

Annual Report 2013



asme

CENTRE FOR THE ADVANCEMENT OF SCIENCE AND MATHEMATICS EDUCATION



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Trust Registration No: T623/85

Non-Profit Organisation No: 54-244 NPO

A Section 18A Public Benefit Organisation No: 930023209

1. INTRODUCTION AND BACKGROUND

The Centre for the Advancement of Science and Mathematics Education (CASME) is a non-profit education development agency that strives to improve the quality of mathematics and science education. It achieves this through the professional development of educators and the provision of educational resources to historically disadvantaged communities.

Founded in 1985 the aim of the organisation from the start was to address systemic imbalances in mathematics and science education.

The organisation possesses a wealth of experience and expertise in teacher professional development and implements a range of interventions in partnership with government, corporate social investment programmes, universities and national development initiatives, amongst others.

CASME's key focus is on the advancement of mathematics and science teachers' subject competence and teaching skills in South African schools. From its inception, the organisation has provided in-service training to maths and science teachers mainly from poorly resourced and rural schools, while learners receive educational support through a number of tailored programmes.

Our Vision: *"To be the leading Centre for Advancing the teaching and learning of Mathematics, Science and Technology in South Africa."*

How we achieve this vision is articulated in our Mission: *"To research, develop, evaluate and provide access to quality educational resources, continuing teacher professional development opportunities and school-based support to advance the teaching and learning of mathematics, science and technology education in disadvantaged, under-resourced and rural schools in South Africa."*

2. ACTING DIRECTOR'S REPORT

The beginning of 2013 saw the departure of our Director Mr Themba Mthethwa to take up a position as content advisor with Joint Portfolio Committee on Education and Culture within the Parliament of South Africa. Mr Mthethwa served as Director from 2010 to 2012. During Themba's term CASME saw closer involvement with the Department of Basic Education and a push beyond KwaZulu-Natal into other provinces.

Mr Mthethwa, alongside the Deputy Director, Mr Henre Benson, were able to finalise a Memorandum of Understanding with the University of South Africa which paved the way for the implementation of an accredited Certificate Programme for 300 Mathematics and Science teachers in two districts in KwaZulu-Natal. The partnership is expected to continue into 2014 with additional cohorts of teachers brought in and extension of the programme to senior primary school teachers.

Having concluded the purchase of 23 Caversham Road in Pinetown in late 2012, the premises which would serve as the operational base for CASME, the first half of 2013 saw the refurbishment of the property taking place. The result is an education centre that comprises an e-Learning Study Centre, Teachers' Café, multipurpose training venues and a Science Teachers' Resource Centre. CASME formally took occupation in July 2013 with Chairman of the Board of Trustees, Professor John Volmink officially opening of the new centre on 22 November 2013.

Despite the departure from the Edgewood Campus of the University of KwaZulu-Natal, the move is seen as strategic with a view to opening up opportunities for broader and deeper partnerships with the Higher Education Sector. The existing partnership with universities such as UKZN and UNISA generated income of approximately R1,5 million in 2013. There has been an effort to bring on board other local universities and so far the response is positive. CASME has also established good relationship with Free State, Mpumalanga, Gauteng, KwaZulu-Natal and Eastern Cape Departments of Basic Education.

Following a report on maths and science education initiatives commissioned by the BHP Billiton Foundation, CASME was shortlisted to develop a high level concept document for the implementation a mathematics and science education initiative expected to roll out over five years from 2015 to 2019 in four provinces in South Africa. Simply being selected at this stage of the process is testament to CASME's reputation in the field.

In 2013 CASME had a direct impact on some 600 schools, over 2000 teachers and 6500 learners.

Our indirect impact on learners is in excess of 100,000 which continues to support our value proposition of working with teachers in order to reach learners.

Education projects were carried out in 8 of the 9 provinces in South Africa. Projects have covered the full spectrum of primary and secondary schooling with continuing growth in the General Education and Training Band (Grades R to 9). The focus on GET programmes has increasingly been on equipping and supporting to schools to effectively implement the Curriculum and Assessment Policy Statements (CAPS) and thereby improve performance in the Annual National Assessments.

In the FET Band programmes have now come to have an embedded ICT Integration strand in keeping with CASME's strategic focus on building the capacity of schools and teachers to improve utilisation of these tools for effective teaching and learning. In addition the integration of Geometry and Probability in the 2014 National Senior Certificate has been a particular focus, alongside ever more rigorous application of assessment of practical work in the Physical Sciences.

Staffing

CASME's core operations are supported by 16 full time staff members and approximately 40 part-time contractors and consultants.

Human Capital development continues to be supported by CASME. In 2013 we continued with our internal professional development training programme with a particular focus on the use of Information and Communication Technology in teaching Mathematics and Science.

In addition, the Zenex Foundation funded Inkanyezi Project created a platform for the cascading of new learning in the fields of differentiated instruction and diagnostic assessment as part of an action research project.

2014 Outlook

In 2014 CASME is expected to maintain managed funds at the level of between R6 and R8 million.

Key initiatives are planned for development and or implementation in the medium term, namely:

- **Establishment of the E-Learning Study Centre**

A growing body of evidence suggests that providing opportunities for learners to engage in self-paced, self-directed learning powered by ICT tools has the potential to assist with the filling of knowledge gaps and ultimately improve their conceptual understanding and performance in mathematics and science. Within CASME's newly established education centre, CASME has earmarked space for an e-Learning Study Centre. A offer from BHP Billiton for refurbished laptops has been made which will provide the necessary resources.

- **Expanding Accredited Short Programmes**

CASME's partnership with UNISA which saw the introduction of two accredited programmes for high school mathematics and science teachers in 2013 has provide leverage for the development of our programmes into a structure that will allow for accreditation. It is expected in 2014 that we will achieve provisional accreditation with the ETDP SETA.

Appointment of Chief Executive Officer

During the course of 2013 the Board of Trustees advertised the position of Chief Executive Officer following a restructuring of the top management structure of the organisation. In the latter part of 2013 the Board of Trustees finalised its recruitment and selection process with the incumbent expected to assume responsibilities at the start of 2014.



Henre Benson

ACTING DIRECTOR

3. BOARD OF TRUSTEES AND STAFF

Board of Trustees

Prof John David Volmink (Chairman): During 2013 Prof Volmink served as CEO of the National Education Evaluation and Development Unit (NEEDU) within the National Department of Basic Education having previously served as Chair of Umalusi, the Council for Quality in General and Further Education and Training. Prof Volmink's association with CASME began when he worked as Director from 1991 to 1996 after returning from teaching positions in Botswana and Cornell University. He has served on several Ministerial Commissions and Task Teams on Education as well as on the Boards of education NGOs such as the Media in Education Trust, Africa Ignite, and the Environment and Language Education Trust amongst others.

Prof Renuka Vithal: Currently serves as the Deputy Vice Chancellor: Teaching and Learning at University of KwaZulu-Natal, having previously held the position of Dean of the Faculty of Education. Prof Vithal has served as an advisor on a number of Ministerial Committees and Task Teams on Education.

Dr Shamritha Bhikha: Chief Director: Accreditation in the National School of Government. Dr Bhikha started her career as a teacher, then serving as a lecturer, an Education Specialist, Deputy Director responsible for teacher education in the National Department of Education and Director of Standards Setting and Development in the South African Qualification Authority before taking up her present position.

Mr Magnate Ntombela: Regional Director for KwaZulu-Natal at the University of South Africa. Mr Ntombela previously served as Director of CASME and the Primary Science Programme before moving over to Higher Education.

Mr Sifiso Mncube: Divisional Procurement Manager at Foskor. Mr Mncube started his association with CASME whilst still working as a Development Officer at the University of KwaZulu-Natal Foundation before taking up a position as the Black Economic Empowerment and Supplier Development Manager at Foskor.

Dr Herbert Khuzwayo: Department of Mathematics, Science and Technology Education at the University of Zululand. Dr Khuzwayo completed his PhD through Aalborg University in Denmark. Dr Khuzwayo has served as part of an international education research collaboration namely The Learner's Perspective Study and was selected for a Fulbright Scholarship through which he conducted research at the University of Athens, Georgia in the United States.

Management Staff

Mr Henre Benson – Acting Director

Ms Fynall van Rooy – Office Manager

Mr Sizwe Khumalo – Project Administrator and Resource Centre Manager

Programme Staff

Mr Sandile Hlongwane

Mr Themba Leslie Ndaba

Mrs Nokuthula Xulu

Mr Mokhulu Matshika

Mrs Thami Mahlobo

Mr Bongani Dlamini

Mr Mbongiseni Gumede

Support Staff

Mr Zamokuhle Nxumalo - Pietermaritzburg Centre

Miss Bongiwé Buthelezi - Msinga Centre

Mrs Linda Memela - Phungashe Centre

Miss Sinenhlanhla Xulu - Richards Bay Centre

Mr Dumisani Sihlangu – Ndwedwe Centre

Miss Thandiwe Nzimande – Edgewood Centre

4. PROJECTS

CASME managed 15 ongoing projects across South Africa. The following table summarises the beneficiary reach of the projects with a comparison to the preceding two years.

Whilst it is important that CASME maintains and grows its quantitative impact, from a cost benefit and operational efficiency perspective, it is also important that CASME acknowledge that the type of programmes offered must respond to developing needs of teachers and the schooling sector in South Africa.

Where more intensive engagement is required this may require and where existing capacity is constrained, this can lead to fewer schools, teachers and learners being targeted.

We are pleased to have maintained a relatively consistent reach in terms of the number of schools, teachers and learners reached as summarised below.

	Learners reached			Educators reached			Schools reached		
	2011	2012	2013	2011	2012	2013	2011	2012	2013
GET (Grade 1 to 9)	3000	4967	6000	299	540	473	85	260	212
FET (Grade 10 to 12)	4062	3614	454	928	1642	1563	180	623	372
RESOURCE CENTRES	4806	20685	23193	202	856	238	85	127	121
TOTAL	11868	28666	29647	1429	3038	2274	350	1010	705

Some project highlights from 2013



The following section summarises the key focus areas of CASME's programmes: **Resourcing for Teaching and Learning**, **Teacher Professional Development** and **Support for Learners**.

Resourcing for Teaching and Learning

The tools and equipment for teaching and learning of mathematics and science are an essential part of what CASME offers through its programmes. With its newly established Education Centre teachers and learners have access to a facility for hands on, practical learning in a multifunction venue that includes laboratory workstations and interactive electronic teaching aids.

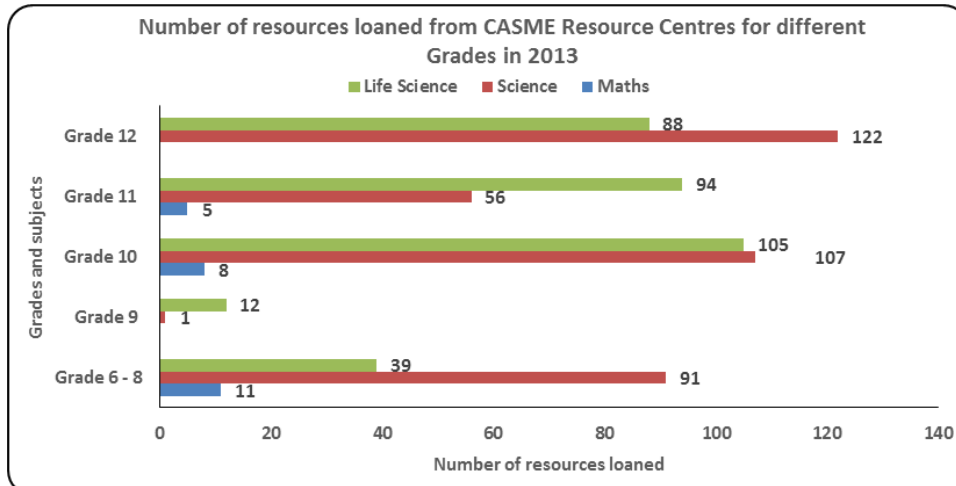
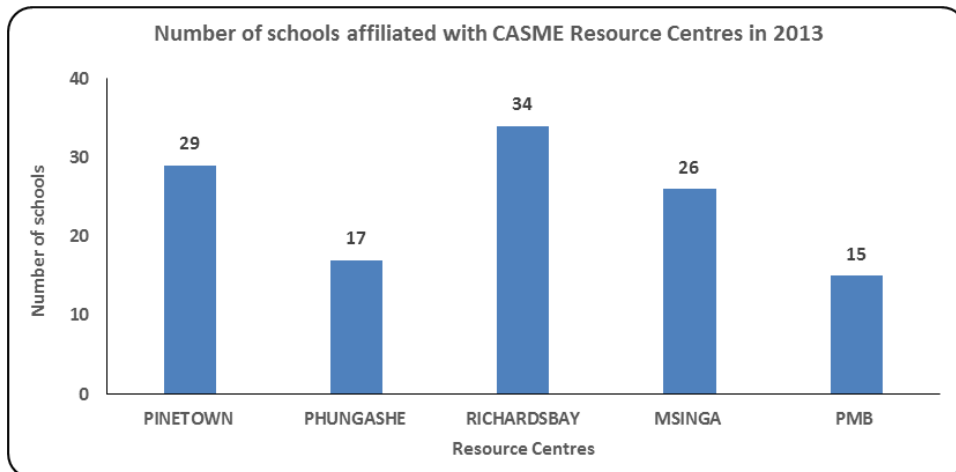
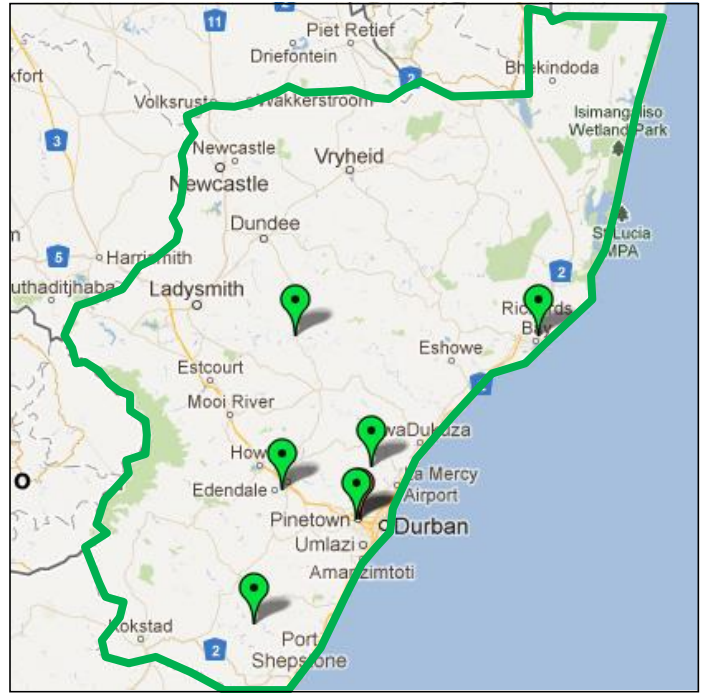


Resource Centres

In 2013 CASME operated six resource centres in the KwaZulu-Natal Province. The centres provided videos, charts, experiment kits and other educational resources to teachers from affiliated schools on a loan basis. The purpose of providing the resources on loan is that they can be used by teachers to make mathematics and science learning more interesting and easier to understand.

The centres are located as depicted on the map alongside in Phungashe, Msinga, Pinetown, Ndwedwe, Pietermaritzburg and Richards Bay.

The resources are of particular assistance to teachers and learners because many schools do not have laboratories where they can do practical work. This is critical in the current environment when practical work is examined and there is a much greater emphasis on it than previously.

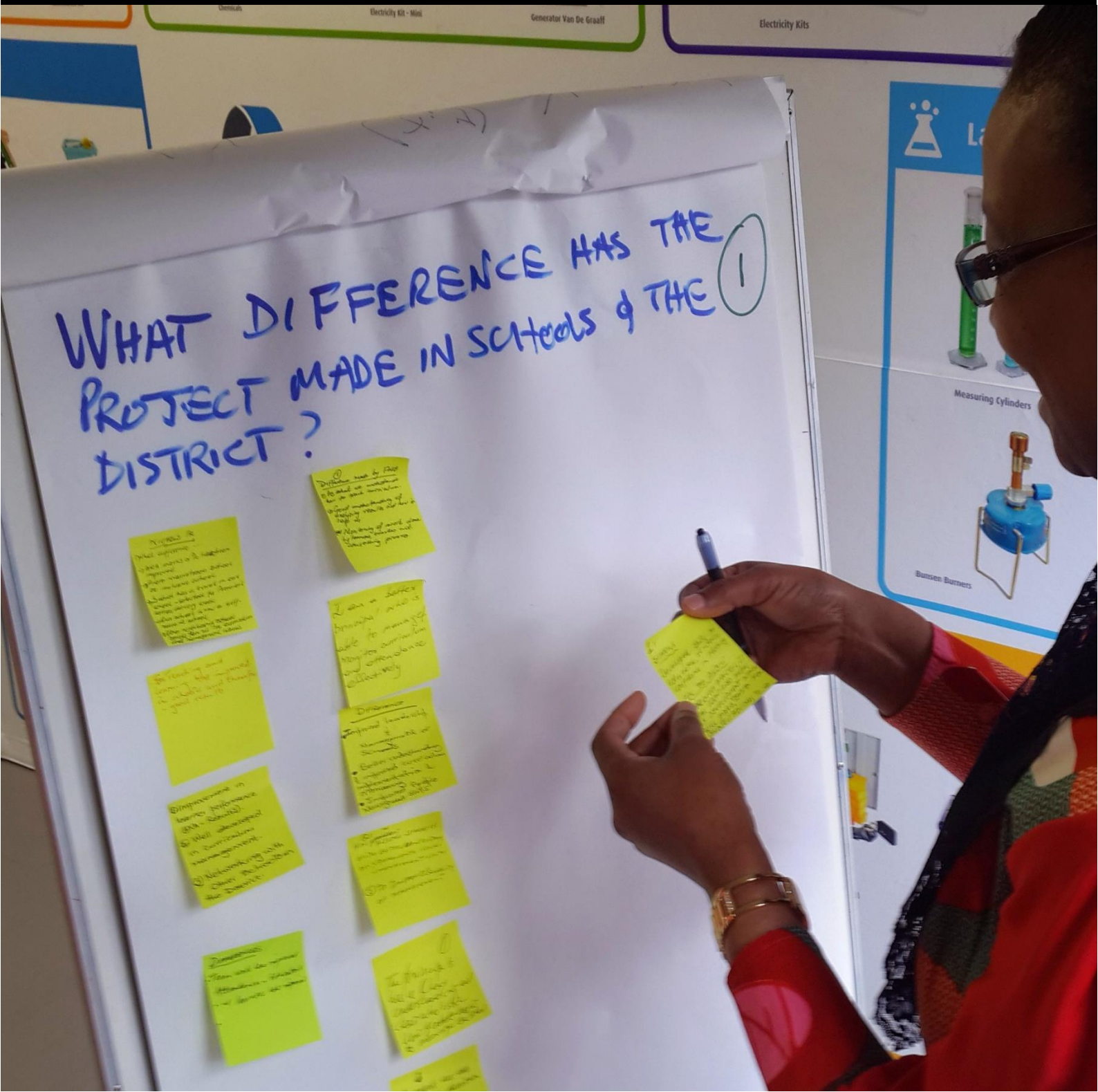


In 2013 CASME continued its programme of practical work training for teachers at schools within the vicinity of Resource Centres. The programme has become a valuable source of support for teachers with little experience of facilitating practical work in their classrooms.



Teacher Professional Development

At the core of CASME's value proposition is a focus on teachers. Without supporting teachers to improve their pedagogical and content knowledge competence we cannot hope to sustainably address our education challenges in mathematics and science.



Teacher Professional Development and Support

During 2013 CASME provided a range of professional development and support programmes for teachers which included formal programmes, short content and pedagogy workshops, training with a specific focus on science practical work and seminars focusing on exposing teachers to innovations in teaching practices which have included the integration of Information and Communication Technologies in mathematics and science teaching and learning. Include in the package of support, where funding has allowed, is in-school coaching and mentoring.

Teacher development activities fell under the auspices of programmes sponsored by The Transnet Foundation, The Zenex Foundation, SAPREF, Toyota Teach, Soul of Africa Trust, the Sugar Industries Trust for Education, the Vodacom Foundation, BHP Billiton, the Education Training and Development Practices (ETDP) Seta and Price Waterhouse Coopers.

Over 2000 teachers participated of which 300 were engaged in a formal Certificate Programme accredited through the University of South Africa.

Projects have varied quite significantly in size and shape. Small scale projects have targeted one or two schools, mid-sized projects have focused on a cluster of schools within a geographical area, whereas larger projects have been implemented on a district-wide basis reaching several hundred teachers.

The breadth and depth of programmes has similarly varied with some projects offering deep, continuous support which includes content and pedagogy training, in school support and provision of significant resources for teaching and learning.

In other cases the focus has been mainly on provision of training on content and pedagogy through regular workshops or tutorials.

ICT Integration in Mathematics and Science Education

On the back of the Vodacom Foundation Digital Classroom programme in which CASME developed and facilitated the pilot mathematics and science training programme for 640 teachers across 8 provinces, the approach to ICT integration support was consolidated. It has apparent that the effective utilisation of ICTs in schools goes beyond the integration of mathematics and science content and teaching strategy but there remains a need for a bespoke programme of elementary computer skills for teachers. CASME has developed a short programme with a particular focus on the basic computer skills that meet the immediate needs of teachers.

Teaching Teachers in Context

The context in which teacher professional development and support is delivered (namely the school and district in which teachers operate) is increasingly recognised as key to the sustainable improvement of the quality of teaching and learning. CASME is therefore strengthening the broader school and curriculum management elements of its programmes.

Support for Learners

CASME's programmes extend to direct support for learners through tuition but perhaps more importantly through advocacy for mathematics and science and information sharing on subject choices, post school study opportunities and career advice in Science Technology Engineering and Mathematics (STEM).



Wherever possible, learner programmes do not stand-alone but are embedded within a broader school and teacher development model that includes developing best practices for out-of-school-time programmes in a way that is more sustainable than an endless investment in learner tuition by external experts. During 2013 CASME's learner engagement was supported by the Transnet Foundation, Zenex Foundation, Soul of Africa Trust, Sugar Industries Trust for Education, SAPREF, MAHLE BEHR South Africa, Smiths Manufacturing, Toyota Teach, MySchool Foundation and RISO Africa.

Direct Tuition

Whilst CASME advocates teacher professional learning as a longer term, sustainable model of supporting education in South Africa, there is often a need for direct learner support. These programmes provide quick wins and also provide an opportunity to model best practices in under performing schools.

The tuition programmes operate exclusively during weekends and school holidays and are an attempt to provide both extension and remediation for the learners involved. CASME uses these sessions to address existing knowledge gaps and support learners in their exam preparation and assist with study skills and career guidance.

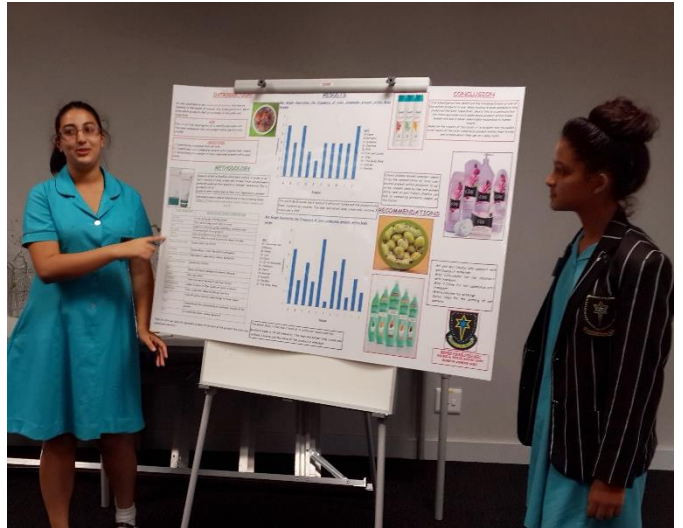
Learner Motivation and Guidance

In 2013 CASME formed a partnership with the University of KwaZulu-Natal's Science and Technology Education Centre (STEC) to engage Grade 9 learners in Subject Choice and STEM career information sessions. The programme reached 1200 learners. The programme is showing evidence that early information in the Grade 9 year of schooling contributes to improved subject choices in respect of Mathematics and improved motivation to invest time in studying Natural Science in order to ensure access to Physical Sciences in the Grade 10 year of schooling. The initial findings of the programme were presented at the South African Association of Science and Technology Education Centres conference in Durban.

Olympiads and Expos

There remain few opportunities for learners from under resources and rural schools to participate in Science and Mathematics Olympiads and Expo competitions. These regional, provincial and national competitions tend to be dominated by better resources suburban and urban schools. CASME's Olympiad and Expo programmes (which operate either as stand-alone initiatives or are embedded within broader education development programmes) aim to build the confidence of learners (and their teachers) to participate. Teachers are supported through workshops and learners are provided with guidance in developing their research projects. Learners participate in a combination of in-school competitions and inter-school competitions amongst selected schools, ultimately forming a pipeline into more mainstream events.

CASME has structured its Olympiad programmes to support the requirements of the Department of Basic Education's Annual National Assessment and is also utilising an item-analysis approach to support further intervention with teachers.



5. INDEPENDENT AUDITOR'S REPORT 2013

To the trustees of The Shell Science and Mathematics Resource Centre Educational Trust

We have audited the financial statements of The Shell Science and Mathematics Resource Centre Educational Trust, which comprise the statement of financial position as at 31 December 2013, and the statement of comprehensive income, statement of changes in equity and statement of cash flows for the year then ended, and a summary of significant accounting policies and other explanatory notes, and the trustees' report.

Trustees' Responsibility for the Financial Statements

The trusts trustees' are responsible for the preparation and fair presentation of these financial statements in accordance with the International Financial Reporting Standards. This responsibility includes: designing, implanting and maintaining internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error; selecting and applying appropriate accounting policies; and making accounting estimates that are reasonable in the circumstances.

Auditor's Responsibility

Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit in according with International Standards on Auditing. Those standards require that we comply with ethical requirements and plan and perform the audit to obtain reasonable assurance whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgement, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the financial statements present fairly, in all material respects, the financial position of The Shell Science and Mathematics Resource Centre Educational Trust as at 31 December 2013, and its financial performance its cash flows for the year then ended in accordance with the International Financial Reporting Standards.



Apex Chartered Accountants Inc
Registered Auditor
Issued 7 July 2014
Suites 1235-1242
Commercial City
40 Dr AB Xuma Street
Durban, 4001

5.1 TRUSTEES' RESPONSIBILITIES AND APPROVAL

The trustees are required to maintain adequate accounting records and are responsible for the content and integrity of the financial statements and related financial information included in this report. It is their responsibility to ensure that the financial statements fairly present the state of affairs of the trust as the end of the financial year and the results of its operations and cash flows for the period then ended, in conformity with the International Financial Reporting Standards. The external auditors are engaged to express an independent opinion on the financial statements.

The financial statements are prepared in accordance with the International Financial Reporting Standards and are based upon appropriate accounting policies consistently applied and supported by reasonable and prudent judgements and estimates.

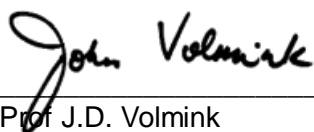
The trustees acknowledge that they are ultimately responsible for the system of internal financial control established by the trust and place considerable importance on maintaining a strong control environment. To enable the trustees to meet these responsibilities, the board sets standards for internal control aimed at reducing the risk of error or loss in a cost effective manner. The standards include the proper delegation of responsibilities within a clearly defined framework, effective accounting procedures and adequate segregation of duties to ensure an acceptable level of risk. These controls are monitored throughout the trust and all employees are required to maintain the highest ethical standards in ensuring the trust's business is conducted in a manner that in all reasonable circumstances is above reproach. The focus of risk management in the trust is on identifying, assessing, managing and monitoring all known forms of risk across the trust. While operating risk cannot be fully eliminated, the trust endeavours to minimise it by ensuring that appropriate infrastructure, controls, systems and ethical behaviour are applied and managed within predetermined procedures and constraints.

The trustees are of the opinion, based on the information and explanations given by management, that the system of internal control provides reasonable assurance that the financial records may be relied on for the preparation of the financial statements. However, any system of financial control can provide only reasonable, and not absolute, assurance against material misstatement or loss.

The trustees have reviewed the trust's cash flow forecast for the year to 31 December 2014 and, in light of this review and the current financial position, they are satisfied that the trust has or has access to adequate resources to continue in operational existence for the foreseeable future.

The external auditor's is responsible for independently reviewing and reporting on the trust's financial statements. The financial statements have been examined by the trust's external auditors and their report is presented on page 3.

The financial statements set out, which have been prepared on the going concern basis, were approved by the board on 7 July 2014 and were signed on its behalf by:



Prof J.D. Volmink



Dr S.D. Bhikha

5.2 TRUSTEES' REPORT

The Trustees submit their report for the year ended 31 December 2013.

Review of activities

Main business and operations

The trust is engaged in providing training services to the educational sector and operates principally in South Africa.

The operating results and state of affairs of the trust are fully set out in the attached financial statements and do not in our opinion require any further comment.

Going Concern

The financial statements have been prepared on the basis of accounting policies applicable to a going concern. This basis presumes that funds will be available to finance future operations and that the realisation of assets and settlement of liabilities, contingent obligations and commitments will occur in the ordinary course of business.

Events after the reporting period

The trustees are not aware of any matter or circumstance arising since the end of the financial year.

Trustees

The trustees of the trust during the year and to the date of this report are as follows

Name	Nationality
Prof J.D. Volmink	South African
Dr S.D. Bhikha	South African
Mr S.G. Mncube	South African
Mr G.M. Ntombela	South African
Prof R. Vithal	South African
Dr B.H. Khuzwayo	South African

Auditors

Apex Chartered Accounts Inc will continue in office for the next financial period.

5.3 FINANCIAL STATEMENTS 2013

Statement of Financial Position

	2013	2012
Assets		
Non-Current Assets		
Property, plant and equipment	4,492,924	2,705,447
Investment	1,175,939	-
	5,668,863	2,705,447
Current Assets		
Cash and cash equivalents	823,655	4,292,105
	856,655	4,292,105
Total Assets	6,525,518	4,292,105
Equity and Liabilities		
Equity		
Reserves	1,175,939	-
Accumulated surplus	4,772,940	6,681,692
	5,948,879	6,681,692
Liabilities		
Non-Current Liabilities		
Finance lease obligation	-	30,216
Current Liabilities		
Trade and other payables	328,700	26,925
Provisions	247,939	258,719
	576,639	285,644
Total Liabilities	575,639	315,860
Total Equity and Liabilities	6,525,518	6,997,552

Statement of Comprehensive Income

	2013	2012
Project Income	5,534,347	8,874,362
Other Income	79,695	350,241
Operating Expenses	(7,521,653)	(7,846,907)
Operating (deficit) surplus	(1,907,611)	1,377,696
Finance costs	(1,141)	(4,135)
(Deficit) surplus for the year	(1,908,752)	1,373,561
Other comprehensive income	-	-
Total comprehensive (loss) income	(1,908,752)	1,373,561

Statement of Cash Flows

	2013	2012
<u>Cash flows from operating activities</u>		
Cash receipts	5,579,492	9,091,567
Cash paid to suppliers and employees	(7,015,035)	(7,647,612)
Cash (used in) generated from operations	(1,435,543)	1,443,955
Finance costs	(1,141)	(4,135)
Net cash from operating activities	(1,436,684)	1,439,820
<u>Cash flows from investing activities</u>		
Purchase of property, plant and equipment	(1,968,550)	(2,665,473)
<u>Cash flows from financing activities</u>		
Movement in finance lease obligation	(30,216)	(23,441)
Movement in loans to directors, managers and employees	(33,000)	-
Net cash from financial activities	(63,216)	-
Total cash movement for the year	(3,468,450)	(1,249,094)
Cash at the beginning of the year	4,292,105	5,541,199
Total cash at the end of the year	823,655	4,292,105

Detailed financial statements including notes and reconciliation of property, plant and equipment, project income and detailed expenditure are available on request.

6. FUNDERS AND PARTNERS

We wish to take this opportunity to express our appreciation to our funders and partners, those who have supported us in the past, those who continue to do so year after year, and new partners that have joined CASME in the past year. All have been central to helping CASME achieve its mission to improve the quality of mathematics and science teaching and learning since it was established in 1985.

BHP Billiton
Sugar Industries Trust for Education
Toyota Teach
Michael and Susan Dell Foundation and BankSETA in
partnership with The Zenex Foundation
Mahle Behr South Africa
Smiths Manufacturing
Soul of Africa Trust
SAPREF
Transnet Foundation
MySchool Foundation
RISO Africa
Price Waterhouse Coopers
ETDP SETA

CASME also acknowledged the ongoing working partnership with



Department of Basic Education and the University of KwaZulu-Natal

