

Supporting African Maths Initiatives

(A company limited by guarantee)

Report and Financial Statements for the year ended 28th February 2023

Charity number 1161994

Company number 9458921

Supporting African Maths Initiatives - Report of the Management Committee for the year ended 28th February 2023

The Management Committee presents their report and the financial statements for the period ended 28th February 2023 and confirm they comply with the requirements of the Charities Act 2011 and the Charities SORP (FRS 102).

Reference and Administration Information

Charity name: Supporting African Maths Initiatives

Charity registration number: 1161994

Company registration number: 9458921

Registered address: Haydown Great Buckland, Luddesdown, Gravesend, Kent, England,
DA13 0XF

Management Committee

Executive Directors

Mrs Emily Fleming (Chair)

Mr Jeff Goodman

Mr Chris Clarke

Non Executive Directors

Dr Franca Hoffmann

Prof Balázs Szendrői

Dr Georg Osang

Dr Danilo Lewanski

Other members

Alexandra Gessner

Amy Fletcher

Anda Chisster

Andrew Harris

Artur Donaldson

Benjamin Walker

Danny Parsons

David Stern

Esmee te Winkel

Filippo Mancini

Gabriel Diaz-Aylwin

Giacomo Bighin

Gianmarco Bet

Giovanna De Giusti

Iordan Ganev

James Robson

Joanna De Silva

Kelly Pickerill

Lily Clements

Livia Mitson

Marc Jeannin

Marta Maggioni

Matteo Levi

Matteo Parisi

Michal Rolinek

Michela De Giusti

Monica Mancini

Nicos Starreveld

Oliver Dann

Pafue Christy Nganjimi

Peter Hull

Rachel Knott

Rafael Sanchez

Rose Teague

Santiago Maria Borio

Peñaloza

Sharad Keshari

Tom Denton

Chair's report

In 2022-2023, SAMI made significant strides in its initiatives and outreach.

Live Maths Camps were once again successfully conducted, engaging and inspiring students in Kenya, Ghana, Rwanda, and Togo. We were able to reprint and distribute more of our popular playing cards thanks to the generous support from the Swiss National Science Foundation.

Other activities included Uganda School Visits, the Maths Ambassadors Program and participation in the Cross Pollination Conference were among the diverse efforts aimed at improving the quality of mathematics education at all levels across Africa.

Collaborating closely with AMI, SAMI excelled in implementing technology-driven educational programs, fostering maths clubs, and contributing to the enhancement of classroom environments through the Happy Classrooms project.

Much gratitude goes to Sam Hyatt-Twynam, Danilo Lewanski, Marc Jeannin, Etienne Royer-Gray, and Hjalti Rögnvaldsson, whose dedicated efforts significantly contributed to our fundraising endeavors.

SAMI remains committed to advancing mathematics education, positively impacting the learning experience for students across the African continent.

Emily Fleming

Chair

24th November 2023

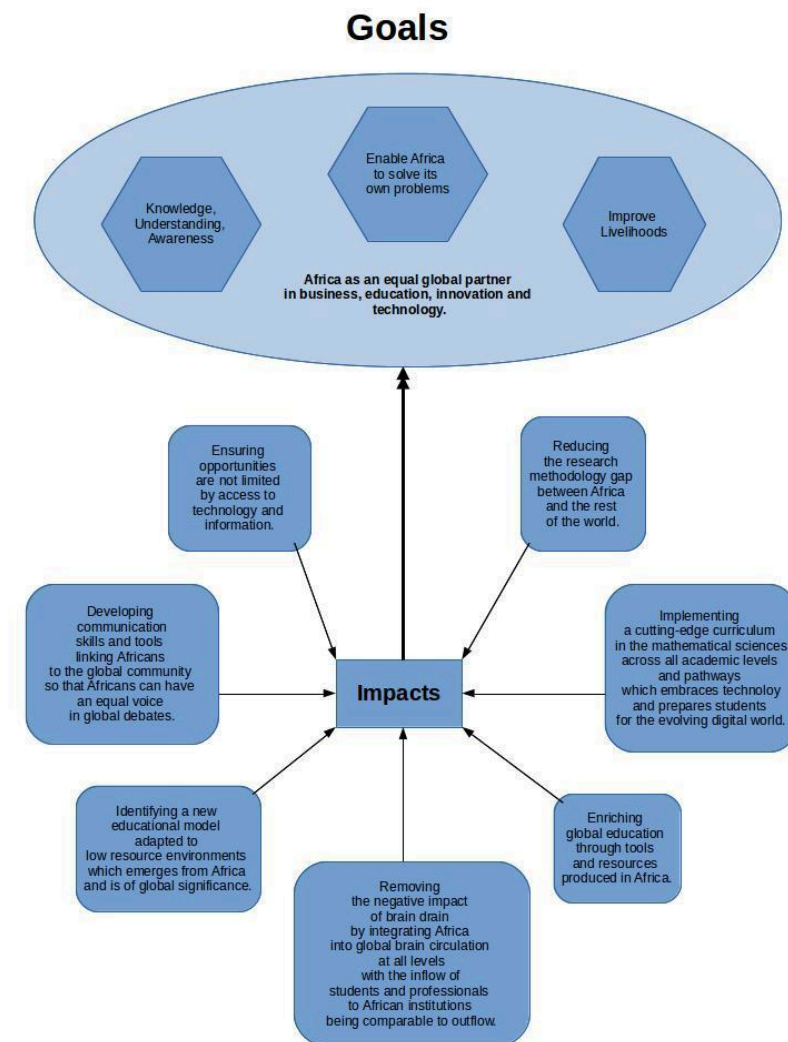
Aims and Objectives

Our charity's objectives as set out in the company's memorandum of association are:

To advance education in mathematics for the public benefit, in particular but not exclusively by

- a) supporting initiatives that promote mathematics and improve the standard of mathematics education in Africa through the provision of advice, funding, consultancy services and volunteers designed to support such initiatives;
- b) carrying out research into the effectiveness of new teaching and learning initiatives in mathematics, the useful results of which will be disseminated for public benefit.

Our aims as a charity can be summarised by the following infographic:



Updates from Initiatives

Virtual Maths Camps (VMC)

Maths Camps were back to being fully in person throughout 2022/2023 so after this report, we will renaming this pot of money Maths Camps as the goals are the same.

[Kenya Kongoni Community Library, Likuyani, Kenya](#)

28th March - 1st April 2022

Camp Theme: Inspire champions and ambassadors of Math Games

The camp targeted potential envoys of maths games, intended to motivate learners of various ages, backgrounds, communities, and mathematics abilities to participate in activities together and actively remove barriers to participation or in the built environment with a goal of fostering practices that demonstrate that anyone can do science by creating an enriched environment in which many approaches promote learning and participation. There were 55 students aged between 15 and 19, all from 16 high schools across Kenya. 30 of the participants were female while their male counterparts were 25. 10 local volunteers, 5 international volunteers, and 3 secondary school teachers were present as well.

This was the first ever camp to incorporate traditional AMI Maths camp themes infused with key messages and components from the Maths Games Ambassadors Project. Eight mathematical themes were facilitated at the camp. Other extracurricular activities included treasure hunt, board games and baseball.

[2022 Allotey Maths Camp \(Ghana\)](#)

18th – 30th July, 2022

The Allotey Maths Camp was held at the AIMS Ghana Campus and involved 28 participants from various regions and 9 volunteers.

The camp has a great impact on the participants with some highlighting that the Maths Camp had exposed them to their career goals and the diverse ways of solving problems

[Rwanda Maths Camps](#)

6th – 21st August

SAMI funded two experienced SAMI interns from Kenya to help run the camp in Rwanda alongside 4 recruited SAMI volunteers. In fact, they ran three parallel camps in different locations! With local support offered by AIMS Rwanda and their teacher training program, the planning week saw the organisation of three simultaneously run camps. Themes for the camp included mathematical thinking, programming and robotics, data science, modelling and cryptography.

Each camp had between 30 and 40 student participants representing over 40 high schools from across the country. The collaboration was a huge success with plans already underway for expanding the program to more regions throughout Rwanda. With local teachers on board, there is great scope for outreach and sustainability.

[Togo 2022 - Tsévié and Vogan](#)

24th - 26th August, 2022

The fourth Togo maths camp took place across two towns with a total of 65 students. It was a real success. While 8 participants were camped during the three days, the remaining were coming from their respective houses. On both sites, the participants were amazed by the activities and the level of critical thinking the activities required despite the simple nature of the questions.

[Kenya Math Camp Report 2022](#)

12th December - 16th December 2022

Kongoni Community Library, Likuyani Constituency, Kenya.

The Kenya Maths Camp in December brought together 7 international volunteers and 7 local volunteers, who spent a week in preparation brainstorming new approaches to help students experience mathematics as an interesting, fun, and engaging subject. The goal was to make the students believe they are capable of learning anything. Teachers had the

opportunity to grow professionally and learn new teaching techniques throughout the week-long preparation.

52 students joined the camp from 29 different schools around Kenya. The students were aged between 14 and 19 years with 73% of the students being female. This camp presented a bigger perspective on how to inspire the students to be aware of, understand, believe in, and be intrinsically motivated to learn through play and enjoy thinking in inclusive activities that revolve around 6 themes. The themes included programming and robotics, modelling, mathematical thinking, data science, games and puzzles.

[Kenya Math Camp January 2023](#)

16th - 20th January 2023

The aim of the Kenya Maths Camp 2023 hosted at the Akili STEMarts Academy in Kisumu was to present exciting themes to students on problem solving that will allow them to integrate the concepts into practice and inspire them to pursue careers in STEM subjects. Teachers and volunteers met for a week to prepare and were trained as Maths game envoys with excitement to support everyone in engaging in thinking through inclusive, fun activities. The students were introduced to different themes through activities and experiences and learnt skills in computational thinking, logical thinking, critical thinking, and mathematical thinking that are useful to address the central theme in problem solving. The Camp brought together 37 students from 18 secondary schools around the country. The students were taken through seven themes that integrated technological use in collaborative activities where everyone—including the accompanying teachers—learned through fun activities. The themes included mathematical thinking, data science, programming and robotics, physical activity, treasure hunt, modeling, and games and puzzles.

After a lengthy break, the students will return to class to support others in learning and using the resources provided as ambassadors for math games and to run math clubs employing the activities from the VMC card decks.

Playing Cards

SAMI created a Virtual Maths Camp card deck during 2020. Each of the 54 cards in the deck features a unique mathematical activity, engaging students in games, puzzles or fun mathematical facts. A leaflet gives hints and answers, whereas a QR code leads from each card to a website that contains extensions and references. A chatbot function is also available to check solutions.

The cards have now been used in numerous camps and maths clubs.

Following the success of the playing cards, a new print run was needed. In the summer of 2022 a reprint of the playing cards was required. This was organised by Balázs Szendrői and funding was found by Danilo Lewanski through his Swiss National Science Foundation for 4000 packs.

In July 2022 the cards were used by Dr James Munro at Oxford University for a [live online session](#) of Oxford Online Maths Club.

Maths Ambassadors program

One of the big things that was developed with the cards and started in February/March of this year was the Maths Games Youth Envoys program. The idea is that young people are trained to be able to deliver mathematical sessions using our deck of cards. The training focuses on four key concepts - Learn to play, play to learn; Problem Solving, Storytelling and Gamification; Activity Selection. The training lasts for two days and envoys receive a deck of cards, a certificate and a handbook (attached). This is Level 1 and prepares Envoys for facilitating sessions with their friends, peers and family. The next levels will go all the way up to being able to train Envoys themselves. The Maths Games Youth Envoys booklet can be found in the [resources section](#) of our website. SAMI intern Owen wrote a [blog](#) on his experience of the first training.

Uganda School Visits 2022

SAMI has collaborated with EANWoBAS (Eastern African Network for Women in Basic Sciences) to organise visits to schools in two regions of the country namely the eastern region which covers districts of Tororo, Bukedea, Pallsa and Mbale and the Northern region which includes districts of Gulu, Lira, Kiryandongo and Kitgumu. These districts perform poorly in basic sciences and also their representation in the universities in basic sciences is poor. EANWoBAS organised meetings with students, teachers, stakeholder, parents/guardians to showcase to them that girls can do well in basic sciences. Much of the funding for this project was from Danilo Lewanski via is Swiss National Science Foundation grant.

Cross Pollination Conference

26th - 30th of March

Franca Hoffmann, Danilo Lewanski, Heroine Otieno and David Stern organised a 4-day conference in Rwanda bringing together 18 Maths Educators from over 10 countries. Representatives from our partners in Rwanda, Ethiopia, Kenya, Togo, Ghana and Uganda attended. Workshops included sharing best practice and planning for the summer Maths Camps. SAMI funds were used to support the attendance of conference delegates as well as contributing to the running of the event.

R-Instat Code Sprint

Roger Stern and Zach Mbasu organised an R-Instat "code sprint" from 6th -10th of February 2023 in Maseno and SAMI funded this through the AIMS Cameroon Honorarium funds. The sprint was arranged to fit in with visitors to Kenya from Cameroon and Ghana and was a great success in preparing for an upgrade to the software at the end of February.

Supporting AMI work

SAMI has again worked closely this year with the Kenyan NGO African Maths Initiatives (AMI), and the Kenyan company Innodems. Zach Mbasu continues to play a pivotal role in the liaisons between AMI, Innodems and SAMI. We greatly value his leadership when partnering on projects with Innodems and AMI.

Zach carried out the interview process to find two new interns for this year - Owen Mulinya Kizito and Lucian Talu Mayabi. They have been fantastic additions to the team. In the first couple of months they both enjoyed facilitating maths camps and learning themselves on the Maths Envoy program and were very grateful for all the new experiences. Weekly meetings with Emily Fleming has helped them to learn to use Geogebra and Python and has helped with session planning for maths clubs and camps. They quickly became very valuable members of the team, engaging in all of AMI's work.

The funding for Owen Mulinya Kizito and Lucian Talu Mayabi came from Sam Hyatt-Twynam. We were able to keep Adinda Fleria Akumu thanks to Danilo Lewanski via his Swiss National Science Foundation grant. Financial support for AMI team member Juma Zevick Otieno to develop STACK resources has come from Lars Foundation. We are so grateful to all these donors.

Sam Hyatt-Twynam's donation was also used to fund a visit by SAMI director Emily Fleming to check on the projects being carried out for SAMI. Emily Fleming visited two maths clubs, six happy classrooms and helped run a mini-maths camp at Kongoni library. She was incredibly impressed by the team and the work they are doing.

The whole AMI team have had a very busy year running maths camps as well as the initiatives detailed below which come under the broad heading of "Enhancing Maths Education in Primary, Secondary and University Levels".

Maths Clubs

The AMI team are doing a fantastic job taking time to visit schools in rural areas and run maths club sessions for students and their teachers. They are inspiring schools to run maths clubs and are giving access to high quality resources that they are adding to all the time. Resources are adapted for students with special needs. The AMI team act as role models for students and are creating an excellent support network for teachers.

A new initiative this year has been to host intraschool math competitions within math clubs and in libraries and STEM centers. The AMI team has provided teacher training for question

selection, administration, and grading. They have started with offline competitions and will gradually introduce online ones to experienced schools.

STACK

SAMI has continued to support the development of online formative maths questions using software called STACK.

STACK has huge advantages over other online assessment systems as it was particularly defined for formative assessment and the questions are specifically written to detect common misconceptions and give automatic relevant feedback to students. Also, students can attempt quizzes multiple times with new variations of questions generated with each new try. Finally, STACK has the potential to ask open questions that help students develop higher-order skills, for example, questions where students have to create their own examples for specific situations.

STACK conference at Maseno University, 4th of July - 8th July

University lecturers in Kenya are overwhelmed with student numbers and a high quality online assessment system has huge potential to improve student and lecturer experience. In July SAMI contributed to a STACK conference bringing together lecturers from African Universities. The workshop aimed to provide lecturers with the tools they need to integrate automated formative assessment into their courses in the coming school year, raise awareness of STACK and its advantages, and provide them with the resources they need to implement STACK and build a community of educators dedicated to improving undergraduate mathematics education through open initiatives.

The usage of STACK in teaching and learning has benefited both students and lecturers in the school of mathematics by fostering a deeper comprehension of the material and greater engagement with it.

Consequently, lecturers that use STACK gain from the time saved on CAT marking, effective student feedback, and enhanced engagement using technology. The conference was a huge success and is planned to become an annual event.

SAMI's funding helped with accommodation for international and local volunteers and was matched by a contribution from IDEMS.

Happy Classrooms

Sam, Feleria, Talu and Owen spent a very busy six days in June visiting all the Happy Classrooms to engage with students and teachers in the complementary learning resources. This was picked up by a local news channel - the interview with Sam can be seen [here](#).

In advance of these visits SAMI helped the team to create 10 new model lessons for the Happy Classrooms.

We took advantage of the school holiday to paint 8 Happy Classrooms. The project works with schools to redesign and paint classrooms to make them brighter and more full of learning resources, as well as create model lessons to assist instructors in delivering engaging lessons and cultivating a love of learning in all students. A presentation of the project can be accessed [here](#).

Fundraising

SAMI is very appreciative of the many donations received this year.

Sam Hyatt-Twynam has donated £2,500 in this financial year. This huge donation brings his total contribution to £15,000 over the past four years. This money has been used to cover the stipends for 2 interns a year in Kenya and has therefore had a tremendous impact in projects such as Maths Clubs, Happy Classrooms, Maths Camps and STACK.

Danilo Lewanski has continued to use portions of his grant from the Swiss National Science Foundation for maths educational projects in Africa. This funding has meant that Danilo has been able to fund and extend projects instead of SAMI.

SAMI continues to be grateful to Marc Jeannin for his support with monthly donations.

Etienne Royer-Gray and Hjalti Rögnvaldsson smashed the London Marathon in October 2022, running on behalf of SAMI. Between them they raised £3,874 which is a huge achievement and a massive help for SAMI's summer Maths Camps - Hjalti's fundraising - and our year round projects from Etienne.

LARS Foundation

The LARS Foundation donated £10,000 for the second time to SAMI this year. We are so grateful for this huge donation and for the fact that there are no restrictions on this donation. It means we have been able to smoothly run many existing and new projects.

Structure, governance and management

Governing document

SAMI is a charitable company limited by guarantee, incorporated on the 25th of February 2015 and registered as a charity on the 3rd of June 2015.

The company was established under a Memorandum of Association by which it is governed in addition to its Articles of Association, dated 13th of May.

Appointment of Trustees

One-third of the trustees of SAMI stands down at the following year's AGM. Members and supporters of SAMI are written to in advance of the meeting to ask if anyone would like to be a trustee. New trustees are voted in at the AGM, and trustee positions may include previous trustees if there is no one else who would like to take over.

Organisation

The board of trustees, with a lot of help from other members, administers the charity. Trustees meet regularly throughout the year, and formally on at least three occasions.

Currently, all members are voting members.

Related parties and cooperation with other organisations

Before its incorporation, SAMI was set up after teachers helped at one of the maths camps in Kenya and wanted to extend the good work that was being done by AMI. AMI is a Kenyan

NGO that SAMI continues to work with very closely. SAMI and AMI collaborate together on activities and make payments on behalf of each other in the appropriate countries.

Financial Review

We don't have premises to run or any overheads, but we are committed to keeping a core set of projects running in Kenya and partner countries. At present, there is no separate reserve fund in place as our reserves are held as unrestricted funds. In line with our policy, we aim to ensure that the unrestricted funds do not fall below £2500.

Reserves can be allocated to charitable activities at the end of the financial year if the reserves are above the amount outlined. Reserves may only be used in exceptional circumstances if all executive directors agree.

This policy is reviewed on an annual basis at the time of our annual report.

Our policies require that requests for funding of projects come in writing and any expenditure must be approved by the Trustees. These requests are reviewed in line with our objectives, our current financial situation and our risk management policy. The Trustees assess the likely risks to which the charity is exposed, in particular including those related to the operations and finances of the charity, and are satisfied that systems are in place to mitigate our exposure to the major risks.

Statement of financial activities

Statement of financial activities (incorporating Income and Expenditure account)

For the period ended 28th February 2023.

Income

	Unrestricted funds (£)	Restricted funds (£)	Total 2023 (£)	Total 2022 (£)
Donations				
Personal fundraising and donations	2,790	1,750	4,540	2,160
Benevity donation	350	-	350	-
IDEMS	-	430	430	410
Virtual Maths Camp	-	-	-	1,750
Global giving foundation	-	-	-	180
Sam Hyatt-Twynam	-	2,500	2,500	-
Lars	10,000	-	10,000	-
Honorarium from AIMS Cameroon	-	-	-	1,512
Swiss National Science Foundation	-	4,280	4,280	-
Charitable activities				
Pi Day from 2020	-	-	-	50

Income continued

	Unrestricted funds (£)	Restricted funds (£)	Total 2023 (£)	Total 2022 (£)
Other trading activities				
Donations for used corks and cartridges	123	-	123	71
Using EasyFundraising online	57	-	57	234
Paypal Giving Fund	2	-	2	16
Amazon Smile	77	-	77	72
Total incoming resources	13,399	8,960	22,359	6,455

Expenditure

	Unrestricted funds (£)	Restricted funds (£)	Total 2023 (£)	Total 2022 (£)
Cost of generating funds				
Posting corks	-	-	-	6
Audit	-	-	-	600
Charitable activities				
Virtual Maths Camps (now Maths Camps)	2,586	2,500	5,086	3,808
Supporting AMI work	2,205	-	2,205	6,014
Happy Classrooms	-	1,534	1,534	1,747
Sam Hyatt-Twynam	-	2,793	2,793	1,843
Honorarium AIMS Cameroon	-	625	625	1,430

Expenditure continued

	Unrestricted funds (£)	Restricted funds (£)	Total 2023 (£)	Total 2022 (£)
Maths Club Togo	-	-	-	60
STACK workshop	425	430	855	-
Cross Pollination	751	-	751	-
SAMI Website	840	-	840	-
Jeff Snyder	-	1,740	1,740	2,000
Swiss National Science Foundation	-	4,280	4,280	-
Total expended resources	6,807	13,902	20,709	17,896

	Unrestricted funds (£)	Restricted funds (£)	Total 2023 (£)	Total 2022 (£)
Net income/expenditure and net movement in funds	6,592	-4,942	1,650	-11,441
Funds brought forward	8,254	16,743	24,997	36,438
Funds carried forward	14,846	11,801	26,647	24,997

Balance Sheet as of 28th February 2023

	Unrestricted funds (£)	Restricted funds (£)	Total funds 2023 (£)	Total funds 2022 (£)
Current assets:				
Debtors	-	4,710	4,710	-
Cash at bank and in hand	13,201	8,736	21,937	24,997
<i>Total current assets</i>	13,201	13,446	26,647	24,997
Creditors: Amounts falling due within one year	-	-	-	-
<i>Net current assets or liabilities</i>	13,201	13,446	26,647	24,997
Total net assets	13,201	13,446	26,647	24,997
Reserves				
Unrestricted funds			13,201	8,254
Restricted funds			13,446	16,743
			26,647	24,997

For the period ended 28 February 2023 the company was entitled to an exemption from the requirement to have an audit under the provisions of section 477 of the Companies Act 2006. No notice has been deposited with the company under section 476 of the Companies Act 2006 requiring an audit to be carried out.

The directors acknowledge their responsibility for:

- (i) ensuring the company keeps accounting records which comply with sections 386 and 387 of the Companies Act 2006; and
- (ii) preparing financial statements which give a true and fair view of the state of affairs of the company as at the end of the financial year, and of its surplus or deficit for that financial year in accordance with the requirements of sections 394 and 395 of the Companies Act 2006.

These accounts have been prepared in accordance with the provisions applicable to charitable companies subject to the small companies regime within Part 15 of the Companies Act 2006 and the Financial Reporting Standard for Smaller Entities (effective January 2019).

Approved and authorised for issue by the Directors on 24th of November and signed on their behalf by:

Signed:

Name: Emily Fleming (director)

Signed:

Name: Jeff Goodman (director)

Notes to the Accounts

For the period ended 28 February 2023

1. Accounting policies

Basis of Accounting

The charitable company is a public benefit entity under *FRS 102*. The financial statements have been prepared under the historical cost convention. They are in accordance with accepting accounting standards in the United Kingdom and comply with the provisions of The Charities Act 2011 and Reporting by Charities: Statement of Recommended Practice applicable to charities preparing their accounts in accordance with the Charities SORP (FRS 102).

Income Recognition

Donations and other income are accounted for when receivable by the charity. Investment income including bank interest is accounted for on an accrual basis.

Expenditure Recognition

The charity is not registered for VAT and accordingly expenditure is gross of irrecoverable VAT. Charitable expenditure comprises donations to beneficiaries and related administration costs. Donations to beneficiaries are recognised when a constructive obligation arises that result in the payment being unavoidable. Governance costs include those costs associated with meeting the constitutional and statutory requirements of the charity and include the costs linked to the strategic management of the charity.

Funds held by the charity are:

Unrestricted funds

These are the funds that can be used in accordance with the charitable objectives at the discretion of the directors.

Restricted funds

These can be funds that can only be used for particular restricted purposes within the objectives of the charity. Restrictions arise when specified by the donor or when funds are raised for particular restricted purposes.

2. Breakdown of expenditure on Charitable Activities

Expenditure (Unrestricted)	Supporting AMI work (£)	(Virtual) Maths Camps (£)	STACK workshop (£)	Cross Pollination (£)	SAMI Website (£)	Total (£)
Costs directly allocated to Charitable activities						
Stipends	1,066	-	-	-	-	1,066
Internet	475	-	-	-	-	475
Technology	651	-	-	-	840	1,491
Travel	-	1,229	-	737	-	1,966
Food, accommodation, transport, equipment hire and resources for students and local teachers for a camp, maths club, workshop or "code sprint"	-	1,341	425	-	-	1,766
Support costs allocated to Charitable activities						
Foreign transfer bank fees	13	16	-	14	-	43
Total expended funds (unrestricted)	2,205	2,586	425	751	840	6,807

3. Breakdown of expenditure on Charitable Activities (continued)

Expenditure (Restricted)	Argus (Maths Camps) (£)	Happy Classroom s (£)	Sam Hyatt- Twyna m (£)	Honorarium AIMS Cameroon (£)	Jeff Snyde r (£)	Swiss National Science Foundati on (£)	IDEMS (£)	Total (£)
Costs directly allocated to Charitable activities								
Stipends			1,629		1,436	3,044		6,109
Travel for volunteers for maths camps and clubs			1,143		289			1,432
Food, accommodation, transport, equipment hire and resources for students and local teachers for a camp, maths club, workshop or "code sprint"	2,471			620		1208	430	4,729
Labour, transport and supplies for Happy Classrooms		1,518						1,518
Support costs allocated to Charitable activities								
Bank charges	29	16	21	5	15	28	-	114
Total expended funds (restricted)	2,500	1,534	2,793	625	1,740	4,280	430	13,902

3. Funds

	At 28 Feb 2022	Income	Expenditure	At 28 Feb 2023
Unrestricted funds				
General funds	<u>8,254</u>	<u>13,399</u>	<u>(6,807)</u>	<u>14,846</u>
Total unrestricted	<u>8,254</u>	<u>13,399</u>	<u>(6,807)</u>	<u>14,846</u>
Restricted funds				
Virtual Maths Camp	<u>3,963</u>	<u>1750</u>	<u>(0)</u>	<u>5,713</u>
Jeff Snyder	<u>1,740</u>	<u>0</u>	<u>(1,740)</u>	<u>0</u>
Sam Hyatt-Twynam	<u>3,465</u>	<u>2500</u>	<u>(2,793)</u>	<u>3,172</u>
Happy Classrooms	<u>1,534</u>	<u>0</u>	<u>(1,534)</u>	<u>0</u>
Honorarium from AIMS Cameroon	<u>3,541</u>	<u>0</u>	<u>(625)</u>	<u>2,916</u>
Argus	<u>2,500</u>	<u>0</u>	<u>(2,500)</u>	<u>0</u>
Swiss National Science Foundation	<u>0</u>	<u>4,280</u>	<u>(4,280)</u>	<u>0</u>
IDEMS	<u>0</u>	<u>430</u>	<u>(430)</u>	<u>0</u>
Total restricted	<u>16,743</u>	<u>8,960</u>	<u>(13,902)</u>	<u>11,801</u>
Total funds	<u>£24,997</u>	<u>£22,359</u>	<u>£(20,709)</u>	<u>£26,647</u>

Details of restricted funds

Virtual Maths Camps

Funds raised to continue to provide a maths camp experience for students, teachers, and facilitators from across the globe - in a new, dynamic, partially virtual and fully international environment. Now able to be used in person thanks to restrictions being lifted on travel.

Jeff Snyder

Jeff Snyder kindly chose SAMI to receive a grant through his company PDT Partners.

Sam Hyatt-Twynam

Donation received to improve maths education in Kenya through teachers.

Happy Classrooms

Funds raised to paint classrooms and train teachers to use the new resources.

Honorarium from AIMS Cameroon

Funds donated by Roger Stern and Danny Parsons to fund activities such as workshops, courses and conferences

Swiss National Science Foundation

Grant run by Danilo Lewanski

4. Trustee Remuneration

None of the directors (trustees) received remuneration or expenses during the period.

5. Average Number of Employees

The average number of employees during the year was Nil (2020 – Nil)

6. Related Party Disclosures

There have been no transactions with related parties in the year to 28 February 2023.

7. Debtors

The £4,710 is made up of £4280 from Swiss National Science Foundation and £430 from IDEMS. This money has been spent in advance by SAMI and will be reimbursed.

Appendix 1

Explanation of keywords and phrases used in the infographic

- All academic levels – primary school all the way up to PhD and beyond. If activities are not designed with the scope of creating PhD holders then whatever change is attempted lower down (e.g. primary schools) could be undermined by people with higher qualifications but less knowledge.
- All pathways – maths for mathematicians, maths for scientists, maths literacy, vocational, other professions and walks of life. This is very important as a concept because most people specialise, but particularly in the African context, it is important and constructive to see this as a whole. We won't be constrained by thinking about one particular strain, we can turn this into an advantage and perhaps Africa can become an equal partner by taking on some of these bigger-picture solutions because everyone else is looking at a smaller level.
- Brain drain – The intellectual elite are integrating and migrating into the global system due to better pay and employment opportunities, however in developing countries, the local system cannot afford to lose them. (In some small countries, losing individuals as a result of brain drain is a problem. For example, in the case of Madagascar, graduates did not want to return to their country as they would face academic isolation. Alternatively, when individuals do not leave this can result in people developing in isolation, which can also be problematic. In some instances brain drain can be beneficial, as those individuals who choose to return after going away share their knowledge and skills with the local population.)
- Brain circulation – There is a need to improve the system by improving the circulation of people into the system, there are opportunities for dynamic individuals.
- Low resource environment - aims to dispel the myth that low resource environment means no access to technology, problem solving, extra curricular. Many low resource environments have time in abundance to do extra activities. Thinking about Kenya and South Africa, there are large chunks of the school day where pupils are waiting or simply having their time filled without much of an educational purpose. There is no way to create enough good skilled teachers to have a good teacher to pupil ratio. That is the essence of a low resource environment. But this lends itself to technology based approaches. At some stage the technology will need to be a tool to help pupil based learning activities. Modern day technology can now provide feedback which is the revelation. A myth of low resource environment is

that there is no funding. But actually governments do invest in education, but often the money is not spent wisely. The maths camp in Maseno in 2014 broke even on local funds. Another myth is that extra-curricular is a luxury, but it is actually easy and does exist in Africa.

- Educational model - The concepts, ideals and values behind the educational system. A model that has the values of formative assessment and feedback. An educational model encompasses concepts, the what and the why, the role of school, the aim of education, the teacher-student role. The educational model stands for the concepts without the implementation. Research methodology gap - The research methods used throughout Africa for most areas of research from universities to professionals are the same methods as were used in the 1960s. Now we have big data and large data sets. People in e.g. Agriculture and medicine, are taught statistics as a service subject. Tools they are taught and the tools that are available are from the 1960s. There has been an explosion in tools and data that are available. These make the research much easier. The tools used by global research are growing exponentially. The gap in terms of the methodologies used has been getting worse and worse. Difficult to overstate the size of this problem. Pretty much all the money spent on agricultural research in Africa is wasted due to this problem.

Appendix 2

Underlying Dimensions: Situational constraints and choices

Before considering how we hope to move towards the high level outcomes via a lower tier of activities, outputs and outcomes it is important to discuss some of the dimensions that may constrain or guide us. We will start by discussing those we view as imposed by choosing to work in an African context and can be chosen to be seen from positive or negative perspectives.

Young/Old Demographic

Africa has the world's youngest population which could be its greatest asset or greatest threat. For example, we could not begin to think that in the future there will be anywhere near enough highly trained and skilled teachers to teach all of Africa's youth, and therefore we cannot consider anything that would depend on this fact.

Individuals/Institutions

Individuals have large amounts of responsibility and influence. They can really make a difference. This has some clear negative connotations when considering issues such as corruption, however this can also be turned into a strength given the ability for these individuals to provide information and communicate between a much wider target audience. An example might be the importance of formative feedback being pushed within school and university contexts by the same small groups of individuals who have a great deal of influence within both contexts.

Demand/Supply-Driven Change

Change is driven by demand. There is potential for large-scale systematic reforms.

Low/High Resource Environments

Working in low resource environments is challenging, but has the potential to impact universally.

One might argue that the diversity of Africa does indeed provide a number of high resource environments (strong-performing private schools for example, akin to many of those in Western countries), however we could not possibly feel justified focusing within this specific domain and claiming it representative of wider Africa. It is clear by example that if you were to create a set of resources that helped young children fundamentally grasp concepts through 1:1 student-teacher interactions, this model could not then be transferred into a situation where the ratio may in fact be 1:50. If however we take the converse and find

something that works within a 1:50 environment then it will hold many of the same benefits when implemented back in our initial high resource environment.

Whilst the previous dimensional *choices* are already made through the decision to work within the wider African context, there are still numerous further dimensions where choices have to be made. We have identified the following 4 pairs as significant for what we want to achieve:

Top-down *Bottom up*

Adaptive *Disruptive*

Formal *Informal*

Content *Implementation*

These dimensions all have the ability to drastically change the appearance and nature of an initiative. If we were to just take 2 we could represent such choices and outcomes by the following diagram:

	<i>Adaptive</i>	<i>Disruptive</i>
<i>Formal</i>	Improving current school curricula to include problem solving	Completely replacing current school curricula to take a different approach
<i>Informal</i>	Build on existing community literacy programs	Create a new set of microworlds that enable education to become a core component of daily life

We would assert that when considering how to move in the direction of our proposed outcomes, it is important to consider how it is possible to provide progress across all dimensions in which we have choices; from grassroots initiatives to government-backed schemes, building on work which has already been done, as well as bringing in completely fresh and new ideas, influencing within defined instructional institutions as well as

anywhere else learning can take place. We could see how these different approaches could all potentially add value and move towards a specific long term outcome.

Appendix 3

Key values

- **Sustainability:** From its inception, the first maths camp - the Maseno Maths Camp - was an initiative instigated and supported by lecturers at Maseno University as a locally sustainable initiative. All camps are not-for-profit ventures, with local and international educators volunteering their time freely. In 2014, the Maseno Maths Camp was able to run with all local expenses covered by student registration fees. Full fees for the week including accommodation and food are 5000 Kenyan Shillings (around \$60) with a large number of local students paying reduced fees. There is a similar scenario in the Ghana maths camp, and in Ethiopia the students are funded from the university budget. Volunteers at the camps include a mix of local and international mathematics students, teachers, educators, lecturers, academics, researchers, PhD students and mathematics enthusiasts, a mix designed to maintain engagement of participants whilst ensuring that the event does not rely on any given individual. Exceptional participants are encouraged to become volunteers and are mentored into a new role once they finish school.
- **Extra-curricular mathematics:** The camps are designed to open students' eyes to the world of mathematics and show that mathematics is not all about calculations. The aim is to introduce mathematics not found in a classroom, both through the choice of content and through the delivery of the subject material. Each camp focuses on five or six different "themes" in mathematics, such as modelling, combinatorics, programming, code breaking, statistics, non-Euclidean geometry and game theory. Whatever the theme, the focus is on understanding concepts and problem solving situations, very different from the calculation and formula emphasis students experience at school. Moreover, the organisers believe in making high level mathematics accessible to high school students. Even though the camps are not tailored to help students with the mathematics covered in the school curriculum, students often find that their achievements in mathematics improve on their return to school, and even see improvements in other subjects. The case studies of Cabrine and Evans, in our research paper for EDULEARN, illustrate this point even if they are exceptional rather than representative students.
- **Inclusive:** All high school students (aged roughly 14 to 18) are welcome to attend the camps. There are no entry requirements and the camps aim to have a mix of pupils with different socio-economic backgrounds and different achievements so far in maths. Equal numbers of boys and girls at the camps is a target, with a good mix every year so far, and there is a maximum number of students from any one individual school to ensure that a variety of schools are represented. Many students come from local public schools, but private and national schools are also represented. Students are not separated by any of these factors during sessions at

the camps and despite the wide range in ages, schools, backgrounds and mathematical ability of students who attend the camps, this has never caused an issue. The focus at the camps is not on the facts and formulas memorised in school but on critical thinking, creativity and being logical and persistent in solving puzzles and problems, so any student can succeed at the camp by applying themselves.

- **Everyone Learns:** The camp is set up to allow learning opportunities for everyone, not just the students attending. Local university student volunteers learn ideas applicable to their university maths clubs and get valuable new input to their studies. They meet and work alongside local and international lecturers, teachers and PhD students and integrate themselves into a wider professional network. Teachers who accompany their students are given a few separate sessions to discuss what they have observed and learned from the sessions, how they could take this back to their classrooms and how they can receive support from the organisers in doing so. In general, teachers attend the sessions together with the students and learn alongside them. Local and international teachers have the opportunity to interact with mathematics lecturers and researchers and learn new academic depth and background to the material they teach at school level. Local lecturers and teachers see a different style of teaching in action. Volunteers learn new branches of mathematics from being involved in a dynamic group with different specialisms. Mathematics researchers gain hands-on teaching experience alongside experienced teachers and receive feedback on their input. Thanks to this sharing of expertise across all levels the maths camps have been attracting enthusiastic and skilled volunteers consistently over the years, facilitating the smooth running of the camps.
- **Technology:** Technology plays a key role in the camps. Software such as Geogebra and Scratch are used to give students an opportunity to explore mathematics and programming in an interactive environment. Many students have not used a computer before; but rather than teach them how to use a computer, mathematical activities are designed which will allow them to learn how the computer works at the same time as doing the maths. Whenever possible free open source software is used and all the resources that the students are exposed to are given to them at the end of the week on a DVD.
- **Development of New Educational Material:** Each camp week is preceded by a preparation week where local and international organisers and volunteers get together to prepare the maths camp. This model has proven to be very successful given the challenge of organising such an event with facilitators being engaged in other full-time work both locally and abroad. The preparation week does not only serve as a training for local and international volunteers and as important team building in preparation for the camp week, allowing to share expertise, to learn new mathematics and to explore new teaching methods, it is also a valuable opportunity

to create new educational material. This is where new ideas and concepts are developed and tested with local and international partners working together on a tight deadline. Since 2011 a large number of resources have been created, both within and outside the preparation week, that are now more widely available. A secondary aim of the preparation week, in the last few years, has been to develop and improve the Maths Camp Starter Pack, a collection of mathematics resources that can be used by students, teachers, academics and interested individuals to run a similar event independently, be it for a half-day or a full week.

- Immersive environment: Students are immersed in mathematics throughout the whole week. The structure of the camp is designed to make time for physical activities and card games. Links between card games and mathematics are highlighted and physical activities are chosen carefully to involve teamwork, critical thinking and logic. It is a core belief of the camps that mathematics can be learnt through games. Students work in pairs and groups throughout the week to encourage mathematical discussion. There are puzzles of the day which students work on during their free time, and the computer labs are open outside formal sessions so that students are given the opportunity to explore the programmes they have been introduced to independently.
- Community: Students enjoy the opportunity to meet peers from other schools and to interact with local and international students, teachers, lecturers and researchers. Breakfasts, lunches and dinners are all taken together; these and other activities outside of lessons create a good working relationship between all camp participants. They help create an environment that breaks through the traditional hierarchies in educational institutions and gives mental space for critical thinking, allowing to challenge each other and learn from each other across all academic levels and backgrounds. A key value of the camps is that there are no barriers between students and facilitators, there are interactions between everyone and everyone has a voice. This sense of community builds with a few students returning year after year, in some cases even becoming volunteers after they leave school. Students are keen to share what they have learned on their return home, and almost universally state an enjoyment of mathematics when leaving the camp. This is a small but important step towards creating a community of individuals enthusiastic about mathematical ideas, and eager to embrace mathematical concepts in their future endeavours.