. The fantastic work done during 2017 (as well as the fine achievements of the TDP learners) reminded everyone at SUNCEP anew that even the most daunting challenges can be met with sustained hard work!

The achievements of the past year were naturally possible only through the support of those who 'hold the fort' here. The sterling work done by our Admin and financial management team deserves special mention. As a team we await with great anticipation the establishment of the proposed component: Corporate Services in 2018 and with that the phasing in of an information management system that should hopefully make our environment a 'paperless' one in the near future.

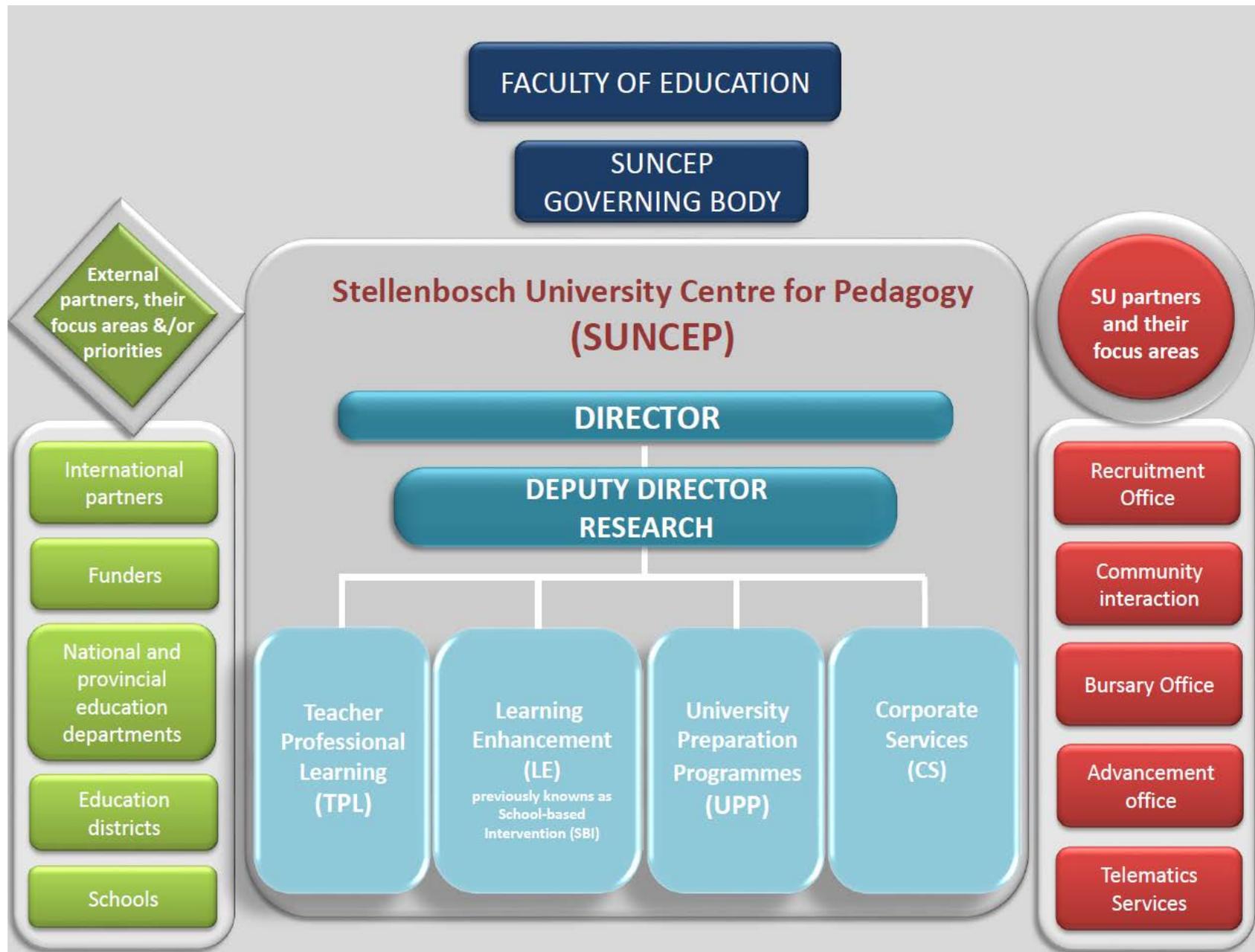
SUNCEP owes a great debt of gratitude to our research component for the conveyance of insights developed via our activities to larger provincial and national knowledge partners. The striving to be a leader in the thinking of our sphere of influence, and the preparation to expand the process massively in 2018, are fully on course under the expert leadership of the head of the component: Research. The sustained support of SUNCEP in the preparation of conference presentations and academic articles, as well as the completion of postgraduate studies, lays a strong foundation for future research outputs.

To the wider SUNCEP family – funders, parents, teachers, learners – a warm word of thanks for your continuous support!

We look forward in humility and with deep gratitude to the excitement that awaits us in 2018!

Go well,
Trevor

SUNCEP ORGANOGRAM



MEET THE SUNCEP TEAM



Prof Mdu Ndlovu



Ramesh Jeram



Nokwanda
Siyengo



Andrew Fair



Celeste Links



Dr Sharon Malan



Clifton Ayford



Dr Cerenus
Pfeiffer



Elsje Beyers



Dr Elza Lourens



Dr Janina
Theron



Munya Masiwa



Noni Kulati



Christa
Philander



Danelda van Graan



Erika Hoffman



Pauline
Hanekom



Lynthon Jacobs



Anneke Muller



Benurita Philips



Adele Pool



Shaun Graham



Paul van
Vollenhoven



Eva Keyser



Merle Festus



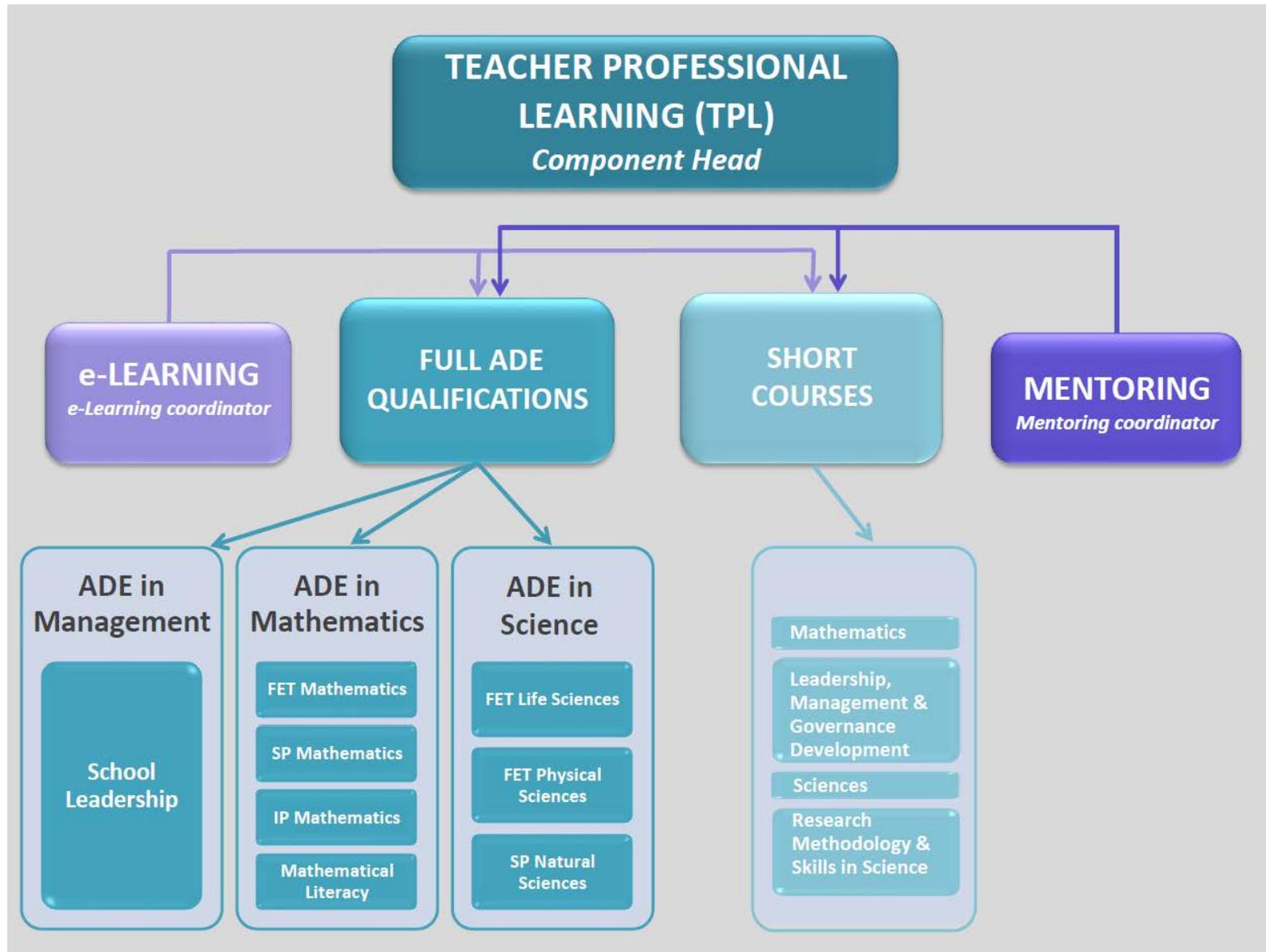
Eileen Thomas



Leon Thomas

TEACHER PROFESSIONAL LEARNING

Professional learning programmes aimed at enhancing the capacity of educators and principals



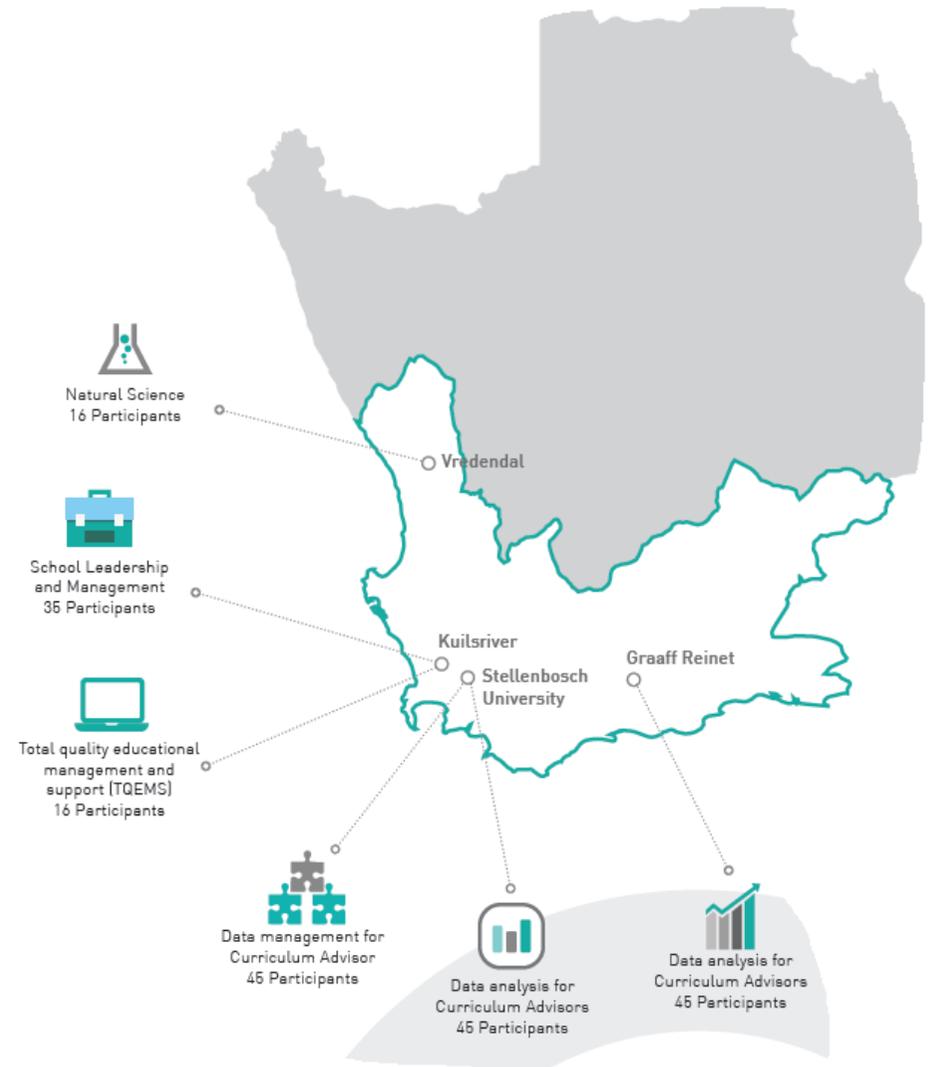
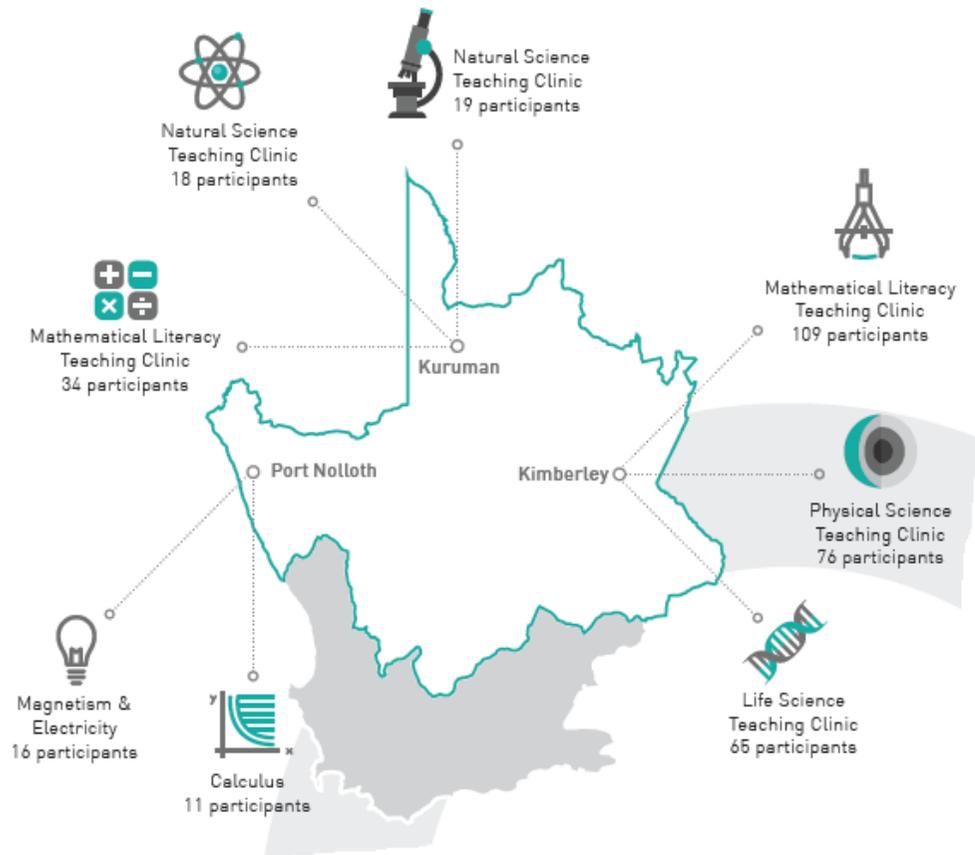
TEACHER PROFESSIONAL LEARNING

In this component, SUNCEP offers practice-based professional learning programmes, both as full qualification courses and accredited short courses to currently serving teachers. In 2016, 590 currently serving teachers, across the Western and Northern Cape, participated in accredited practice-based professional learning short courses. These include courses ranging from Mathematics and Science teaching, to School Leadership and Management short courses.

SUNCEP is currently delivering, at the Cape Teaching and Leadership Institute, three Advanced Diploma in Education (ADE): Mathematics teaching qualification programmes in Intermediate Phase, Senior Phase and Further Education and Training Phase. SUNCEP is also preparing to submit, in 2018, documentation for its Advance Diploma: School Leadership and Management, to the Higher Education Qualifications Council (HEQC), via Stellenbosch University, for accreditation.



TEACHER PROFESSIONAL LEARNING



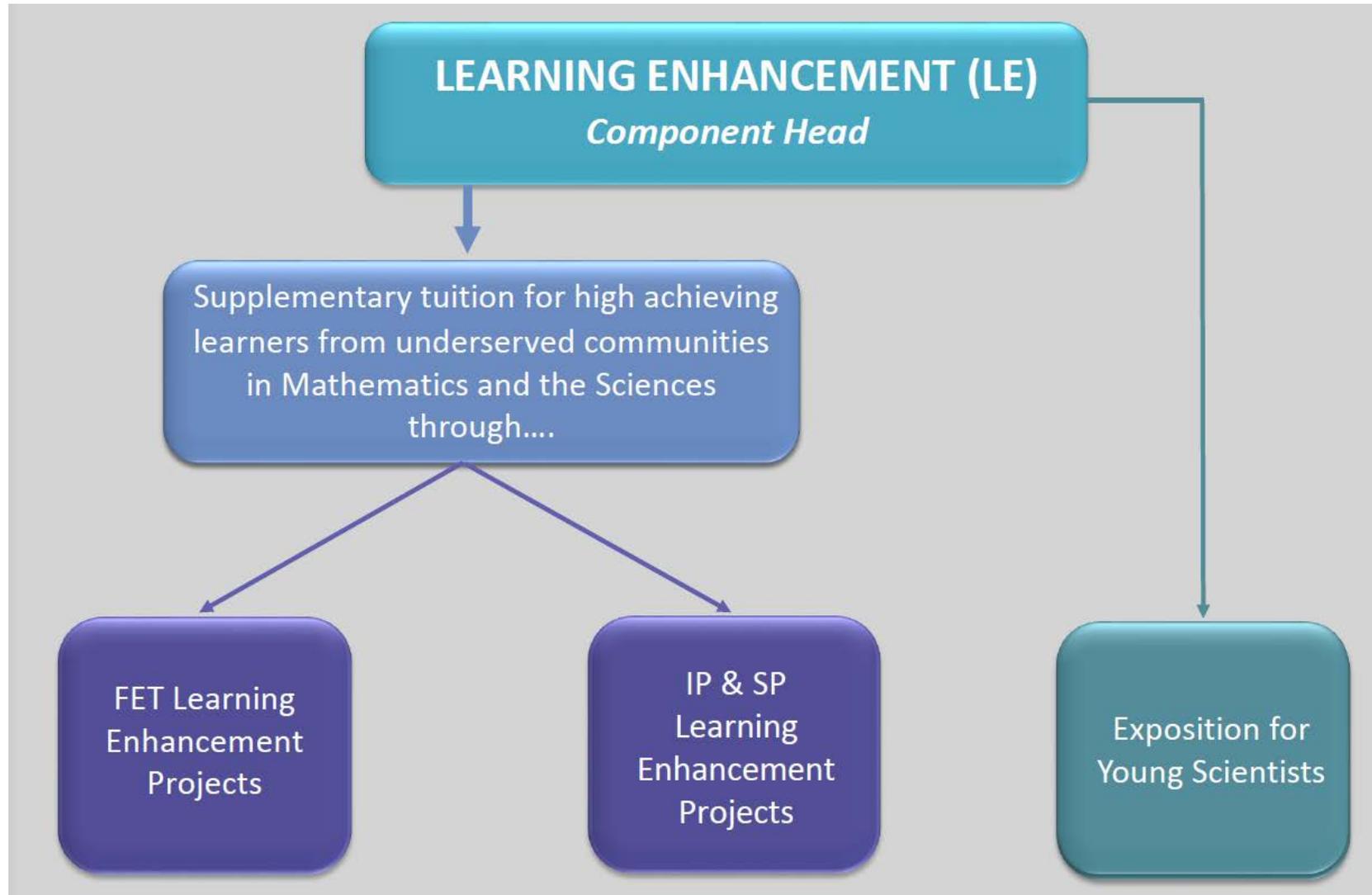




LEARNING ENHANCEMENT

(Previously School-based Interventions)

Learning Enhancement support offered to high achieving learners in underserved communities



LEARNING ENHANCEMENT

Learning Enhancement is a component of SUNCEP, which gives mainly top performing learners at schools the opportunity to participate in additional tuition programmes in Mathematics and Science. The areas covered in 2017 with tuition at FET level was Atlantis, Stellenbosch, Worcester, Franschhoek, Olifantsriver in the Western Cape, and Springbok in the Northern Cape.

Tuition in Mathematics and Afrikaans is provided to primary school learners in grades 5, 6 & 7 from the Breede Valley area near Worcester in the LitNum Hub project. An exciting aspect of the LitNum Hub project is that currently a state-of-the-art technologically equipped school is being built in this area. Other features of this school is that it will also be a green school focusing on generating its own electricity and making energy and water saving a top priority.

In 2017 a test run was done with a virtual class in Mathematics and Afrikaans. The idea is that virtual classes will be broadcasted once a week from SUNCEP to all the participating schools and in so doing, extend the holiday school into the school term and broaden the base of learners reached to the entire Gr 5 class. SUNCEP tutors will be presenting the lessons. Later these virtual classes will also be available to grades 6 and 7 learners.



LEARNING ENHANCEMENT

Project	Geographical Area	Grades	Participating schools
Western Cape			
Project: LitNum Hub	Botha's Halte	5,6,7	Botha's Halte Primary School, Bet-El Primary School, La Plaisante Primary School, Petra Gedenk Primary School, Slanghoek Primary School, Wysersdrift Primary School
Olifantsrivier	Olifantsrivier	7 to 12	Vredendal Secondary High School, Doringbaai Primary School, Ebenhaeser, Koekenaap Primary School, Maskam Primary School, Nieuwoudt Primary School, Vergenoeg Primary School, Vredendal North Primary School
Project: Hope @ Atlantis	Atlantis	10, 11, 12	Atlantis Secondary High School, Proteus Secondary High School, Robinvale High School, Saxonseas Secondary High School
Project: Stellenbosch Hub	Stellenbosch	10, 11, 12	Cloetesville Secondary High School, Luckhoff Secondary High School, Makupula Secondary High School, Kayamandi Secondary High School, Kylemore Secondary High School, Stellenzicht Secondary High School
Project: Worcester	Worcester	11, 12	Worcester Secondary High School, Esselenpark Secondary High School, Breërivier High School
Project: Franschhoek	Franschhoek	8, 9, 10	Franschhoek High School, Groendal High School
Northern Cape			
Project: NamaSci	Namakwa District (Springbok central point)	10, 11, 12	Nababeep High School, Boesmanland High School, Port Nolloth High School, Alexanderbaai High School, Steinkopf High School, Aggeney's High School, Namakwaland High School, SA van Wyk High School, Concordia High School, St. Anna Privaat, Kharkams High School, Garies High School

LEARNING ENHANCEMENT

Project	Number of participants
LitNum Hub	
Gr 5	25
Gr 6	29
Gr 7	18
Hope @ Atlantis	
Gr 10	25
Gr 11	21
Gr 12 (43% gained access to SU)	21
Stellenbosch Hub	
Gr 10	29
Gr 11	19
Gr 12 (65% gained access to SU)	17
Worcester	
Gr 11	12
Gr 12	14
Olifantsrivier	
Grs 7 – 12	500
Franschhoek	
Gr 8	43
Gr 9	40
Gr 10	40
NaMaSci	
Gr 10	21
Gr 11	18
Gr 12	28
Total no. of participants	920



LEARNING ENHANCEMENT

Eskom Expo for Young Scientists

Expo in Stellenbosch is one of 35 regions in the country, and one of four in the West Cape (see map below).

Expo in South Africa turns 38 in 2018 and the organization's approach has proven itself to inspire and develop many young scientists and researchers. The role that Expo can play and the contribution it can make to encourage and promote science and technology in schools, are recognized more and more by collaborators such as the education departments, universities and industry.

Participation starts with dedicated teachers in schools who inform, inspire and guide their learners to engage in scientific research projects. A number of workshops for teachers and learners help to get newcomers going in the right direction.

Since 2015 Eskom has sponsored the appointment and inputs of mentors in selected schools. The purpose is to establish a culture of research and innovation, and to broaden the participation of learners in the regional and national Expo for Young Scientists competition.



LEARNING ENHANCEMENT

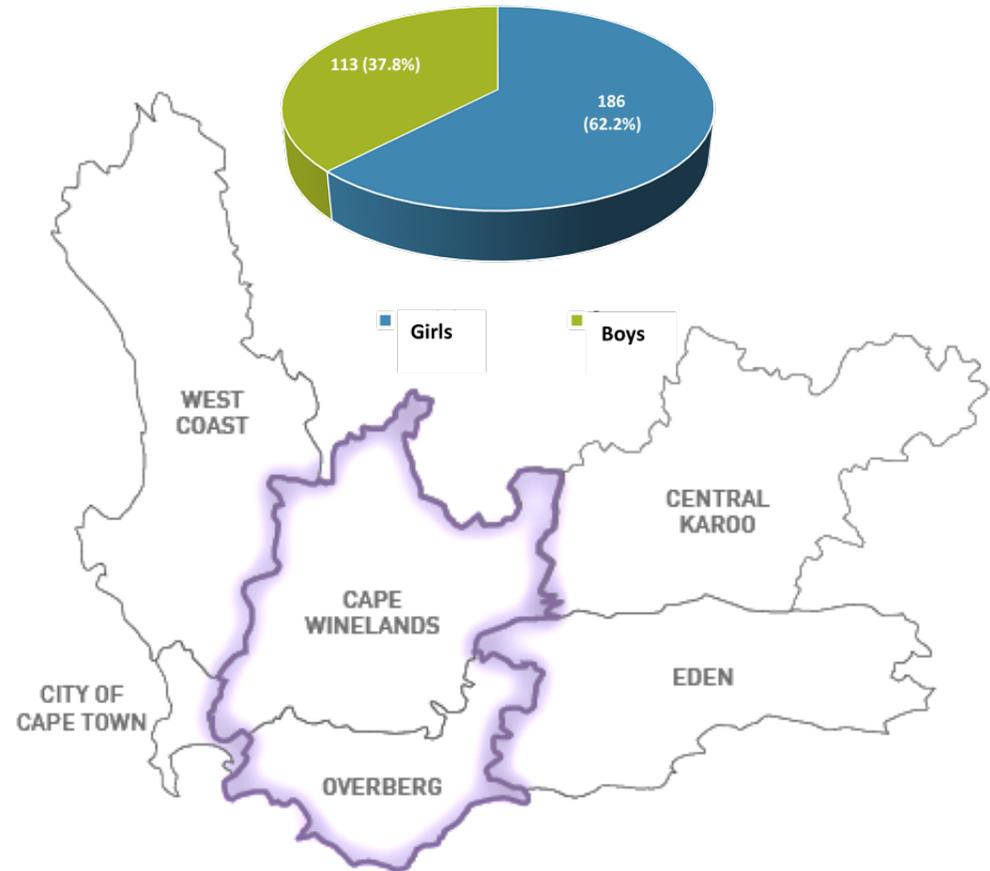
Eskom Expo for Young Scientists

Workshops are offered to teachers from schools who want to participate in Expo. They are also encouraged to sign up for judging. Training is provided to all new or inexperienced judges.

At the regional exposition 299 learners from 22 schools exhibited their research projects. 87 learners were from disadvantaged communities. One hundred and ninety one projects were exhibited by individuals and 54 by groups (pairs). Eighty eight dedicated, volunteer judges spent time and energy to assess the exhibited projects to award 30 gold medals, 65 silver and 74 bronze medals. Outstanding projects were also awarded with 51 special prizes.

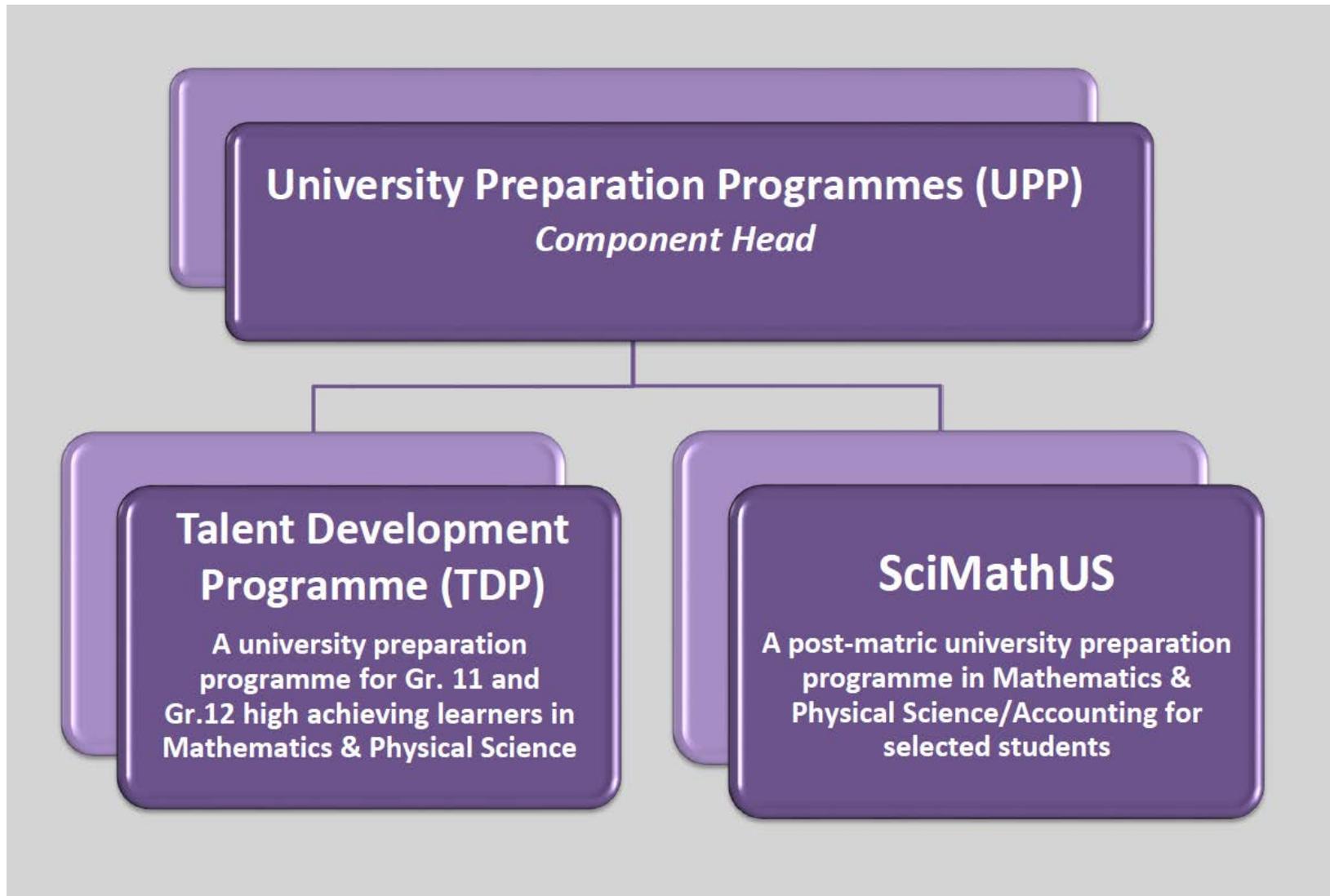
Fifteen projects from 14 schools were selected to represent Stellenbosch region at the national competition. Every single participant did us proud with impeccable conduct and the presentation of an upgraded, interesting, well-polished project with no ethical problems.

Fransie Streicher, a Grade 12 learner from Hermanus who received the prestigious Derick Gray Memorial Award at ISF in 2016 but who was too young to make use of the opportunity, used this chance in December 2017 to present his research at the Swedish International Youth Science Seminar in Stockholm, Sweden.



UNIVERSITY PREPARATION PROGRAMMES

Two types of University Preparation Programmes are offered, one for learners in their final years of schooling (TDP) and one for learners who have passed NSC but did not meet entry-level requirements for University study (SciMatUs).



UNIVERSITY PREPARATION PROGRAMMES - SciMathUs

More than 600 students applied after the release of the 2016 NSC results in January 2017. The Scimathus selection team once again faced the unenviable task of selecting a new cohort of 100 students from all the applications received. The selection team eventually settled for a cohort of 101 students.

These students, together with their families, were welcomed at the official SUNCEP-SciMathUs opening ceremony in January. They were introduced to members of staff, shown the venues where they would attend classes in 2017 as well as the hostel where they would be accommodated. They were now officially Young Maties!!

The year 2017 was once again an eventful year filled with highlights...indeed another year in which the SciMathUs Programme growing tirelessly towards achieving its primary aim of being an ACCES Programme of excellence. This was once again clearly demonstrated when 66 ex-SciMathUs students graduated in different fields of study at the Stellenbosch University Summer Graduation Ceremony.

With the success achieved in 2017 the SciMathUs closing ceremony was once again a proud and joyful moment spent with university personnel and funding partners.

Table I: Former SciMathUS students that graduated in 2017

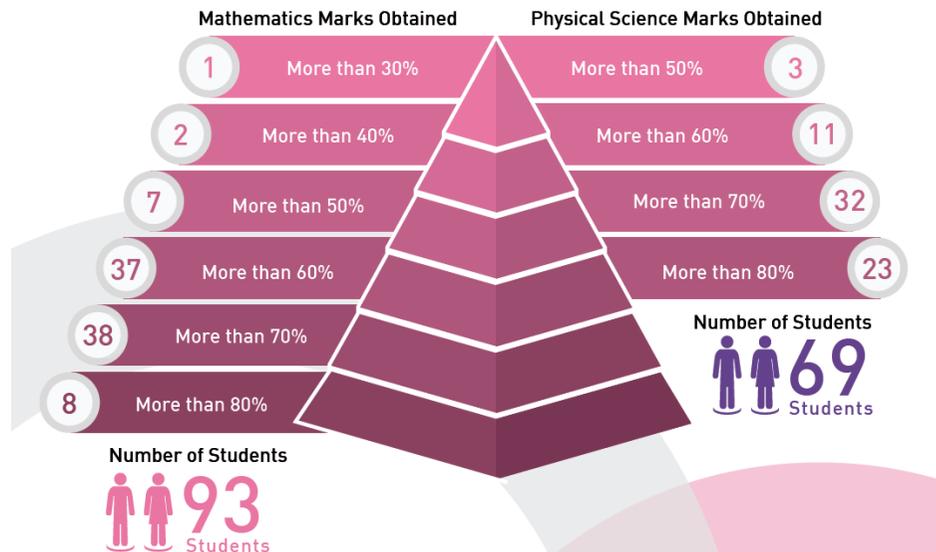
Faculty	Number of undergraduate degrees awarded	Number of post-graduate degrees awarded
Social Science	6	
Medicine and Health Science	5	
Science and AgriScience	22	2
Engineering	1	
Economic and Management	13	6
Education	6	5
Total number of degrees	53	13



UNIVERSITY PREPARATION PROGRAMME - SciMathUs



The summary of our 2017 result is;

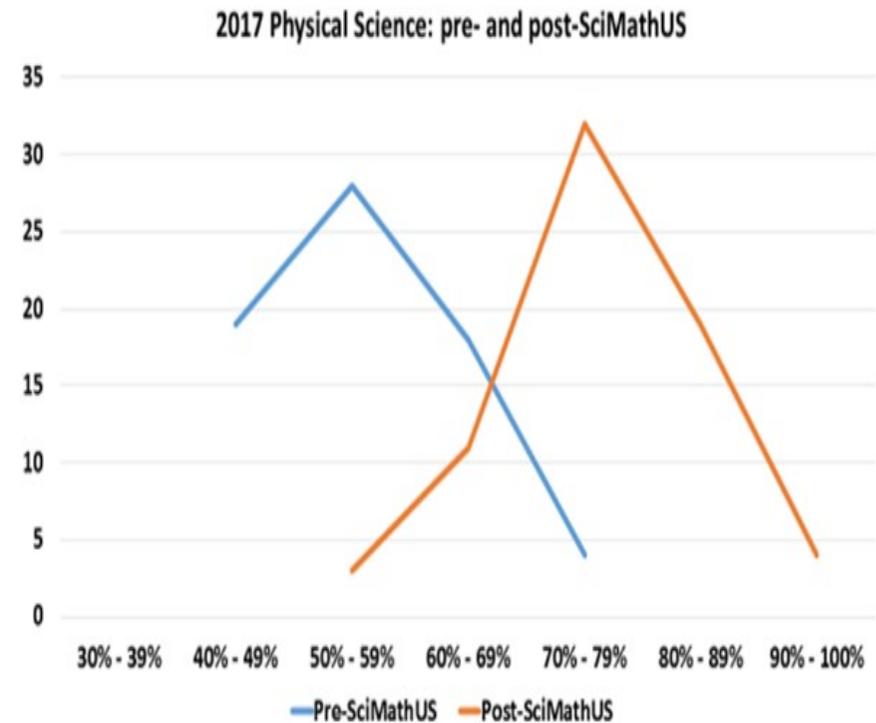
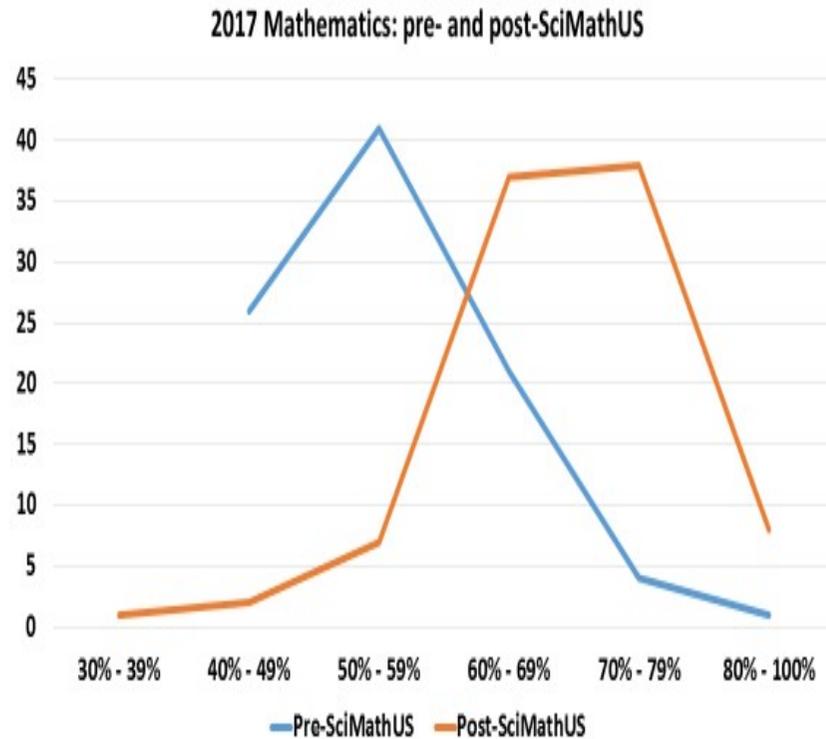


UNIVERSITY PREPARATION PROGRAMME - SciMathUs

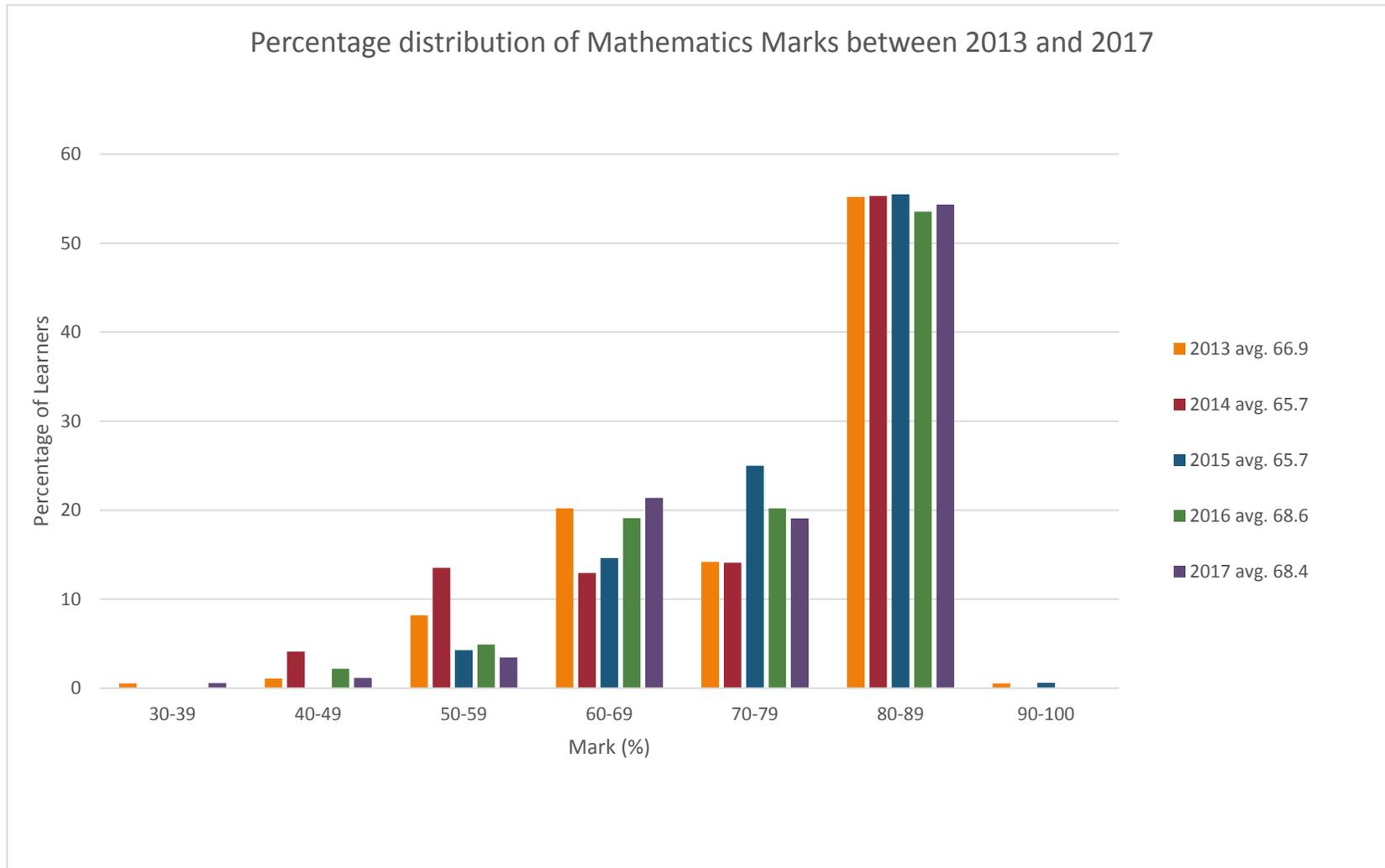
Below are the graphs that show the improvement achieved by the 2017 SciMathUS cohort

The blue line indicates the original marks of the students before joining the SciMathUS programme.

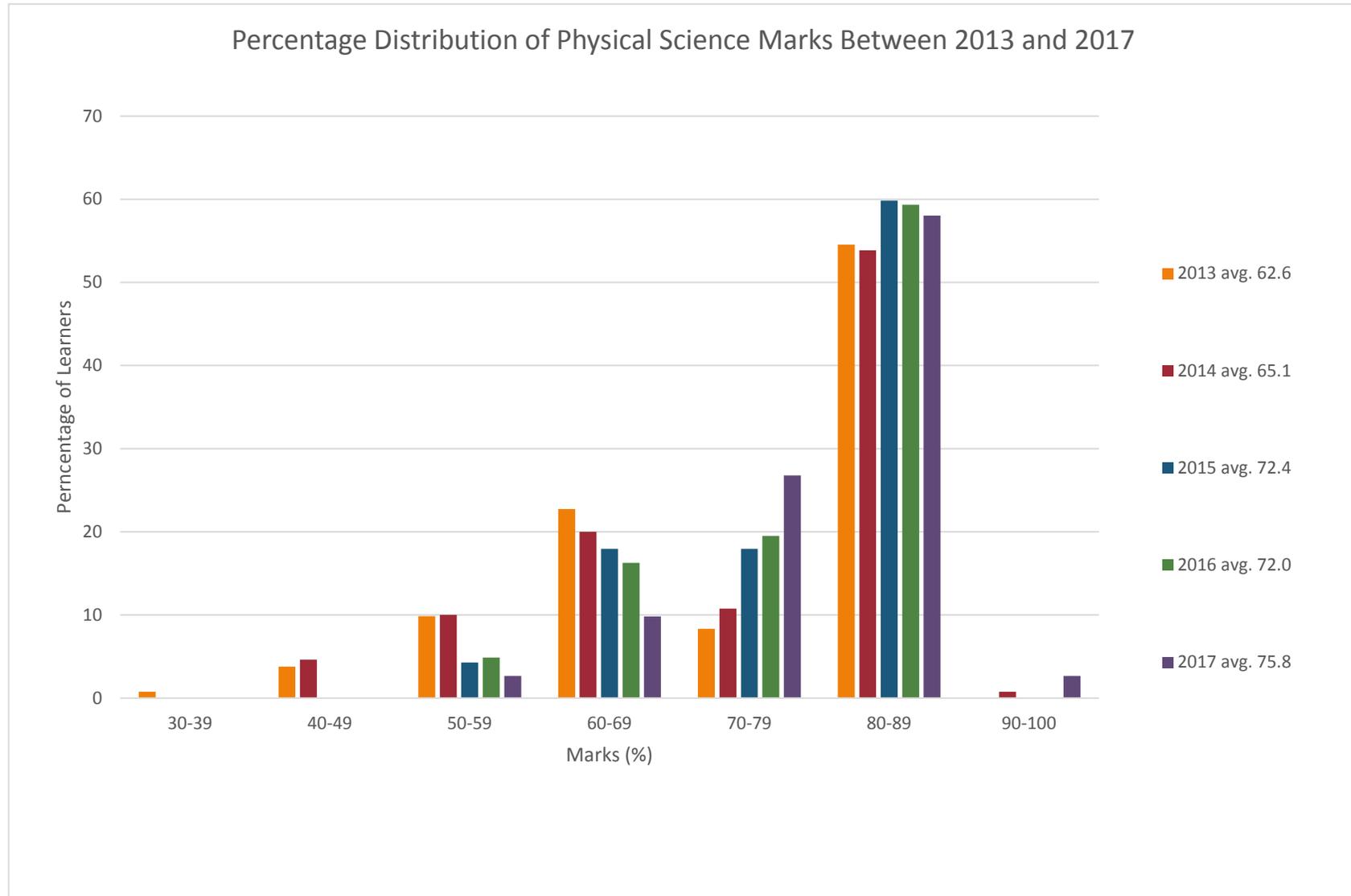
The orange line indicates the improved mark obtained by the students after the SciMathUS intervention.



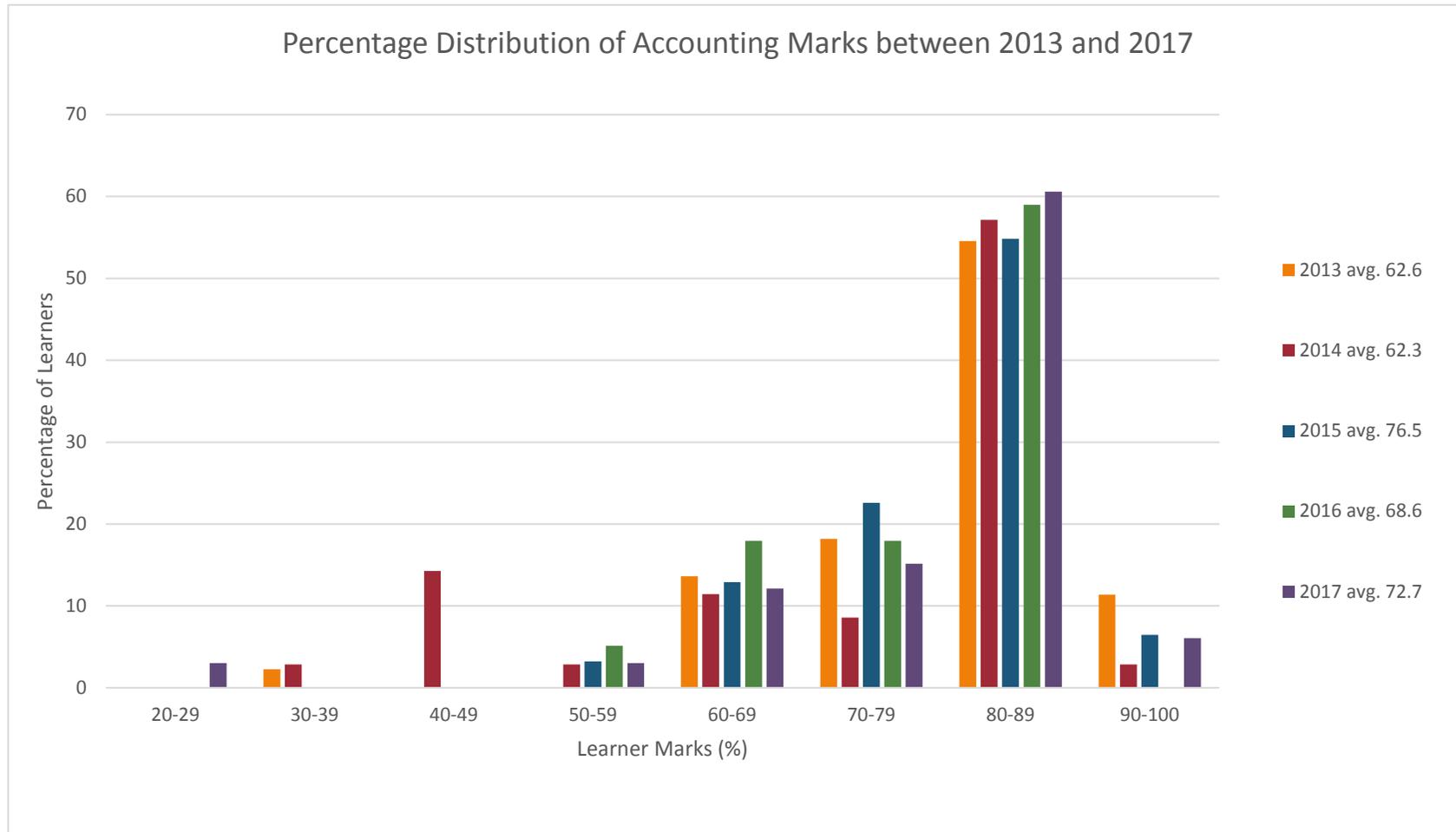
UNIVERSITY PREPARATION PROGRAMME - SciMathUs



UNIVERSITY PREPARATION PROGRAMME - SciMathUs



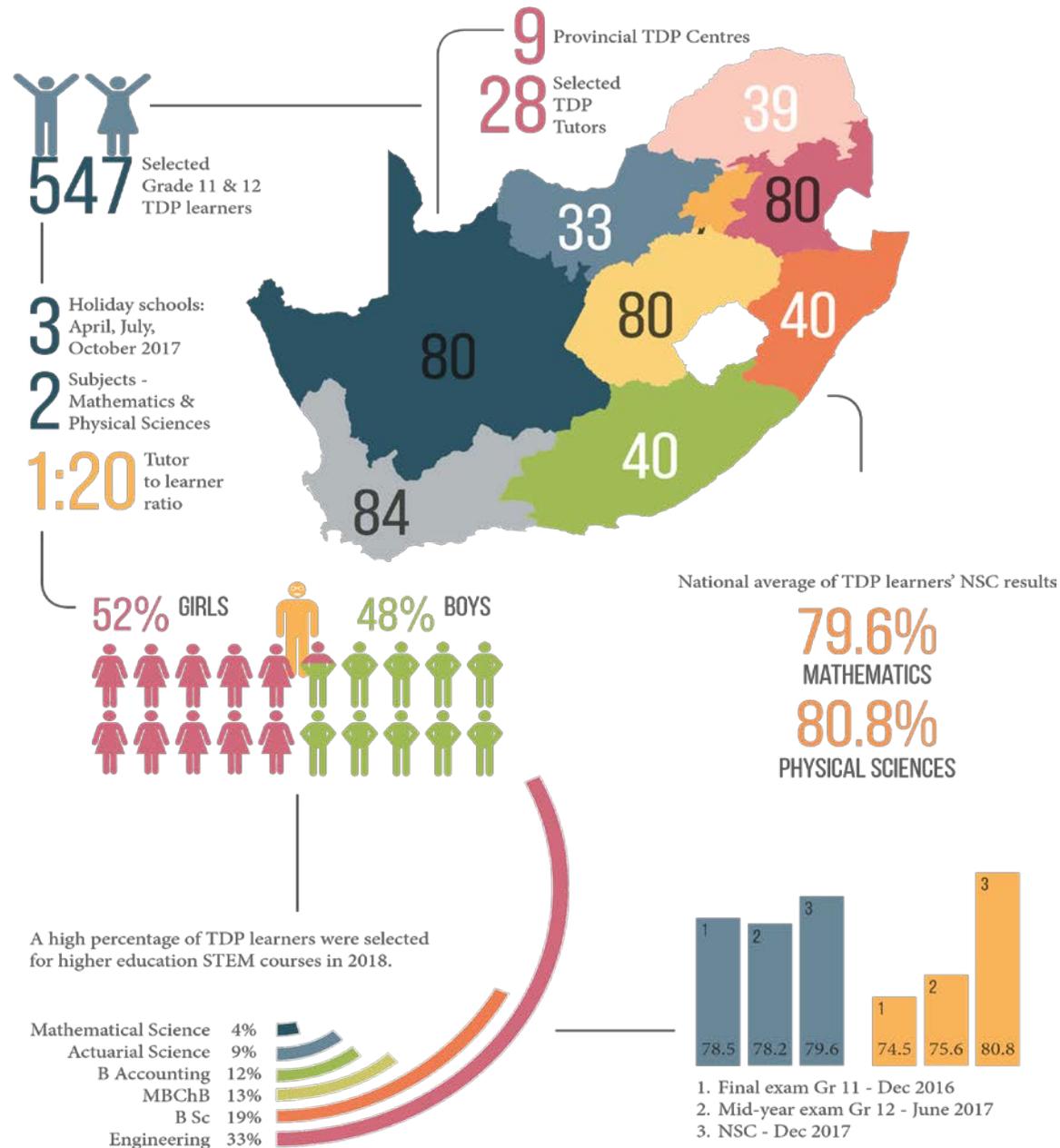
UNIVERSITY PREPARATION PROGRAMME - SciMathUs



UNIVERSITY PREPARATION PROGRAMME - SciMathUs



UNIVERSITY PREPARATION PROGRAMME – TDP



UNIVERSITY PREPARATION PROGRAMME - TDP

Under the management of the Stellenbosch University Centre for Pedagogy (SUNCEP) and in collaboration with Provincial Education Departments (PEDs) and the Department of Science and Technology (DST), the third phase of the Talent Development Programme (TDP) was implemented in 2017. The first year of the TDP has seen the inception and successful implementation of a supplementary academic intervention that provided participants with an opportunity to engage in challenging Mathematics and Physical Sciences programmes and exposed them to valuable foundational skills. The infographic summarises the 2017 highlights of the inception and implementation phases of the TDP and illustrates the impact of the programme after the first year

Nine provincial TDP centres were established and provincial coordinators, centre administrators and 28 experienced tutors were appointed. A total of 547 selected Grade 11 and 12 learners participated in three holiday schools that were hosted at the provincial TDP centres. These holiday schools were very fruitful and positive feedback was received from coordinators, tutors and learners. Monitoring and evaluation reports were analysed, challenges were addressed and the programme was adjusted according to recommendations from the stakeholders.

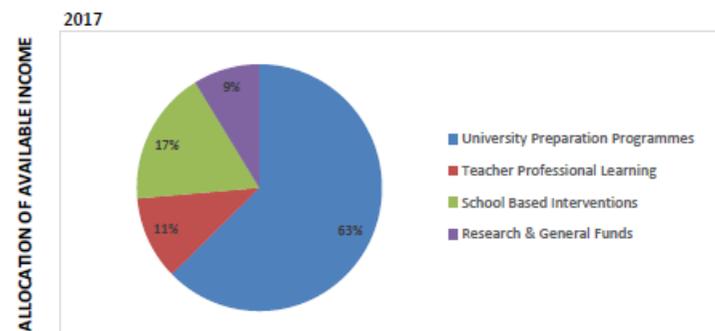
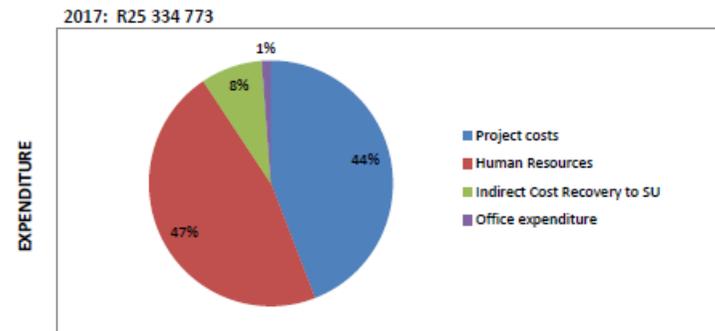
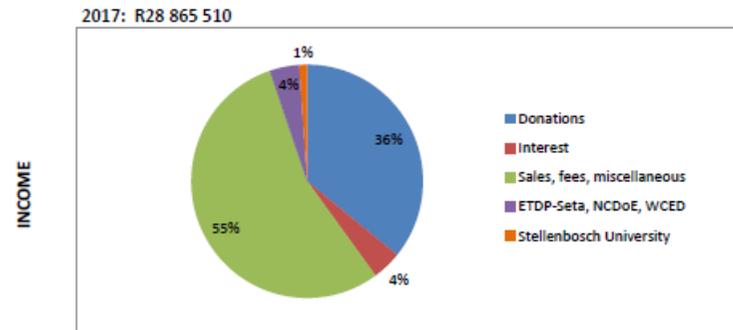
To evaluate the impact of the TDP on the first cohort of learners and determine whether the objectives of the programme were achieved for the first year of implementation, the academic performance, skills development and selection for tertiary education of the Grade 12 TDP learners were considered. The TDP learners performed extremely well in Mathematics and Physical Sciences in the 2017 National Senior Certificate exam and national averages of 79.6% in Mathematics and 80.8% in Physical Sciences were achieved. Furthermore, improvements of 6.5% in Physical Sciences and 1.1% in Mathematics from Grade 11 to 12 were reported. Excellent academic results enabled a high percentage of the first cohort of TDP learners to be selected for STEM-based higher education courses and to be on their way to pursue careers in these fields.

Since the academic programme and learning materials of the TDP are aimed at empowering learners to attain high levels of competency in challenging subject matter, they are challenged to fulfil their full potential. Apart from the academic input, the TDP participants were also equipped with effective study methods and time management tools. The application of the knowledge and the foundational skills that the TDP learners have acquired during the holiday schools may have contributed to the achievement of the abovementioned results.



CORPORATE SERVICES

Finances



The component head of corporate services (established in 2017) is responsible for managing the systems that support the SUNCEP operations required for efficient delivery of its mandate.

- Financial Management and procurement
- Human resources and Asset management
- Knowledge/Information management and Liaising with legal services



RESEARCH

Publications

- **Ndlovu, M.** & Mostert, I. (2017/2018). Teacher perceptions of Moodle and throughput in a blended learning in-service programme for secondary mathematics. *Africa Education Review*, 15(2): 131-151. Available from <https://doi.org/10.1080/18146627.2016.1241667>
- **Ndlovu, M.** (2017/2018). Themes in Mathematics Teacher Professional Learning Research in South Africa: A Review of the Period 2006–2015. In Kaiser H Forgasz, M Graven, A Kuzniak, E Simmt & B Xu (Eds). (2018) *Invited lectures from the 13th International Congress on Mathematical Education*, pp. 385-399. Springer. Available from: https://link.springer.com/chapter/10.1007/978-3-319-72170-5_22. Or https://doi.org/10.1007/978-3-319-72170-5_22

Ongoing Component Research Projects

- **SBI Research Project:** Learners' perceptions of mathematics and science supplementary tuition programmes: a case study of holiday school programmes in two provinces of South Africa – Project Leaders: Mdu Ndlovu & Andrew Fair.
- **TPL Research Project:** Live streaming as a learning support platform for rural teachers on a SUNCEP teacher professional learning programme – Project Leaders: Mdu Ndlovu & Ramesh Jeram.
- **FINLO Research Project:** Understanding the problem-based learning approach in a foundation programme at a South African university – Project leader: Mdu Ndlovu

International Conferences in 2017

- **Fair, A:** Connecting six farm schools using a virtual school hub. *25th Annual conference of the Southern African Association for Research in Mathematics, Science and Technology Education (SAARMSTE)*, Central University of Technology (CUT), Bloemfontein, 17 – 20 January 2017 p. 467.
- **Ndlovu M,** Du Plessis H, & Fourie-Malherbe. (2017) The effect of taking advanced programme mathematics on the transition from school to first year university mathematics, *25th Annual conference of the Southern African Association for Research in Mathematics, Science and Technology Education (SAARMSTE)*, Central University of Technology (CUT), Bloemfontein, 17 – 20 January 2017, p. 140.
- Lourens, E. (2018). From graduate to employee_teaching to become a professional. *ACURIT conference* on the Augustana Campus, University of Alberta, Edmonton, Canada, 3-5 May 2017.
- Bosan PN & **Ndlovu M,** (2017). A Nigerian teacher and his class's perceptions of the extent to which secondary mathematics teaching practices embrace mathematical modelling, *18th International Conference on the Teaching of Modelling and Applications (ICTMA-18)*, 23- 28 July 2017, Stellenbosch University, Bellville, South Africa.

- **Ndlovu, M. (2017):** LOC member of the *International Conference on the Teaching of Modelling and Applications (ICTMA-18)*, 23- 28 July 2017, Stellenbosch University, Bellville, South Africa.
- **Pfeiffer, CR. (2017):** LOC member of the *International Conference on the Teaching of Modelling and Applications (ICTMA-18)*, 23- 28 July 2017, Stellenbosch University, Bellville, South Africa.
- **Ndlovu, M. (2017).** Appointed member of the Scientific Committee of the International Conference on Education and New Developments (END 2017).
- Lourens, E (2017). Graduate employability – turning pressures into possibilities? EAIR 39th Annual Forum at the University of Porto, Portugal, from 3-6 September 2017.

National conferences, symposia and colloquia attended in 2017

- **Fair, A. (2017).** Inquiry-based professional development of science teachers using mentoring, telematics and social media platforms, Community of Practice Forum in Mathematics and Science (CoP-MS), Department of Basic Education, Head Office, Pretoria, 26-27 September.
- **Hanekom, P. (2017).** Attended the Southern African Association for Research in Mathematics Science and Technology Education (SAARMSTE) Research School, University of the North West, North-West Province, 10-13 July 2017.
- **Philander, C. (2017).** The professional development of natural sciences teachers: possibilities of a community of practice. *2017 Stellenbosch University Scholarship of Teaching and Learning (SoTL) Conference*.

Other research activities

- Postgraduate supervision of 6 PhD and 2 Masters students.
- External examination of 2 PhD and 6 Masters theses.
- Chaired Departmental Review panel for the School of Science and Mathematics Education (SSME).
- Peer review of 8 accredited journal articles and national conference papers, 3 accredited international conference papers and 2 international book chapters.
- Peer review of 1 international application for promotion to full professorship.
- Peer review of numerous abstracts for national and international conferences.

Individual practice-based research projects and progress status

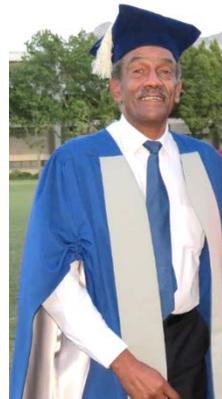
- Cerenus Pfeiffer – PhD in Curriculum Studies with specialization in Mathematics Education (graduated in December 2017)
- Pauline Hanekom – PhD in Curriculum Studies with specialization in Science Education (ongoing)
- Christa Philander – PhD in Curriculum Studies with specialization in Science Education (ongoing)
- Ramesh Jeram – PhD in Education Policy Studies (ongoing)
- Danelda van Graan – MPhil in Higher Education (ongoing)

2017 HIGHLIGHTS

- Dr Cerenus Pfeiffer (SciMathUS Mathematics Facilitator) completed his research studies: PhD in Curriculum Studies. Thesis title: A study of the development of mathematical knowledge in a GeoGebra-focused learning environment. Promoter: Prof Mdu Ndlovu, Deputy Director of SUNCEP, Co-Promoter: Dr Kosie Smit.



- Dr Trevor van Louw received the Chancellor's award for continued outstanding work in the South African society.



ACKNOWLEDGING OUR FUNDERS

Sincere gratitude for your dedicated partnership

AM Le Roux

Anglo American Chairman's Fund

Atlantis Industrial Initiative consisting of:

- AMC Cookware
- Atlantis Foundries
- GRI Wind Steel SA
- Pres Les
- Seagull Industries
- Stripform Packaging
- Swartland Investments

Bosjes Trust

Community Chest

Department of Science and Technology

Eskom Development Foundation

Eskom Expo for Young Scientists

ETDP SETA

Het Jan Marais Nationale Fonds

JB Marks Education Trust Fund

Johann & Gaynor Rupert foundation

MAD Leadership Foundation

NCED

Nedbank Eyethu Community Trust

Nordex Education Trust

Overberg Gemeenskapstrust

PA & Alize Malan Gedenktrust

Rand Merchant Bank Fund

R Domingo

Rupert Onderwysstigting

SATVI

Siyakha Education Trust

Stellenbosch University

Stichting Wilde Ganzen

Toyota SA

Trans Hex Operations

Tronox-Namakwa Sands

WCED

West Coast Resources

All private funders

SUNCEP GOVERNING BODY

Sincere gratitude for your guidance and support

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Dr P Beets (WCED)

Mr J Benjamin (WCED)

Ms F Fredericks (Stellenbosch University)

Ms N Landingwe-Mcoso

Prof L Le Grange (Stellenbosch University)

Prof N Davids (Stellenbosch University)

Dr Trevor van Louw (Director: SUNCEP)

Prof M Ndlovu (Deputy Director: SUNCEP)