



Images: Harris Stewart / Banker's High School / Kirkcaldy

Annual report 2020

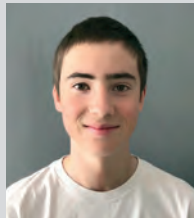


Image front cover: Harris Stewart from Balwearie High School in Kirkcaldy.

What Harris said about his image: “To create this front cover image for the SSERC Annual report I merged together photos of a barren landscape and a bustling city. The image symbolises that through the use of science, technology, engineering and mathematics, what was once empty land has turned into a bustling metropolis full of incredible architecture and machines all made possible through individuals’ perseverance in these four subjects.”

SSERC would like to acknowledge the support of Amazon Development Centre Scotland (Edinburgh) who kindly donated the £50 Amazon voucher that was presented to Harris – the winner of the competition to design the front cover of the 2020 SSERC Annual Report.

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Overview

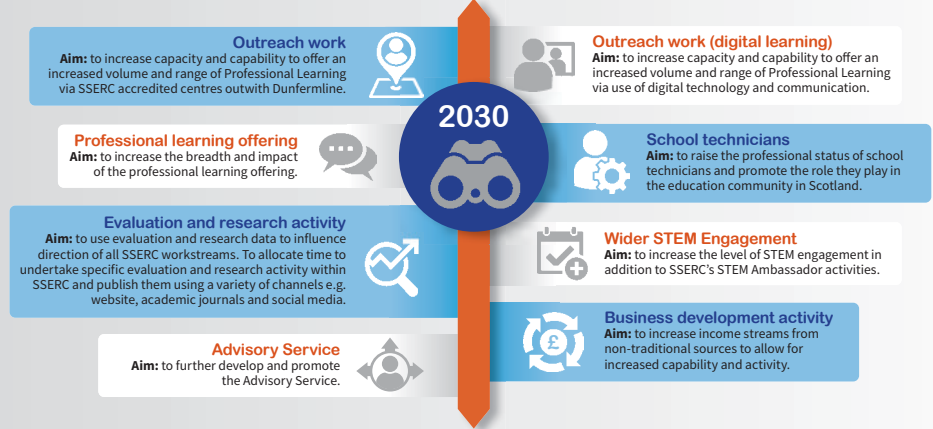
Message from the Chair

Last year I highlighted the significant progress that had been made by the organisation across the seven workstreams associated with Vision 2030. During financial year 2019/2020, the SSERC Board of Directors and Trustees added an eighth workstream, recognising the critical role that the organisation plays advising on and supporting health and safety in the STEM curriculum. I am pleased to report that SSERC has made significant progress across all eight workstreams, positioning itself as a key player within STEM education and training in Scotland – and beyond.



Central to this success has been the hard work, professionalism and enthusiasm of the SSERC team; further highlighted by the support that they continue to provide to the education community in Scotland during the current COVID-19 pandemic.

SSERC has always been associated with excellence in the professional learning support it provides to science teachers in Scotland; it is pleasing to see this reputation for excellence also recognised by design and technology and digital skills/computing science teachers and school technicians. The organisation's wider STEM engagement activities are relatively new but are having a significant impact across the STEM landscape in Scotland. The Scottish STEM Placement Programme; the STEM Ambassador Programme; the Young STEM leader Programme are all led by SSERC and provide testament to the high regard that the organisation is held not only in Scotland but also in the UK.



We continue to be grateful to all our funders and members; we would be unable to offer our current range of products and services if it were not for their ongoing support.

The financial year 2020/2021 will undoubtedly be a challenging year for the organisation post COVID-19; but already I can see signs of continued growth, development and diversification which bode well for the significant contribution that SSERC will continue to make to the STEM education community in Scotland and beyond in the year ahead.

Councillor Alan Nimmo - Chair of SSERC Board of Directors and Trustees



Message from the CEO

The COVID-19 pandemic that has had such a significant impact on society and business in 2020 is within the timeframe covered by this annual report. It would be wrong to give it undue prominence given that all within the STEM education community in Scotland rose to the challenge and found new and creative ways to continue to support each other. In this, I include the team at SSERC who all responded positively, and in different ways, to help the organisation and myself in what were difficult and uncertain times.

The financial year 2019/2020 was one in which we continued to deliver a broad and diverse range of products and services to the education community in Scotland; activities underpinned by our core values of innovation, integrity, passion, excellence and respect allowing us to further enhance our reputation for professionalism and quality.



After two years of significant organisational change, SSERC is now in an excellent position to respond to the many challenges that we all face within the STEM education and training community. Our Advisory Service will continue to provide a unique and specialist level of support to education practitioners, ensuring that practical work can continue within the STEM learning environment in a way that promotes a common-sense approach to health and safety. In early 2020 we commenced an 18-month programme to review, refresh and update our professional learning provision. Face to face, hands-on experiential learning will remain part of our core offering, but we will be complementing that with more localised delivery and significantly increased use of digital technology.

As we move into financial year 2020/2021, still under the restrictions resulting from COVID-19, the SSERC team will continue to provide support to the education community – albeit in a different way – and prepare for returning to normality where we can yet again demonstrate that we are the go-to organisation for STEM education support in Scotland.

A handwritten signature in blue ink that reads "Alastair MacGregor". The signature is written in a cursive style.

Alastair MacGregor - Chief Executive Officer at SSERC



SSERC functions

SSERC offers a unique portfolio of quality products and services to support STEM education in Scotland.

- 1 **Provision of Professional Learning** for childminders, early years practitioners, primary and secondary school teachers and school technicians.
- 2 **The Advisory Service** provides health and safety guidance for the Scottish education community to support safe STEM-based activities in the classroom environment.
- 3 **Wider STEM engagement activities** including lead for the STEM Ambassador programme in Scotland, teacher placements into industry and the Young STEM Leader programme.

Funders

We remain grateful to our external funders who continue to support the work of SSERC:

- The 32 Scottish Local Authorities (LAs)
- The Scottish Government
- Other member organisations
- STEM Learning
- The Primary Science Teaching Trust (PSTT)
- The Scottish Association for Metals
- The Edina Trust
- The Royal Society of Chemistry (RSC)
- The Institute of Physics (IOP)
- Biochemical Society
- Education Scotland
- General Teaching Council for Scotland (GTCS)

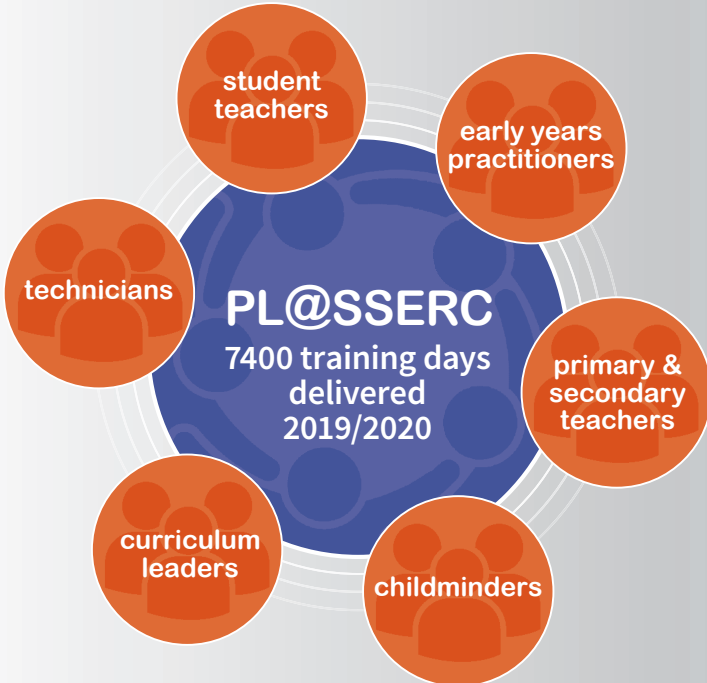
We are grateful to the GTCS for sponsoring the Scottish Universities Science School and to the Scottish Association for Metals for sponsoring the Scottish Universities Technology School.

Support for STEM education



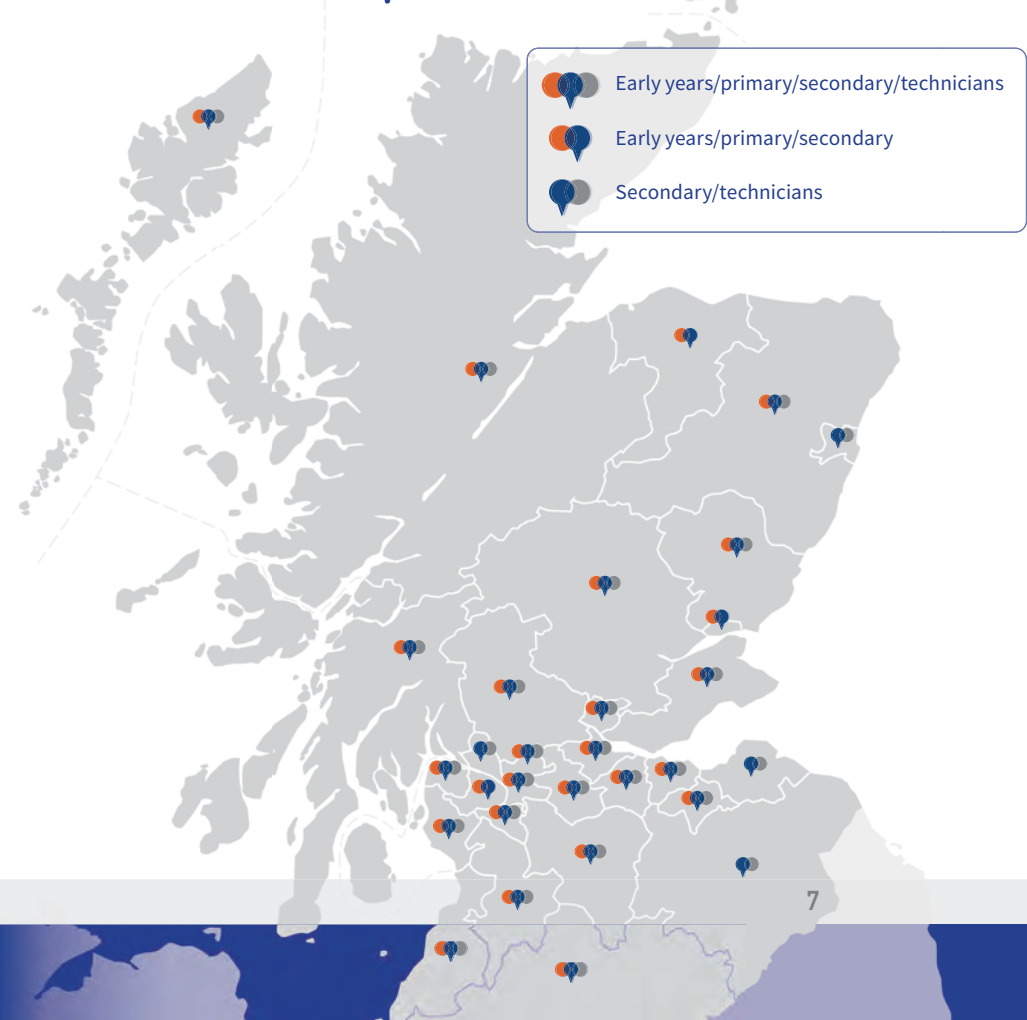
Professional Learning (PL)

During 2019/2020 we worked in partnership with a range of organisations including The Scottish Government, Education Scotland, STEM Learning, The Primary Science Teaching Trust and many others to deliver a programme of experiential professional learning. Our main area of activity continues to be in the STEM areas of the curriculum, including digital skills and computing science.



During 2019/2020 SSERC delivered **7400** STEM professional learning training days for practitioners from early level to senior phase – an **increase of 11%** from the previous year. Our reach was across all Scottish LAs.

Which LAs were represented?



Early years/primary sector

SSERC continues to offer a broad range of professional learning opportunities to all early years practitioners and primary teachers to enable quality STEM activities to be delivered in childminding settings, nurseries and primary schools across Scotland.

Models of delivery

Professional Learning Models used during academic year 2019/2020:

- Immersive residential events
- Day courses
- SSERC_Meets (remote learning opportunities)
- Primary/Secondary Transition days

Strands of delivery

Our provision of professional learning across early years and primary STEM is channelled through 3 main strands:

- The Primary Cluster Programme in STEM (PCP)
- SSERC_Meets
- Open courses

Reach

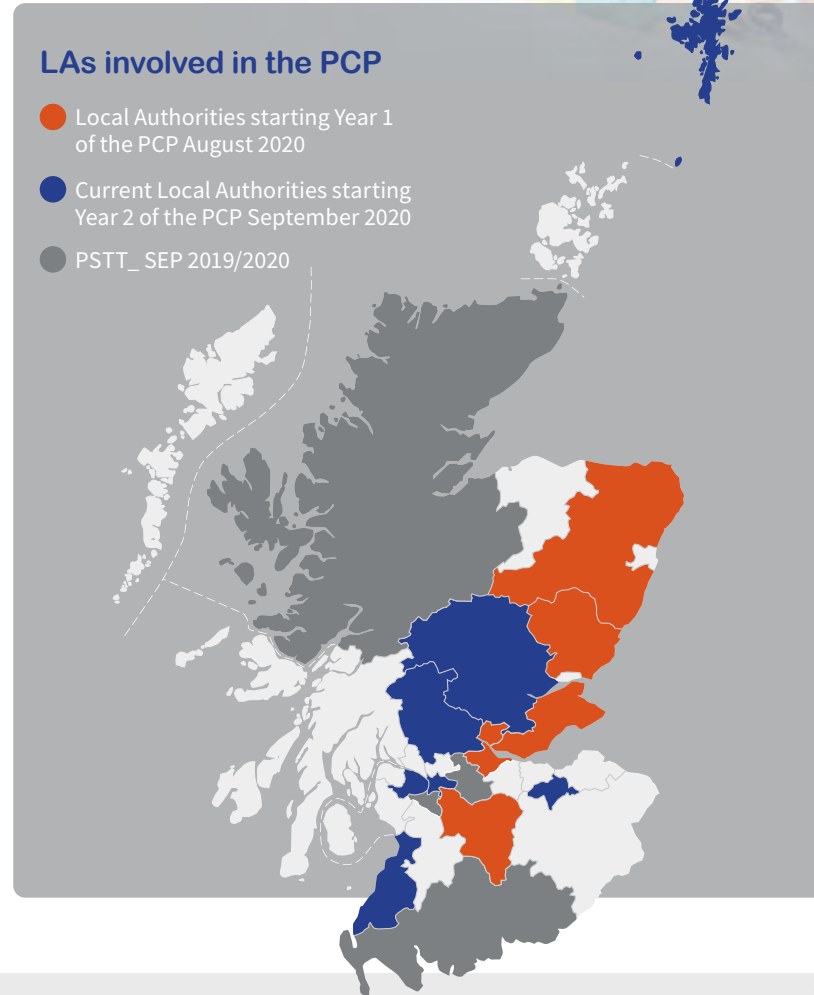
Across our programmes we delivered a total **3404** STEM professional learning training days (STEM PLTD) units of which **941** were delivered using SSERC_Meet technology with **2301** STEM PLTD delivered through the PCP during 2019/2020. Overall, across 28 Local Authorities teachers from **285** schools engaged in professional learning offered by SSERC.

Transition

During 2019/2020 a total of **12** secondary and **31** primary teachers attended events aimed at supporting effective Primary/Secondary transition programmes in clusters which have been part of the PCP. Attendees come to SSERC for a day of hands-on activities, based around practical ways of developing concepts, particularly across second, third and fourth levels of the Sciences Experiences and Outcomes. Overwhelmingly, the feedback from such events was positive. >>

LAs involved in the PCP

- Local Authorities starting Year 1 of the PCP August 2020
- Current Local Authorities starting Year 2 of the PCP September 2020
- PSTT_ SEP 2019/2020

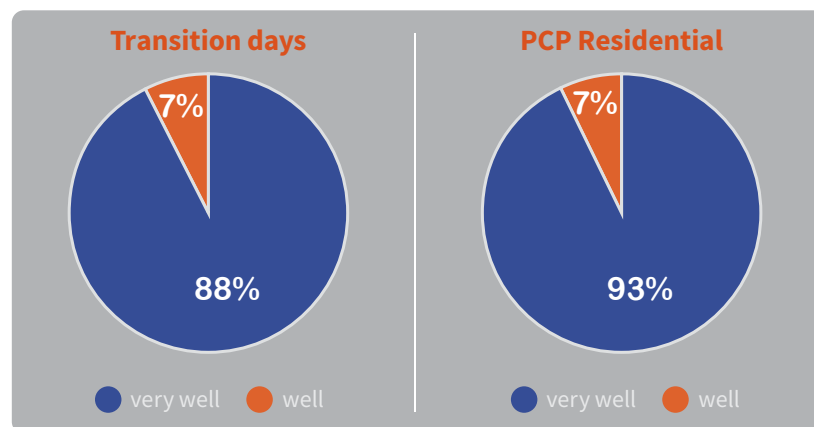


Primary Cluster Programme

The PCP is supported by funding from The Scottish Government, The Primary Science Teaching Trust (PSTT) and The Edina Trust. Clusters from within all **32** LAs have, to date, taken part in the PCP and The Scottish Government, PSTT and Edina Trust are committed to the PCP continuing through to April 2022. Over the **6** residential events held between May 2019 and February 2020, **78** teachers from **14** clusters across **7** LAs worked to raise their own levels of confidence and expertise and become mentors in STEM for their cluster colleagues with each providing PL and support to other colleagues within their LA.

In common with other SSERC professional learning programmes all aspects of the PCP are subject to internal evaluation on an on-going basis. At the end of Part 1 of the Residential we invite participants to reflect on the extent to which they feel the experience has prepared them for their future role as mentors across early years and primary provisions.

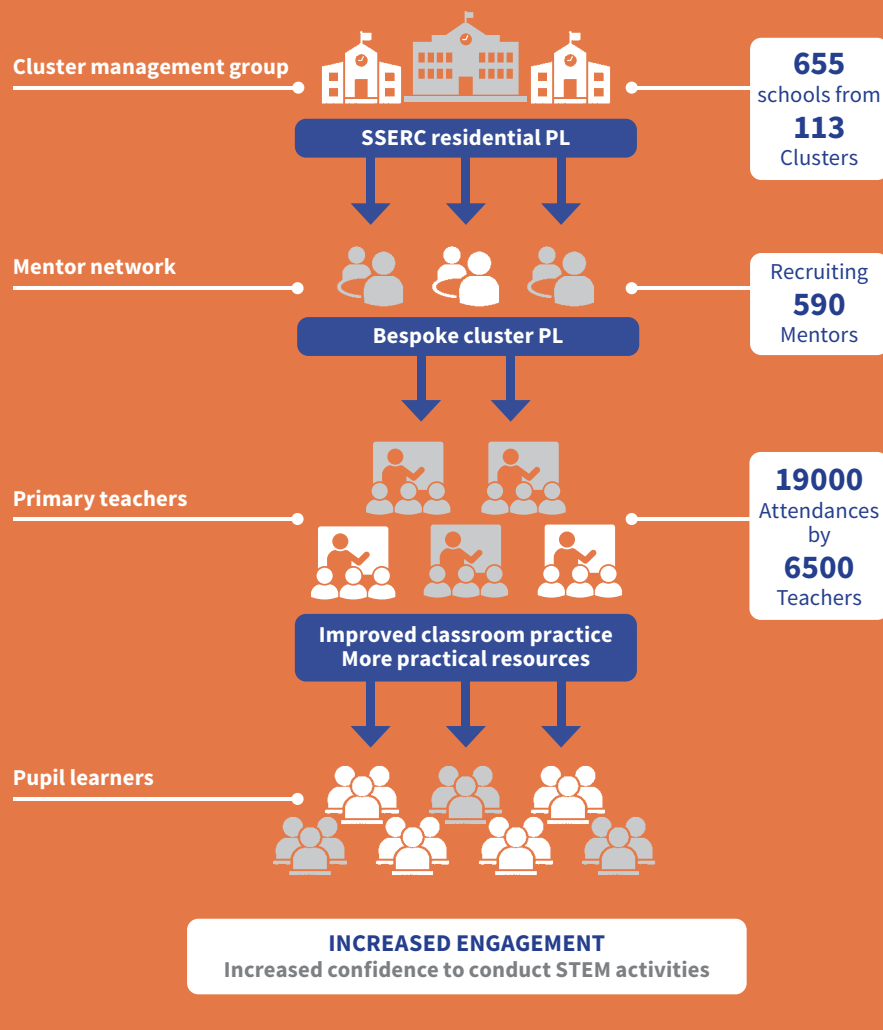
When asked the question 'To what extent did the course meet your expectations?' The response rate was 93% 'very well' and 7% 'well'.



"Great fun and easy to replicate great for both older and younger children."

How does the PCP work?

Numbers to date



PSTT - Sustain and Extend Programme (PSTT_SEP)

PSTT provides funds to support LAs to sustain and extend the impact of their participation in the PCP. The aim of PSTT_SEP is to allow LAs to further develop their mentor network in order that PL programmes for additional clusters are made available.

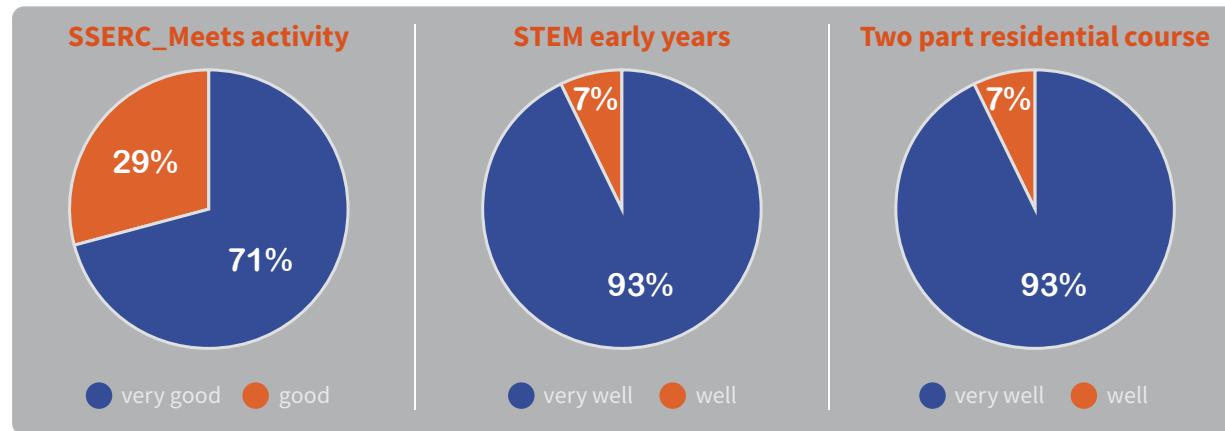
The aspiration is to ensure that LAs have a commitment to supporting the development of a sustainable and scalable STEM professional learning programme. The alignment of the PCP and PSTT_SEP allows for increased sustainability and impact.

“Amazing resources which we have been able to take back and use straight away.”

Open courses and SSERC_Meets

Our unique SSERC_Meets programmes (online professional learning in a ‘cook along’ format) continue to be popular with delegates. Six different SSERC_Meets were offered during 2019/2020:

- Light, shade and shadows
- Fun with forensics
- Further fun with forensics
- Pneumatics and hydraulics
- Teddy in the park
- Science inquiry



A total of **28%** of our early years and primary activity was delivered through SSERC_Meets during 2019/20.

The response to the question ‘Overall, how would you rate your experience of the course?’ was ‘very good’ 70.5% and ‘good’ 29%.

During the year we ran 7 STEM events with a specific focus on early years. A total of **98** Training Days were delivered.

When asked the question ‘To what extent did the course meet your expectations?’ The response rate was 93% ‘very well’ and 7% ‘well’.

Through our links with STEM Learning we are able to offer a 2-part residential course, funded by an ENTHUSE bursary.

During this course we asked the question ‘Overall, how would you rate your experience of the course?’ with 93% of respondents saying ‘very well’ and 7% saying ‘well’.

Due to COVID-19 we have had to reschedule part 2 of the residential course; however, all delegates have accepted the revised dates and we look forward to their return to SSERC in early 2021.





Reformatting and adaptations made to the PCP

Moving into the new academic year 2020/2021 we have been able to reassess and repurpose the PCP as well as all other PL opportunities. Rather than the PCP and SEP being 2 separate, yet complementary, programmes, we have developed a seamless and coherent 26 month programme that includes ongoing online support and guidance. The Edina Trust Science Resources for Schools (SRfS) grants will be used, in 2020/2021, to provide additional resources to support the SSERC_Meet elements of the PCP.

COVID-19 and the associated restrictions means that we have had to review our PL portfolio, especially those involving elements of face-to-face delivery. We will make increased use of online platforms with resources being sent out to mentors and staff in schools to allow engagement with our PL activities. The availability of resources in schools will further increase take-up in classrooms across the country.

In addition

Throughout the year we have also been involved in supporting numerous clusters across different LAs with delivery of STEM PL for staff, covering early through to second level experiences and outcomes, through the Education Scotland STEM grant awards. To date we have worked on bespoke programmes of professional learning for Shawlands cluster, Carmunnock Primary School, Ardeer Primary and Beanstalk Nursery.

“We have formed an excellent relationship with the key science players across the cluster and this has resulted from this SSERC programme.”

We have continued our working partnership with the Scottish Childminders Association (SCMA) and have developed a day of workshops to be delivered to their trainers and to be made available through bespoke e-learning modules late in 2020.

In June 2019 we were pleased to be able to partner with PSTT to support their International Primary Science Education Conference which was held in Edinburgh. This offered an outstanding professional development opportunity for primary schools teachers who have an interest in STEM. The programme included keynote talks, practical workshops, reflective seminars and a wealth of suggestions for hands on and exciting practical STEM activities.

Secondary sector

We are proud of the quality and range of SSERC professional learning opportunities available to teachers of STEM in the secondary sector.

The STEM Education and Training Strategy for Scotland emphasises that effective professional learning is vital in order to allow teachers and other practitioners to develop their STEM knowledge and skills [Scottish Government (2017)].

Range

Professional learning models used during 2019/2020

- Immersive residential events
- Day courses
- Online courses
- Blended learning
- Self-study courses
- Short face-to face 'twilight' sessions

Reach

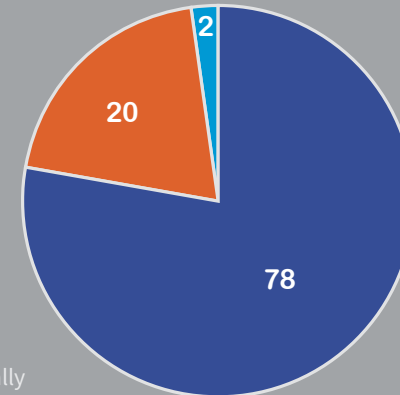
- Teachers from 81% of the secondary schools across all 32 Local Authorities
- Teachers from 33 independent secondary schools
- Lecturers from 7 colleges of further and higher education



3145
PL Training Days
were delivered in total

Quality

Across all our secondary courses for teachers, delegates reported on how well courses had met their expectations.



Very well Well Partially

"Amazing! Exactly the kind of info I spend hours looking for to enhance engagement and context of curriculum. More of this please!"

Impact

For every activity, in every course, every delegate was asked if activities would be used back in the classroom. Of some 3500 responses, 69% of delegates said 'Definitely'.

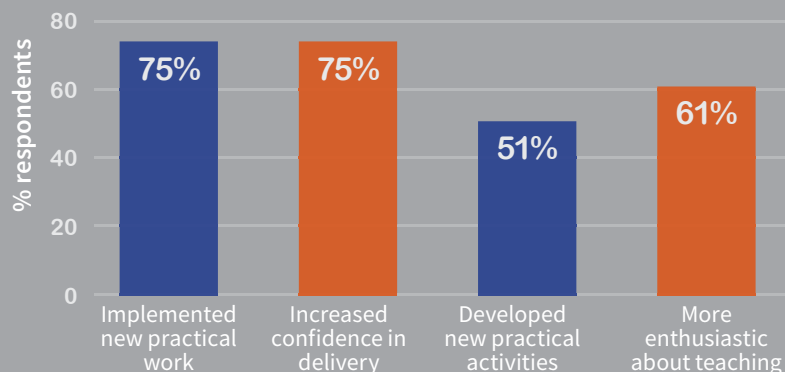


69%
of delegates would
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in the classroom



Reported changes in aspects of classroom practice

Teachers who attended our multi-part courses reported changes in aspects of their classroom practice.



How we supported early-stage-career teachers

Student teachers

The Scottish Universities Science School (SUSS) and the Scottish Universities Technology School (SUTS) are seen by our colleagues in the Initial Teacher Education Institutes as integral components of the educational landscape.

“What elevated this was being given the materials - this is the biggest barrier to applying CPD with cool new ideas, but here I can go and start applying some of these activities straight away which is brilliant.”

Probationer teachers

This course aims to provide delegates with opportunities to increase their levels of expertise in areas outwith their subject specialism. 97% reported that the course met their professional needs ‘very well’, or ‘well’.

Recently qualified teachers

Demonstrations for Recently Qualified Chemists was a new course in 2019/2020. All delegates indicated that, as a result, they have implemented new practicals and investigations in their teaching and that their pupils appear to be more enthusiastic.

Adapt and innovate

New courses 2019/2020

- Demonstrations for Recently Qualified Chemists
- Annual Teachers’ Meeting - joint with the Royal Society of Biology
- Assignments for Environmental Science
- Engineering Bench Skills for Probationers
- Welding Skills
- Hot and Cold Metal Forming
- Centre Lathe Turning

New models

Online self-study courses in Optical Radiation, and Radiation Protection.

Physics Blended Learning - a principal contributor to our digital offering. Having both online and face-to-face components it has successfully addressed some pressing issues for schools-cost, teacher release to attend professional learning events and whole department involvement. Adapting and building on the findings of earlier pilot courses, the 2019 course was very well received. The wider SSERC team will deploy similar models in future.

COVID-19 lockdown

With teachers in lockdown and access to SSERC HQ limited we had to quickly adapt Part 2 of our 2019/2020 Secondary Probationers’ course to a digital format.

“I would like to say a massive thank you to everyone at SSERC for organising this course to be done remotely.”

Technicians

At SSERC we recognise that the need for effective and relevant professional learning resides across the whole of Scotland, and that some areas may find it challenging to attend development opportunities that are not local. In April 2019 we launched the SSERC Accredited Centre programme allowing educational bodies, external to SSERC, to deliver SSERC Accredited professional learning programmes locally.

Working closely with these SSERC Accredited Centres, we have continued to provide competence-based training courses to support school technicians across 6 SSERC Accredited Centres.



2019 Technician Conference

The 2019 Technician Conference, took a different approach than in previous years, offering a wide variety of short training sessions ranging from Electrical Theory to Welding, as well as discussion and networking opportunities to a much wider audience. 50 technicians from across Scotland attended this event, and the evaluations were extremely positive.

New courses

As a result of two successful grant applications we have developed 2 new courses:

- Working with technology in Science: Data Logging.
- Working with technology in Technical: 3D Printing and Laser Cutting.

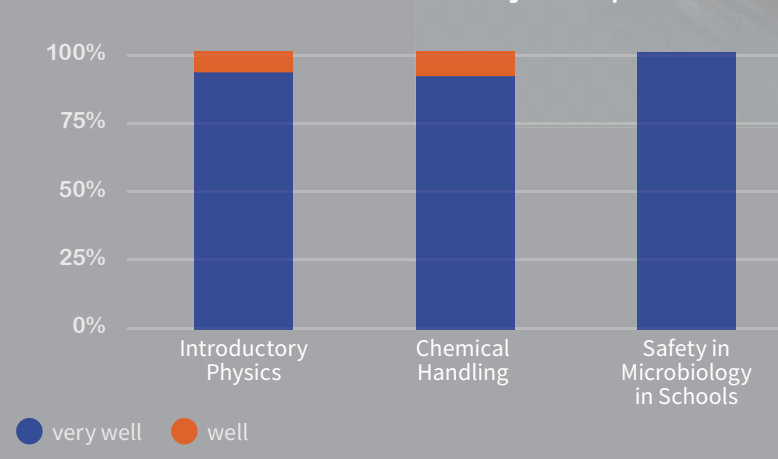
New courses currently under development

- Safe Glasswork and Repair for Technicians.

Effectiveness and relevance of SSERC PL for technicians

Our internal and external evaluation procedures confirm that our provision of professional learning remains both effective and relevant to our users.

To what extent did the course meet your expectations?



Looking forward

We are continually looking to develop meaningful and effective PL courses that meet the needs of Scotland's technician community. We hope to expand the number of SSERC Accredited Centres, which affords us the opportunity to offer these professional learning courses at more locations across the country. We are also investigating the possibility of providing an online diet of PL.



Digital skills

During 2019/2020, a range of digital skills and computer science open courses were developed and delivered at SSERC. In addition, in response to requests from schools and LAs, courses were delivered externally.

New courses 2019/2020

- Start from Scratch
- Going further with Scratch
- Creativity with iPad
- Photography and Movie Making with iPad
- Literacy and Games Design (Early and First Level)
- Digital Authoring across the Curriculum
- Microbit Digital Leader Training
- Game of Drones
- Developing Computer Science principles with Sphero

Laying the foundations of computer science

During 2019/2020, computer science was incorporated into the SSERC Primary Cluster Programme. In Year 1 all mentors engaged with two professional learning sessions:

- Laying the Foundations of Computer Science
- Magnificent Microbits.

A further seven cluster digital sessions, as part of the PCP, were delivered to support computer science and the use of iPads in the classroom.

This session has highlighted the benefits of teaching computer science in an interdisciplinary way in the classroom and beyond. Engaging learners with life skills which could further interests them and encourage them to make different career choices in the future. Extremely informative course with lots of practical ideas on how to use micro:bits in class. Well presented by Darren.



SSERC was selected as an Apple Regional Training Centre for the Dunfermline area. Being selected as an Apple Regional Training Centre highlights our commitment to facilitating training for teachers to develop skills and build confidence to use Apple technology in the classroom.

Moving forward

CRIS Mentor programme

Working in collaboration with Education Scotland and other partners, a Cyber Resilience and Internet Safety (CRIS) 'train the trainer' programme is under development. The programme aims to work with 20 identified mentors from each of the 6 Regional Improvement Collaboratives across Scotland. The trainers will be a CRIS resource to support other educators to develop their knowledge and understanding.



During 2020/2021 many of the courses developed and delivered as part of our digital offering will be adapted to run via SSERC Online Learning (a platform under development to support distance professional learning).

Course figures



8

developed and delivered in 2018/2019



17

developed and delivered in 2019/2020



28

offered (pre-COVID/Inc. in-service days 2019/2020)



465

number of delegates in 2019/2020



The Advisory Service

In 2019/2020 SSERC continued to offer advice and guidance on safe, engaging, effective practical work to support the STEM curriculum.

Key functions

- Specialist health and safety advice for schools and LAs.
- Unlimited access to specialist advisors in Primary Science, Biology, Chemistry, Digital Skills, Physics, Technology, Technician Services and Health and Safety.
- Guidance and compliance advice for radiological health and safety legislation through our Radiation Protection Adviser (RPA).
- Free management of health and safety courses for Curriculum Leaders.
- Other face to face and digital specialist health and safety courses, including radiological protection, which are heavily subsidised or free.
- Access to the SSERC website - curriculum support materials, health and safety advice and resources e.g. exemplar risk assessments for both specific subject and whole school activities.
- Recommendations on equipment and design of specialist accommodation.
- Free consultancy and technical information.
- Apparatus testing for safety, performance and conformance with standards.

Some figures 2019/2020



118885
visits to the
SSERC website



552274
page views

SSERC publications and publications to which SSERC has contributed to:

SSERC's guidance on Fume Cupboards has now been updated. The revised version is on our website.

SSERC's Head of Advisory Service worked with fellow members of the Association for Science Education Health and Safety Group on the update of the book "Safeguards in the School Laboratory". This was launched in January 2020 and provides an overview of safe school laboratory practice, referring readers in Scotland to SSERC for more detailed guidance.

All three STEM Ambassador hubs now have usernames and a password for the SSERC website. Ambassadors who intend to do practical work in schools can request website access from their hub leader. This should ensure that safety measures employed by Ambassadors are consistent with SSERC (and hence employers') guidance.





Some highlights

SSERC's primary team had a very strong presence at the Primary Science Education Conference (PSEC) that ran from 6-8 June 2019. The team shared a stand with our sister organisation CLEAPSS, who cover England, Wales and Northern Ireland. In addition to highlighting the work both organisations do to support engaging, safe, effective practical science, the teams ran a joint workshop showcasing activities that could be used in schools. It is estimated that 500 people attended the conference.

13 member institutions own a radioactive source called a protactinium generator. This source has a recommended working life of 8 years after which it requires disposal. Due to its chemical toxicity rather than the fact that it is radioactive, disposal has to be done by a specialist. SSERC has been advising schools that disposal costs could be significant. SSERC is coordinating an uplift. This should save each individual school around £300.

Advisory-related courses

The Technology team have developed courses on Welding Skills and Centre Lathe Turning, both of which have a strong emphasis on health & safety. A course on Woodturning, with a similar focus on safe use, is under development.

Following the very positive reception of our online health and safety course last session, an online Radiation Protection course was developed and delivered. It too was very well-received.

A self study course on the Safe Use of Optical Radiation was developed. This involves teachers and technicians working their way through SSERC guidance, with self-check quizzes along the way and a named tutor to contact at SSERC. Participants then submit a short assignment. Feedback from the pilot was very positive. A second course on Electrical Safety was scheduled for session 2020/2021. When it became clear in mid March that schools were likely to be closed due to the pandemic, development was accelerated to increase the amount of home learning SSERC members could undertake.

SSERC staff

The SSERC RPA has had his qualification renewed for a further 5 years. The member of staff identified as his successor training has begun to gather evidence for her required portfolio.

Members of the SSERC team attend committee meetings and events run by a variety of partner organisations and bodies such as:

- British Standards
- ASE Health and Safety Group
- CLEAPSS
- The Society for Radiological Protection
- The Institute of Food Science and Technology
- The Scottish Non-Nuclear Industries Liaison Group
- Scottish Parliament Cross Party Group on Accident Prevention and Safety Awareness.



Wider STEM engagement

SSERC continues to broaden its wider engagement offer by facilitating teacher placements and encouraging children and young people to increase their involvement in STEM activities.

STEM Ambassador programme in Scotland

As a UK-funded programme working in Scotland, the STEM Ambassador Hubs closely align their work with the educational strategies and programmes that target young people both in and out of school settings.

The key influence is derived from the *Science, Technology, Engineering and Mathematics: education and training strategy* (Scottish Government, October 2017); in which specific mention is made of STEM Ambassadors:

- Support STEM Ambassadors to engage with sectors that require more support, such as ELC, parents and families, and community learning and development.
- Use digital platforms and web-conferencing to extend the reach of STEM Ambassadors to ensure all schools and settings have access to the support and resources they can provide.
- Support the establishment of effective school-employer partnerships for STEM through the Developing the Young Workforce (DYW) Regional Groups.

All Scottish Hubs report on the same Key Performance Indicators and these include maintaining strong professional relationships with local stakeholders and STEM sector partners to stimulate and coordinate ever-improving STEM education provision. Tangible evidence in the form of both qualitative and quantitative data is used to assess impact as well as improve and innovate delivery.

The 3 STEM Ambassador Hubs in Scotland actively promote volunteer activity to support STEM interest and activity in both school and non-school groups. In Scotland the age range of STEM Ambassadors



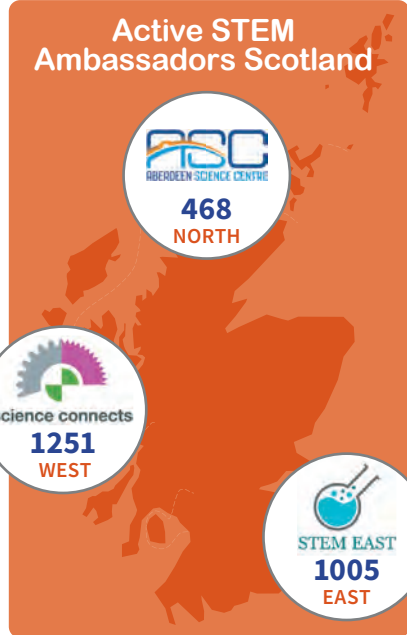
is 17 to 83 years with an almost equal gender split and approximately 10% from BME. SSERC acts as Liaison Lead coordinating the programme across Scotland and fostering links with STEM partnerships, Skills Development Scotland (SDS) and DYW.

Looking forward

SAE@SSERC took over delivery of the STEM Ambassador programme for the East of Scotland on 1 April 2020. SAE@SSERC continues with the positive work previously delivered by STEM East and, working collaboratively with the other Scottish Hubs, will deliver additional opportunities and programmes to educational establishments and community groups across Scotland.

A particular focus for 2020/2021 is how technology can enable STEM Ambassadors and others to reach and engage young people and their influencers in innovative ways. The focus will be on under-served groups and geographies, ensuring they obtain the support which makes the most difference.





The COVID-19 situation necessitated a move to enhance and develop virtual training and delivery sessions for the 6000+ STEM Ambassadors in Scotland.

The move to online induction for all STEM Ambassadors will allow Hubs to focus on offering enhanced training. Both existing and new partnerships will be used to expand activity into non-formal education settings. Recognising geographical challenges and local priorities will help develop and maintain both the capacity and capability to deliver high impact STEM inspiration whilst close working with Hubs in the West and North will create a sustainable and consistent STEM Ambassador offer across Scotland.

STEM Ambassadors North

Two STEM ambassadors who are medical physicists at Aberdeen Royal Infirmary delivered a session in which they brought along an ultra sound machine and the children carried out ultra sound scans on an agar plate with marine toy creatures hidden in the agar. The toy images then



appeared on the ultrasound machine's screen for the children to see. There was also a following activity where the children were quizzed to identify which fruit and vegetables have been scanned by the MRI machine. The STEM Ambassadors enjoyed this session as it gave them an informal surrounding to speak about both the ultrasound and MRI machines, answer questions and discuss how the machines may be used during treatment to alleviate any fears the children had.

STEM Ambassadors West

In February the West of Scotland Hub delivered a STEM Ambassador Conference for Employers. 138 Ambassadors from 75 companies attended this day-long event (funded by STEM Learning Innovation Fund. STEM partners, namely Education Scotland, Skills Development Scotland, SSERC, Developing the Young Workforce, Young STEM Leaders, RAISE and New College Lanarkshire) provided overviews of their progress within the framework of the Scottish STEM Strategy as well as highlighting how STEM Ambassadors can contribute to each of their programmes. The networking session enabled employers to meet with similar employers from their industry sector and to discuss their own Ambassador programmes, resources and possible barriers to engagement.

STEM Ambassadors East

STEM East worked with a Transport Scotland STEM Ambassador to support an S2 'Learning about Engineering' day at St Augustine's High School, Fife. Pupils used their teamwork, communication and numeracy skills to complete engineering challenges.



P5 at Victoria Park Primary School talking about the human body and things it leaves behind at crime scenes with STEM Ambassador support from Abertay University.



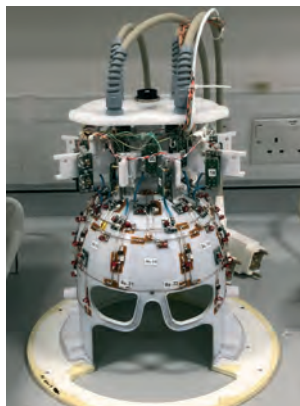
Teacher placements

In 2019 STEM Learning launched its 'Grand Challenges – Our Futures' programme, the aim of which was to help young people develop the skills needed to bridge the gap between today's learners and tomorrow's career choices. The four Grand Challenges – Artificial Intelligence, Ageing Society, Clean Growth and Future Mobility – are set to transform the way we live our everyday lives.

SSERC was allocated funding to deliver 11 Grand Challenge themed Teacher Placements, providing a unique opportunity for teachers to learn what future technologies will offer in terms of careers and job roles. Through 3-day placements, participants are more fully able to appreciate the skills young people will need to succeed in the future workplace.

Placement 1

In May 2019 five teachers attended a placement with Merck BioReliance, a leading provider of contract services in the biopharmaceutical industry. Grand Challenge participants were given practical insights into how Merck BioReliance analyse and process data from medicines, patients and gene products. They had the opportunity to carry out practical activities including aseptic technique training, robotic systems and data analysis. Participants were also given a complete overview of a Contract Research Service Company and laboratory tours of Glasgow and Stirling facilities with opportunities to review and use robotic systems.



Placement 2

In September 2019 six teachers spent time exploring how Artificial Intelligence in healthcare can positively impact patient outcomes in the form of prevention, early diagnosis and treatment. Time was spent at Canon Medical Edinburgh and at the University of Glasgow's Clinical Innovation Zone at the QEUH Campus. They gained an insight into the 'triple helix' partnership between University, NHS and industry and learned about Precision Medicine, including discussions with researchers, clinicians and companies. Site visits and professional

"It is incredibly reassuring to be able to take back the message to pupils that Scotland is leading the way in this field and a vast array of STEM skills and knowledge are required from the next generation."

discussions focused on the increasingly multidisciplinary nature of medicine, the importance of healthcare data, public confidence (e.g. around genomics and role of industry) and the many types of skills which will be required in future from engineering to physicists to laboratory technicians.

Grateful thanks to Skills Development Scotland's Life and Chemical Sciences Key Sector Manager for his support in recruiting industry partners for these placements and for expert advice.

The Biochemical Society has provided SSERC with funding to support five teacher placements in related industries over the next 3 years. Due to COVID-19 these placements have been postponed.

Moving forward

Building on our success in this area, we will be establishing a **Scottish STEM Placement Programme** underpinned by a set of principles which will be at the heart of future placement opportunities. >>



Maths Week Scotland

Maths Week Scotland is a Scottish Government initiative that has the aim to transform Scotland into a maths-positive nation through raising the profile of, and encouraging enthusiasm for, maths across Scotland. Maths Week runs in the autumn and STEM Ambassador information sessions across the 3 Hubs were delivered in collaboration with Education Scotland to inform and prepare STEM Ambassadors for volunteering during the focus week. The Hubs delivered hands-on workshops using their Fun Maths Roadshow kits to let Ambassadors know what resources are available for loan from the Hubs. Subsequently, more than 100 STEM Ambassadors volunteered across schools in Scotland.

Scottish ENTHUSE Celebration Awards 2019

SSERC was delighted to host the Scottish ENTHUSE Celebration Awards 2019 at the Engine Shed, Stirling on 14 May 2019.



These awards celebrate excellence in STEM education at primary, secondary, leadership and for technicians and support staff. Scottish winners were invited to the national celebration event at the Royal Society, London in June 2019.



Winners of the Scottish event were:

- Derek Boath, Monifieth High School (winner Excellence in STEM Teaching Secondary)
- Martin McKenna, Holy Cross Primary School (winner Excellence in STEM Teaching Primary)
- Angela Barclay, Monifieth High School (winner School Leadership in STEM)
- Karthika Paranthaman, Boroughmuir High School (winner Excellence in STEM Teaching Technician)
- Mark McShane and Graham Armstrong, Kinross High School (joint winners School Leadership in STEM)

SSERC CEO Alastair MacGregor commented:

“Professional learning has an impact on teachers and technicians, their colleagues, their school and their students and this event allowed us to celebrate the commitment of the winners to professional learning and the impact that it has had on them, their students and their school. Congratulations to all winners. The judges were blown away by the quality of all submissions and congratulations to all those who were finalists.”

Richard Lochhead MSP, Minister for Further Education, Higher Education and Science in the Scottish Government had the following message for the winners from Scotland:

“I am delighted to hear that representatives from Scotland have reached the final of the national ENTHUSE Celebration Awards. I would like to pass on my very best wishes for success at the celebration event. These awards provide an excellent opportunity to highlight how high-quality professional development in STEM benefits teachers and young people.”



Young STEM Leader Programme (YSLP)

The Young STEM Leader Programme (YSLP) provides an opportunity for young people in Scotland to inspire, lead and mentor their peers through the creation and delivery of STEM activities, events and interactions within their schools, communities or youth groups.

By sharing and celebrating opportunities with more people in more places, it is hoped that others will be further enthused and interested in STEM and consider STEM as a potential future pathway.

The award is offered in two versions:

- The **non-formal** version is aligned to **Curriculum for Excellence Second, Third and Fourth Levels (YSL2, YSL3 and YSL4)**. Young STEM Leaders (YSLs) are awarded digital badges and certificates for completing the programme at any level.
- The **formal** version is offered at **SCQF Levels 4, 5 and 6 (YSL4, YSL5 and YSL6)**, credit rated by SQA and underpinned by learning outcomes and performance criteria for each level. In the formal version, credit points and Insight data are included.



A Young STEM Leader delivering a woodworking activity in All Saints Secondary School, Glasgow.



The YSLP project team at SSERC has been working with key partner organisations and groups to develop robust programme content at all levels and to train and support Tutor Assessors and Young STEM Leaders across Scotland.

For more information visit www.youngstemleader.scot.

Pilot

YSL2 and YSL6 were the first levels of the programme to be developed for the pilot phase during academic year 2019/2020. The original plan was to have a secondary school and a community group in all six Regional Improvement Collaboratives (RICs) in Scotland. However, the positive demand for participation led to over 70 centres taking part, representing 23 local authorities in all 6 RICs. By June 2020, 155 YSL6 certificates were awarded.





At Paisley YMCA, Young STEM Leaders have been running digital skills workshops for local groups.

Young STEM Leaders across Scotland have delivered a range of activities, events or interactions, from photography clubs and computing workshops to nail salons and science experiments.

Feedback and participation from pilot centres, the working group and youth steering group was vital to refine existing levels and develop the rest of the programme in preparation for a full national launch. Sample feedback from Tutor Assessors is displayed below. It is hoped that the programme can continue to inspire and engage more young people with STEM as YLSP enters its second year.

Preliminary feedback from Tutor Assessors involved in the pilot

- 100% of Tutor assessors agree or strongly agree that YSLP is **building positive attitudes to STEM** in their centres.
- 89% of Tutor assessors agree or strongly agree that YSLP is **increasing the desire among young people to work in STEM.**
- 72% of tutor assessors agree or strongly agree that YSLP is **challenging elitism in STEM.**
- 72% of tutor assessors agree or strongly agree that YSLP creates **opportunities for children to spend time with positive STEM role models.**

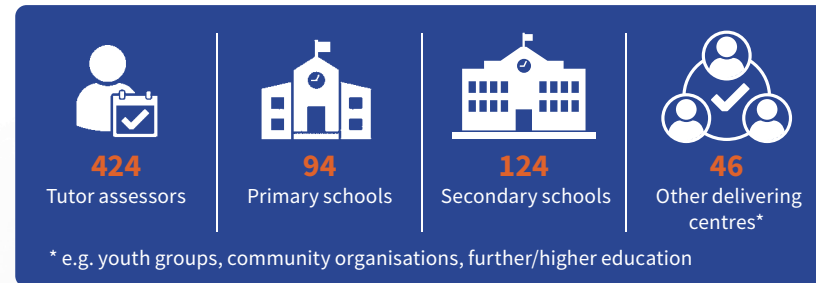
National launch

The goal for YSLP is that every young person in Scotland has access to the programme via their school, community or youth group by the end of 2022. The intermediate uptake target – set during the pilot year – is that 400 centres will be active within the programme by the end of 2020.

Since January 2020, the YSLP Project Team have developed key areas to support the full national launch of the award, such as:

- Developing the award content for **YSL3** and **YSL4** (non-formal) and **YSL5** (formal) which is available now. **YSL4** (formal) will be available to delivering centres in Autumn 2020.
- Designing a bespoke members' website to allow young people to upload and review evidence and to support Tutor Assessors to give feedback, track progress and verify the award delivery at all levels.
- Delivering information and training sessions to support new Tutor Assessors to run the award in their centres.

The current pool of Tutor Assessors and Delivering Centres across Scotland is shown below - this will increase as more training is offered.

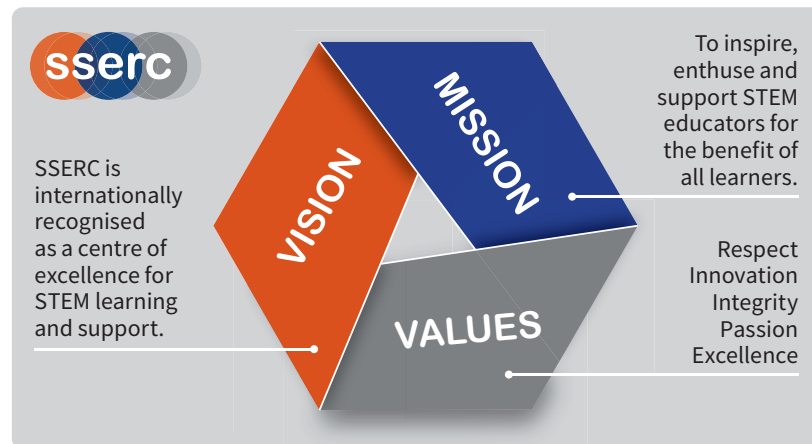


Corporate activity

During the financial year 2019/2020 the organisation made significant progress in each of the workstreams associated with Vision 2030, much of which would not have been possible without the support of the SSERC Board of Directors and Trustees and input from our stakeholders and staff.

Mission, vision and values

We took the opportunity to review our mission, vision and values. Our values underpin all that we do as an organisation to achieve our vision for 2030 and both remain unchanged. Our mission statement has been tweaked to reflect the full range of SSERC activities.



Staffing

Our staffing complement was 34 at the end of the financial year. We welcomed Jamie Menzies to the Young STEM Leader team. Our Director of Professional Learning (Paul Beaumont) left us in December 2019 and we wish him a long and healthy retirement. Our Director of Advisory

Service (Gregor Steele) intimated his desire to move to two days a week as from 1 April 2020 as part of a phased retirement. As a consequence, we were delighted to be able to appoint Kate Andrews as Head of Professional Learning and Chris Lloyd as Head of Advisory Service; both formally starting 1 April 2020.

SSERC estate

As part of our contribution to encouraging green travel, we have installed two electric charging points in the SSERC HQ carpark.

Corporate social responsibility

Leading up to Christmas we supported Fife Housing Groups' 'Give a Kid a Coat' campaign. 1300 coats were gifted and 1000 distributed across Fife and the remainder given to charity.



We were delighted to be awarded a grant from The Children's Lottery allowing us to purchase digital devices to 'loan out' to those families within the local community who may not have ready access to such. 8 devices were loaned to learners from Ballyeoman Primary School in Dunfermline. We were also able to loan devices to learners at Kirkcaldy West Primary School and Queen Anne High School.

During the year we received many visitors and guests to SSERC including: Mr Richard Lochhead MSP, Minister for Further Education, Higher Education and Science; Mr Oliver Mundell MSP and overseas visitors from a number of countries including The Netherlands, France, USA and Kyrgyzstan.



SSERC Annual Conference

The 2019 SSERC Annual Conference (the last in its current format) was held on Friday 6th December 2019 at the Carnegie Conference Center, Dunfermline. As well as the opportunity to participate in a range of interactive and participative activities, delegates were able to listen to two informative and enjoyable keynote speeches from Howie Firth, Director of the Orkney Science Festival and Graeme McAlister, CEO of the Scottish Childminding Association. <<



Howie Firth



Graeme McAlister

East of Scotland STEM Ambassador Hub

Working with employers, organisations & education

Over 1,600 STEM Ambassadors

Supporting Angus, Clackmannanshire, Dundee, Edinburgh City, East Lothian, Falkirk, Fife, Midlothian, Perth & Kinross, Scottish Borders, Stirling and West Lothian.

Delivering over 19,000 Volunteering hours*
to schools and non-school groups (*in 2019).

Providing engaging & inspirational
STEM opportunities for young people



STEM Ambassador East SSERC



email sae@sserc.scot website www.saesserc.scot

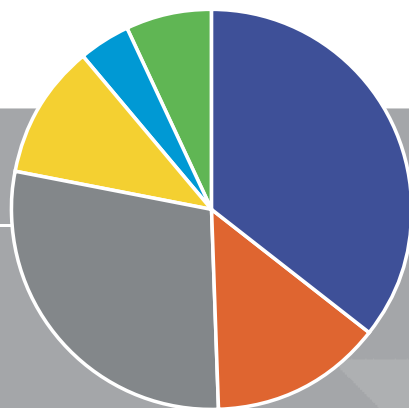
   STEM Ambassadors in Scotland

Financial overview



Income

2019/2020

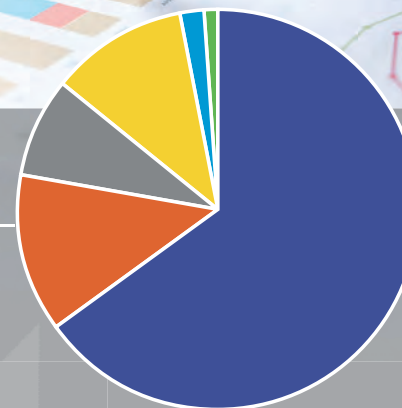


	£'000s	%
● Main Scottish Government grant	£865	36%
● Other Scottish Government grants	£330	14%
● Membership subscriptions*	£703	29%
● Income from STEM Learning**	£266	11%
● Income from PSTT	£89	4%
● Other income	£161	7%
Total income	£2,414	100%

* Local Authorities, colleges and independent schools.
 ** This includes course income where the schools were funded through Enthuse bursaries.

Expenditure

2019/2020



	£'000s	%
● Staff and secondees*	£1,672	65%
● Supplies and services	£320	13%
● Property costs	£199	8%
● Operating and administration costs	£283	11%
● Grants distributed	£59	2%
● Governance costs	£25	1%
Total expenditure	£2,558	100%

* Includes charges resulting from annual pension scheme remeasurements.



Looking ahead

As we move into financial year 2020/2021 our focus will be to continue our progress toward achieving the goals as set out in Vision 2030. Our emphasis in 2020/2021 will be on the following workstreams:

Outreach work

- Expand the geographical reach of the SSERC Accredited Centre programme.
- Investigate which other SSERC professional learning courses could be offered at SSERC Accredited Centres.
- Establish a quality forum for SSERC Accredited Centre assessors.



Outreach work (digital learning)

- Further develop our online professional learning utilising our highly regarded SSERC_Meet format.
- Expand our blended learning professional learning courses.
- Launch a range of fully online professional learning courses.
- Expand our digital offering via SSERC TV.
- Test and pilot a new online platform (SSERC Learning Online), to support our digital professional learning.



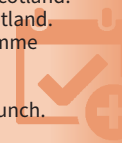
Evaluation and research activity

- Continue to use the SSERC website, SSERC publications and social media to disseminate research and evaluation data.
- Undertake follow-up impact surveys on our professional learning activities and publish the results.
- Continue to publish a range of papers in academic literature.



Wider STEM Engagement

- Launch a national strategy for the STEM Ambassador programme in Scotland.
- Establish SAE@SSERC – the STEM Ambassador Hub for the East of Scotland.
- Establish, promote and operate the Scottish STEM Placement Programme to complement the UK Teacher in Residence programme.
- Support at least two Scottish ENTHUSE Partnerships
- Move the Young STEM Leader Programme from pilot to full national launch.
- Work in partnership with the local community to support digital and STEM literacy and skills development.



2030



Advisory Service

- Promote the Advisory Service activity within Local Authorities via a bi-yearly update circular.
- Develop professional learning programmes to support the Advisory Service function.
- Seek to further promote the work of the Advisory Service across Scotland, the UK and overseas.



Business development activity

- Seek opportunities at local, Scottish and UK level to support and promote STEM Education and Training.
- Build internal capacity to undertake consultancy activity.
- Bid for relevant externally funded projects within the UK.
- Expand on sponsorship opportunities for SSERC activity.
- Market opportunities for room hire at SSERC.



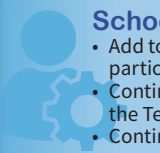
Professional learning offering

- Become a SCQF Credit Rating Body.
- Extend our existing STEM offering.
- Continue to work in partnership with other organisations to develop and deliver our professional learning programmes.
- Expand our range of digital skills and computing science programmes including the Cyber Resilience and Internet Safety Mentor programme.
- Offer increased STEM professional learning opportunities for childminders and early years practitioners.



School technicians

- Add to our range of SCQF credit and levelled professional learning courses, particularly to serve the needs of school technicians and technology teachers.
- Continue to support the Scottish Technicians' Advisory Council (STAC) and the Techne forum.
- Continue to support an annual Technicians' conference.





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