

SEERIH

Biennial Report

2018 - 2020

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Welcome

to the SEERIH Biennial Report 2018 - 2020



Established in 2014, SEERIH (Science & Engineering Education Research and Innovation Hub) is a nationally recognised specialist centre within the Faculty of Science & Engineering's Teaching, Learning and Student Experience Team.

SEERIH's sustained record of civic and national level influence shines a spotlight on The University of Manchester's commitment to developing young people. Their key focus on pre-University science teaching and learning brings a wealth of expertise and insights to our undergraduate and postgraduate programmes, as well as improving the achievement, awareness, and opportunities of young people through greater access and participation in Science, Technology, Engineering & Maths (STEM) from a young age.

SEERIH supports The University of Manchester's aims to help the next generation thrive. By working within the Faculty of Science & Engineering's Teaching College, it supports the ambitious targets to recruit excellent, motivated students who

are engaged with their own learning. By strengthening and broadening the STEM pipeline from the primary years, SEERIH models excellence in practice to ensure that young people from a diverse and underrepresented backgrounds have every opportunity to fulfil their potential in STEM.

It's important to stop and reflect on the impact and influence SEERIH has had through its coherent programme of teaching, learning and publication engagement activities, across 4 key areas:

- > **Pre-14 Science Education**
- > **Pre-14 Engineering Education**
- > **Higher Education STEM**
- > **Public Engagement**

We are proud of how SEERIH is responsive and innovative to the challenges facing STEM education and, in this report, we highlight some of the recent and current activity.

Professor Peter Green
Vice Dean for Teaching & Learning,
Faculty of Science & Engineering



What is SEERIH?

The Science & Engineering Education Research and Innovation Hub is a nationally recognised centre of science and engineering education.

We develop and engage teachers in innovative, research-informed continuous professional development programmes to ensure high-quality learning outcomes for young people.

Core principles

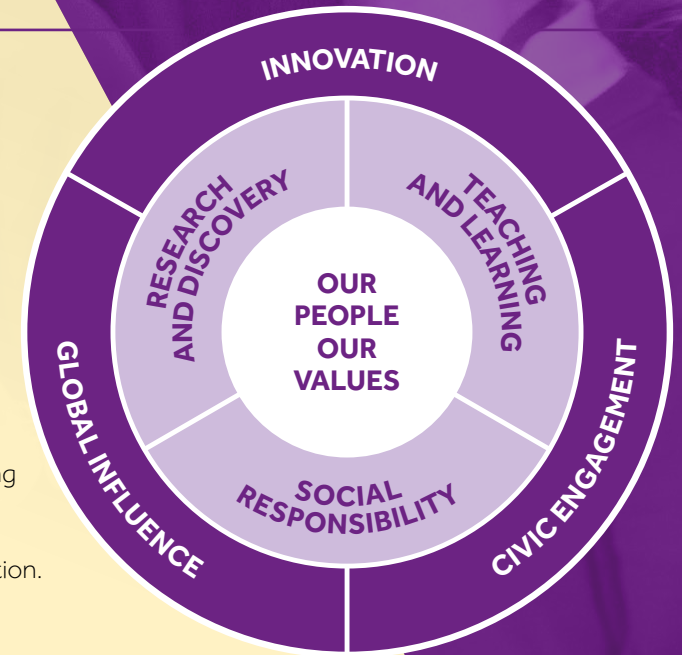
We are relentless in our ambition to push the boundaries of science and engineering education. We collaborate with teachers, University lecturers, civic and national STEM organisations in research and curriculum development to close the opportunity gap and raise attainment.

We are driven by our desire to fascinate and inspire teachers and young people about science and engineering. We make vivid the opportunities science plays in our world through national campaigns and programmes designed to engage young people, their teachers, and families to think and work as scientists and engineers.

We are passionate about defining quality science and engineering teaching and learning. We listen and respond to educators and industry, advocating, challenging and influencing national policy.

Our People Our Values

SEERIH aligns with The University of Manchester's Our Future strategy, actively embedding social responsibility across a sustained programme of research and innovation activities designed to improve the quality of teaching and learning of science and engineering in primary, secondary and Higher Education.



Why is SEERIH's work important?

Evidence shows that young people's interest in science is shaped before they leave primary school.

There is a pressing need to ensure that children do not lose that latent interest and enthusiasm in asking questions about the world around them. It is vitally important that they experience inspirational, high quality learning experiences to attain and achieve. We see at first hand the rapid

technological and scientific advancements that allow us to live well, stay healthy and protect our changing world. Science, and its related disciplines of Design Technology, Engineering and Maths, being taught well from in the primary years is of vital importance to individuals and the nation's well-being. At a national level, Britain does not have sufficient graduate and non-graduate engineers to meet the growing demands of the sector and to level up opportunities across the country.

Science learning from age 5 years is currently undervalued in comparison to other core subjects, which impacts on strategic action planning by senior leaders. Weak science subject knowledge in many teachers contributes to low confidence and poor pedagogic skills, only compounded by accountability measures from government relying on teacher assessment to report on pupil outcomes. This poses a challenge, yet one that is surmountable if teachers are afforded the dedicated time to attend regular and sustained professional development interwoven, with expert challenge and professional reflection with colleagues.

SEERIH takes on the mantle in enabling the next generation to thrive through early intervention from the primary years. By strengthening and broadening the STEM pipeline through the upskilling of teachers, we seek to inspire a fascination with science in the whole school community.

Our work engages young people from diverse and underrepresented backgrounds enabling them to have every opportunity to fulfil their potential in STEM.

The grassroots work that SEERIH leads informs and benefits undergraduate and postgraduate teaching, learning and assessment within the Faculty of Science and Engineering in the University. In offering cross-phase experiences, collaborations and joint pedagogic projects, lecturers and teachers have unique opportunities to learn together about early STEM education.

“ Our curriculum research this year showed that, in a number of primary schools, head teachers had decided to focus on English and mathematics over other subjects, including science. This was often done explicitly to improve test results in English and mathematics. We saw both quantity and quality of science teaching were reduced. In these schools, pupils were often given little access to science content. Little consideration was given to developing scientific concepts and skills and the vocabulary that comes with being taught science. **”**

Amanda Spielman, HMI Chief Inspector, Commentary on the annual report, January 2020



What does SEERIH do?

A team of science and engineering education consultants, researchers and administrative staff focus on designing and delivering a sustained programme of applied 'close to practice' research and innovation.

Our activity involves teachers from across the ten Local Authorities of Greater Manchester. Working with a wide range of STEM educational charities, Learned Bodies and Industry, short term and long-term projects are focused on science and engineering education to improve pupils' achievement. Our professional learning opportunities are targeted at in-service teachers and Higher Education lecturers, students, and STEM Ambassadors.



The Comino Foundation and SEERIH share a desire to unlock the potential of all young people by nurturing their zest for learning in Science, Technology, Engineering and Maths. SEERIH is in a unique position to inspire teachers to engage young people with up-to-date insights into the latest STEM thinking, as well as into the wide range of opportunities which STEM learning will open up to them.

Professor José Chambers, Development Fellow, Comino Foundation



SEERIH's 5-year aims are:

1 To close the opportunity gap to raise attainment in primary science and engineering education in Greater Manchester

- > by engaging teachers through socially constructed professional development aligned to the Trajectory of Professional Development (Bianchi 2017)

2 To improve primary science and engineering education beyond Greater Manchester

- > by collaborating with teachers to co-create and research innovative teaching and learning approaches aligned to the SEERIH Research Frame (Bianchi 2020)
- > by engaging young people to work and think as a scientist and engineer

3 To raise the profile and credibility of the University of Manchester as having national influence at policy-level in science & engineering education

- > by acting in advisory and consultative roles on internal and national level committees and through professional publications and presentations
- > by attaining and coaching teaching staff to attain higher level qualifications and teaching awards

4 To evaluate and evidence impact through key data returns and academic publications

We have been developing our evaluation approach, embracing the 5 levels of Professional Development (Guskey 2016). Our processes include:

- Theories of change and monitoring
- Annual Evaluation survey for teachers and educators
- Use of HEAT to report on pupil engagement in SEERIH projects
- Survey questions embedded in digital webinars/courses
- Engagement data analysis
- Digital media analytics related to websites and new resources

Our research outcomes enable in-depth evidence related to influence and impact on teachers and science teaching using:

- Action and participatory research
- Case study
- Thematic Analysis

5 To embed social responsibility with key focus on Widening Participation

SEERIH actively target initiatives towards Widening Participation in STEM Education enabling fairer access to a inclusive education for students from all backgrounds. In 2018 – 2020, our programmes reached:

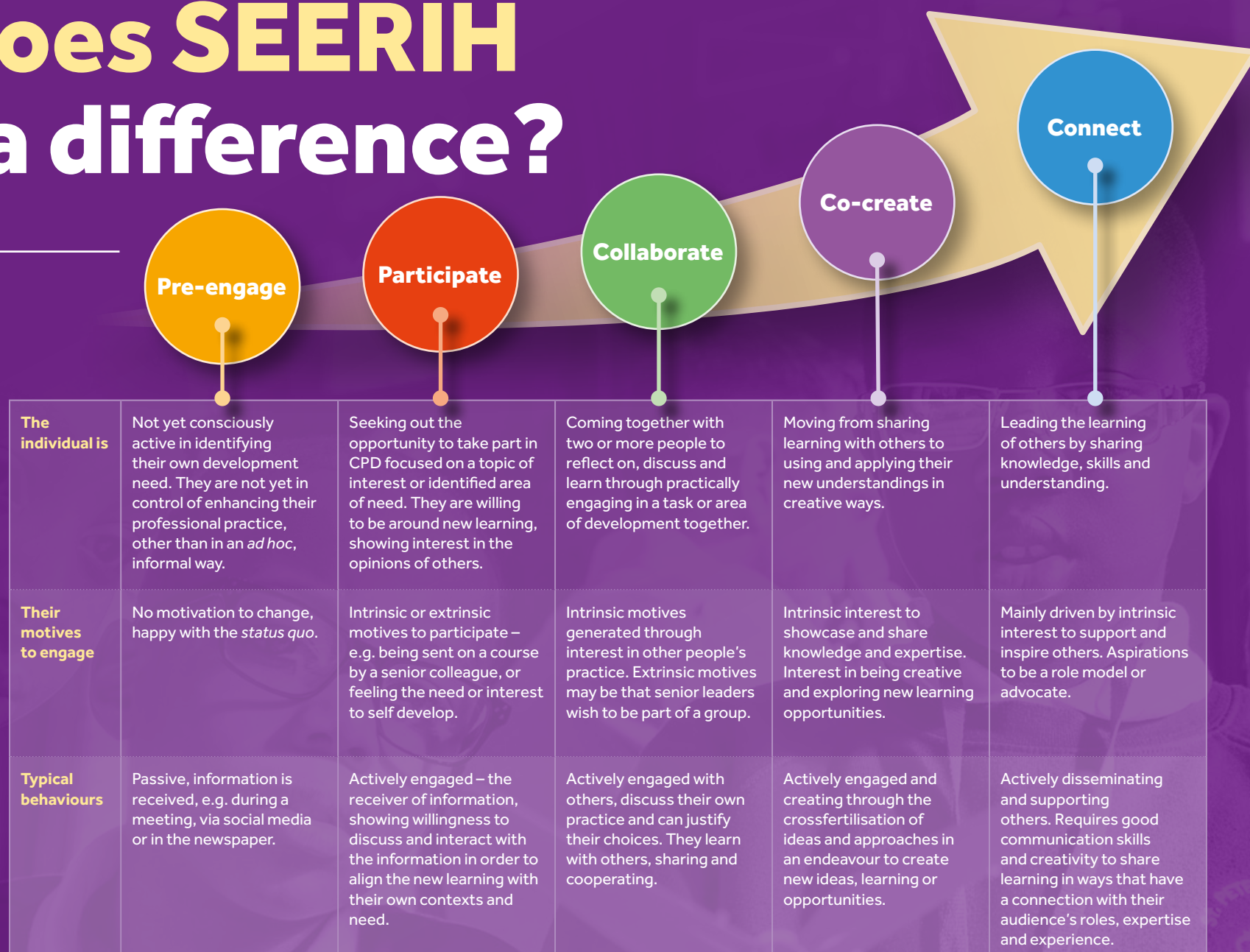
- > 44% of primary schools in GM, 50% of those being in areas of high socio-economic deprivation.
- > Our national campaigns achieved 55% school participation from areas of high socio-economic deprivation, above the average of all schools that fall within these categories.



How does SEERIH make a difference?

SEERIH's programme demonstrates sustained record of development activity that integrates social responsibility and is aligned to the 5 stages of the Trajectory of Professional Development: pre-engage, participate, collaborate, co-create and connect.

Public engagement campaigns enable us to reach beyond our civic responsibilities to impact on young people much further afield, through the Great Science Share for Schools and Greater Manchester Engineering Challenge.



Making an impact

How many pupils do SEERIH's programmes influence?

410k



SEERIH successfully engages teachers in schools within Widening Participation priority areas

40% is the average proportion of Widening Participation priority schools (highest socioeconomic deprivation) across England.

46%
3% increase from 2018 to 2020

How many schools did SEERIH engage?

1,171



127

scientists and engineers from industry and academia profiled



174

organisations engaged and connected through SEERIH programmes

How many teachers engage with SEERIH?



2018-19
794

2019-20

1,017

How many hours of professional development sessions did teachers engage in?

2018-19
3,645

2019-20
5,331

Teachers said...

Training was relevant to needs

97%

I'm more confident in the topic

96%

My practice improved

96.5%

SEERIH's social reach

6,037
followers

2.2m
impressions

@UoMSEERIH | @GreatSciShare

Our response to the global pandemic from March 2020 was swift, with the ethos of not postponing or cancelling our offer to schools and educators. In fact, this created a vibrant opportunity for creativity, reflection, and innovation.

We've moved to embrace blended learning approaches within all SEERIH teacher professional learning – using webinars, videos, digital collaborative tools, and web resources. In addition, live lessons direct to pupils, as well as home-school learning resources have resulted in growth in uptake of professional and pupil learning experiences.

seerih.manchester.ac.uk

seerih-innovations.org



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Pre-14 Science Education

Science is a core subject and an integral part of how we live and function today.

Many primary teachers take on the role of Science Subject Leader in their school with few related qualifications. Their role is crucial if schools are to raise standards and yet it is known that training in this role is limited.

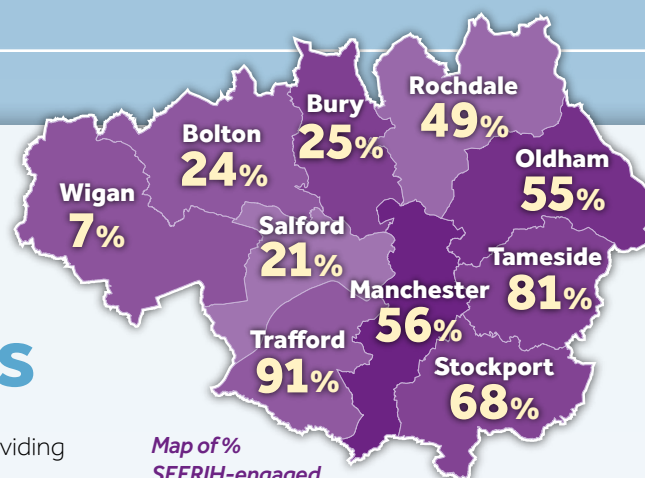
Regional Science Networks

Since 2014, SEERIH's role in providing civic-wide, termly professional development for Science Subject Leaders has led to 100% access to termly, Regional Networks.



UoM SEERIH Primary Science Subject Leader Networks

[WATCH THE VIDEO](#) 



Map of % SEERIH-engaged schools 2018-20

Teachers are supported through course inputs, mentoring and reflection to participate with colleagues from their local area. Networks focus on themes related to coordinating, implementing, and assessing the National Curriculum for Science, understanding of scientific concepts and processes. To support senior leadership teams on a school-based level, a SEERIH Deep Dive offers a one-day diagnostic review of science learning. These give feedback to staff based on evidence drawn from lesson observations, pupil voice and work scrutiny.

[FURTHER READING](#) 



The SEERIH Primary Science Subject Leader Network is an amazing chance for teachers to strengthen and develop skills to help our pupils to work scientifically within our science lessons, rather than doing an investigation they are told to do. The fact it is more than a one-off session means we are able to try things out in school and come back to the next session to talk about how it went and what we can do to make it better. The sharing of experiences and ideas is invaluable. Children at school enjoy their science lessons more because it is about them creating their enquiries and developing their scientific skills as well as knowledge.

Sarah Wilson,
Science lead, 12 years teaching



Improving children's scientific questioning.



Research and innovation programmes such as this, draw on SEERIH's partnerships with leading national charities and organisations, including the Primary Science Teaching Trust. QuSmart is a research and innovation study in which teachers co-create and trial teaching and learning approaches. In this case, focus is given to improving the quality of scientific questions asked when working scientifically. A fundamental starting point within the scientific method, this area of learning and development is often given superficial attention, when it crucially steers the enquiry processes.

Science teachers (primary and/or lower secondary) collaborate within and across schools, with leading experts, to engage with research to inform practice. They receive professional development through Immersion Events, webinars and 1-2-1 coaching, leading towards involvement in participatory action researchers to trial and evidence children's responses. Outcomes include the creation of products including courses, resources, publications and academic research papers.

[VISIT THE WEBSITE](#)



The engagement with SEERIH continues to be one of our strongest partnerships. This is because the work that Lynne and the team lead is meant to be embedded – and it certainly has been at our school and with our partners. The fact that the relationship between Science teachers in Secondary and those in primary are cultivated over time means that there is strength in relationships and trust in practice. There is no greater evidence of this than the fact that during the various lockdowns, we have continued to work closely with our primary partners, facilitated by SEERIH to support our children. I think that is the strength of SEERIH and the work that has been undertaken.

Janice Allen, Headteacher, Falinge Park Primary School



Related publications and published papers

Bonsall, A. & Bianchi, L. (2019) Children's scientific question-asking – an initial scoping of academic literature. Journal of Emergent Science, Winter 2019/20; Vol 18, 29–34, The Association for Science Education. [READ HERE](#)

'Child-led and child-designed investigations were being undertaken 'occasionally' or 'never' in 47% of schools.' (Wellcome Trust 2017). [READ HERE](#)



This set of web resources are the outputs created by teachers from 6 schools in Stockport and North Manchester collaborating over the period of 2 years. SEERIH led them in their collective ambition to develop and trial family-focused science activities. Their commitment to enhancing school-community links involved Science Subject Leaders and colleagues creating 16 activities to raise the profile and engagement in science, thereby actively addressing young people's Science Capital.

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Smarter Choices

A 3-year research and innovation study improving science pedagogy for disadvantaged pupils across the Key Stage 2-3 transition.

[VISIT THE WEBSITE](#)



School-University Fellowships

The SEERIH School-University Fellowship programme brings in-service STEM teachers into the team for specific periods of time or against key programmes. The sustained commitment to working with practising teachers means that the realities of school and classroom life can be fully considered in research and innovation activity. For teachers, it is a unique embedded experience of working in a Higher Education setting and results in opportunities to co-create and connect beyond their school and have civic and national level influence.



My fellowship has enabled me to collaborate with feeder schools, strengthen networks and widen my school's participation in developing a range of projects. I have been able to embed and deepen my understanding of how research at SEERIH is undertaken and have been given time and support to develop a range of skills which have helped me to build long lasting relationships with school partners.

Rose Edmondson, SEERIH School-University Fellow





I have collaborated with SEERIH on several projects encompassing public engagement and outreach into schools. It has been really rewarding to be able to make connections with teachers and pupils. I have enjoyed sharing my own thoughts on what being an engineer means, and the breadth of different topics that fall within the engineering umbrella. I hope this has helped to spark interest with some pupils to consider a future in engineering. It is so important to make connections between industry, Higher Education and schools to ensure our future engineers are encouraged and inspired to be the next generation of problem solvers and innovators.



Ben Parslew,
Senior Lecturer in Aerospace Engineering,
The University of Manchester

A snapshot of more of SEERIH's pre-14 science education activity



Guidance for STEM professional-school partnerships towards improving the focus, planning and delivery of great outreach experiences.

VISIT THE WEBSITE



A website resource improving teacher knowledge about progression in working scientifically across the primary and Key Stage 3 curriculum.

VISIT THE WEBSITE



A children's science book encouraging children's talk about what it is like to be a scientist.

VISIT THE WEBSITE



Bespoke primary and secondary teaching resources linked to the esteemed lectures given by Professor Danielle George, Kevin Fong and Saiful Islam.

VISIT THE WEBSITE



A Science & Technologies Facilities Council funded project bringing together scientists and primary and secondary teachers to explore the Diamond Light Source Facility, drawing out and challenging public ideas about what scientists do.

WATCH THE VIDEO



Pre-14 Engineering Education

Our engineering education work is undertaken in partnership with the Royal Academy of Engineering.

We have pioneered the Tinkering-for-Learning pedagogical approach, which has unlocked many opportunities to engage young people in thinking and working as an engineer. Although not a subject discipline in the younger years, engineering education makes meaningful connections between the Mathematics, Design Technology, Science and Computer Science curriculum.



As an STEM professional, working with schools has been really valuable and SEERIH has enabled my organisation to develop a relationship with local education providers and importantly to contribute to inspiring the next generation. Personally, I have also developed my own communication, organisation and knowledge sharing skills.

Chloe James,
Integrated Logistics Support
Engineer, BAE Systems



This commenced in 2014 with the Tinker Tailor Robot Pi – a SEERIH research and innovation project. Involving the collaboration between primary and secondary teachers, university academic engineers, business partners and pupils aged 5-14 years, the focus of the work has been to explore how a pedagogy

for engineering in mainstream primary schools could be established (Bianchi & Chippindall 2016).

The term tinkering has been used by teachers as a bridge to move across the boundaries of engineering and education and as such promotes the ethos of play and experimentation within the curriculum and classroom. Tinkering is exploring through fiddling, toying, messing, pottering, dabbling, and fooling about, with a diverse range of things that happen to be available, in a creative and productive pursuit to make, mend or improve. Using this working definition, a wide range of

teaching and learning approaches have been co-created and trialed and the phrase 'Tinkering-for-Learning' coined to clarify the purposeful learning outcomes aligned to this iterative approach, that builds upon the 'Engineering Habits of Mind' (Claxton, Lucas & Hanson 2014).

Related publications and published papers

Bonsall, A., Bianchi, L. & Hanson, J. (2020) 'A scoping literature review of learning progressions of engineering education at primary and secondary school level'. Journal of Research in Science and Technology Education. [READ HERE](#) (UoM login required)

Bianchi, L. and Chippindall, J. (2016) Tinkering – a signature pedagogy for engineering education in the primary school? Conference Proceedings 6th International Symposium for Engineering Education, The University of Sheffield, July 2016. [READ HERE](#)

Lucas, B., Claxton, G., & Hanson, J. (2014). *Thinking Like an Engineer: Implications for the education system.* [READ HERE](#)

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tiny tinkering tasks

12 Tiny Tinkering Tasks provide innovative and creative STEM starter-lessons that embed the Engineering Habits of Mind and real-world engineering contexts.

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Halléoojamaflipphone

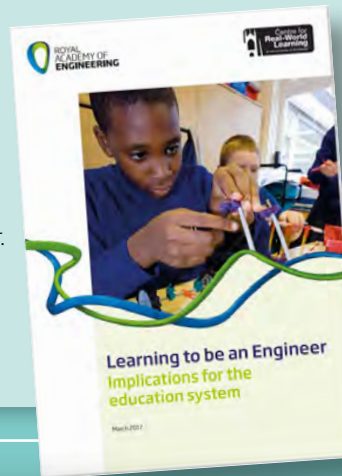
Lesson resources linked to the Electrical and Electronic Engineering Department's development of the amazing musical instrument that combined creative engineering and social responsibility.

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Engineering Education Policy Reports

Lucas, B., Hanson, J., Bianchi, L., Chippindall, J. (2017). *Learning to be an Engineer Report*. The Royal Academy of Engineering and the University of Winchester. [READ MORE](#)



Bianchi, L., Chippindall, J. (2018). *Tinkering for Learning: Learning to teach engineering in the primary and KS3 classroom*. The Royal Academy of Engineering and The University of Manchester. [READ MORE](#)



The opportunity to think like engineers has positively impacted the resilience, confidence and creativity of Rode Heath pupils and has enriched their learning experience. Being involved in SEERIH's programmes has allowed teachers at Rode Heath to widen their knowledge of STEM subjects by collaborating with professionals from other educational establishments and gaining access to an extensive range of engineers – all of which has benefited our pupils immensely.

Julie Wiskow,
SEERIH Teacher Champion



Higher Education STEM

As a world-leading University there is a firm commitment to inquiry into practice in higher education teaching.

Cross-phase collaborations with pre-University educators stimulates professional dialogue about teaching, learning, assessment and feedback processes and practices.

SEERIH's unique position to broker connections between academics, students and teachers has resulted in three Centre for Higher Education Research, Innovation and Learning (CHERIL) projects.

[READ MORE](#)

Yes...But!

The Yes...But! project continued the cross-phase studying of pedagogy in STEM, expanding to the involvement of 16 academics and students from MACE. A core focus on improving student feedback linked to the strategic development goals of the Faculty of Science & Engineering. Action Research structured the collaborative activity over an 18-month period, which resulted in a series of academic poster presentations as well as the project summary film.

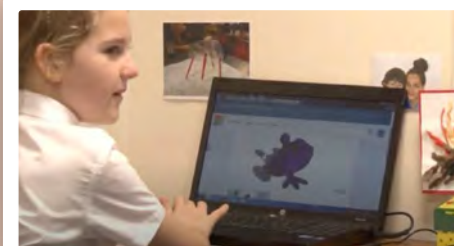
Mind the Gap

Mind the Gap adopted a Lesson Study approach to create a disciplined approach to academic-teacher collaborations. Lecturers from the Department of Chemistry, Electrical & Electronic Engineering and Mechanical, Aerospace & Civil Engineering (MACE) joined with primary and secondary STEM teachers, to observe, plan and co-deliver lecture and lesson experiences. Three working groups studied approaches to enhance student engagement, questioning and collaboration by drawing on each other's expertise and experience. This work was presented at the World Association for Lesson Study in China.

Across the Divide

Across the Divide was a 12-month project that promoted dialogue about STEM practice and pedagogy between academics from the Faculty of Science & Engineering and primary and secondary teachers (Ralls et al, 2018). Academics visited pre-16 schools and colleges, they were involved in lesson observations and senior leadership conversations related to the purpose and practice of STEM teaching and learning. Key observations about the embedded use of explicit learning outcomes, the learning environment, use of digital and technological resources and assessment and feedback stimulated critical reflection on practice. By identifying the similarities

and differences between Higher Education and school provision, we can be aware and mindful of the transition experiences of our undergraduates in order to further support the ongoing development of an excellent student experience.



**WATCH THE FILM
TO LEARN MORE**



**WATCH THE PROJECT
SUMMARY FILM HERE**



A snapshot of more of SEERIH's HE STEM activity

4th Year Educational Research Projects

Enhancing student-led project work by improving reflective group practice within the Department of Chemistry.

Student Professional Practice in MACE

Enhancing individual and group work during project work aligned to the UK Specification for Chartered Engineers.

Related publications and published papers

Slaughter, J. L. & Bianchi, L. (2019). *Student-led research groups for supporting education research projects*, in SEERY, M. K. and McDonnell, C. (Eds) *Teaching Chemistry in Higher Education: A Festschrift in Honour of Professor Tina Overton*, Creathach Press, Dublin, pp. 301-314.

Ralls, D., Bianchi, L. & Choudry, S. (2018). *Across the Divide: Developing Professional Learning Eco-Systems in STEM Education*. *Research in Science Education Journal*. [READ MORE](#)

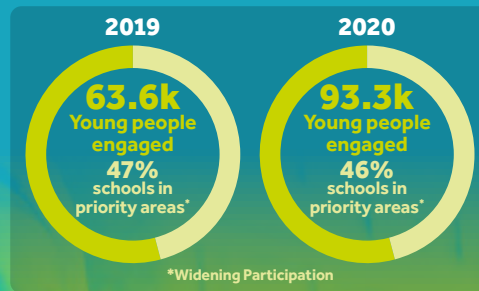


Public Engagement

Enhancing the public understanding and engagement with scientific knowledge and research are means by which we share ideas and research, inspire discussion, and involve the public.

SEERIH has pioneered two national campaigns successfully reaching schools across the United Kingdom and beyond.

Great
Science
Share
for SCHOOLS



GSSfS is an annual, national campaign to inspire 5-14 year olds into science and engineering.

With the status of primary school science low, the campaign provides a unique inclusive, non-competitive, and collaborative experience promoting rich opportunities for pupils to practically engage in scientific investigations with peers, family, and teachers.

Since 2016 it has successfully inspired the sharing of pupils' scientific questions and investigations; stimulated science learning related to real-world issues and led on developing collaborative UK-wide networks with science education organisations.

“

The main impact of the GSSfS will continue to be the opportunity for children to share their own work with a wider audience, building their own understanding of themselves as scientists and the science that they are learning.

”

Liz Lawrence,
CSciTeach Advisory Teacher at BDSIP,
PSQM and Senior Regional Hub
Leader for London and the South East



MAKING A
DIFFERENCE



THE GLOBAL GOALS



@GreatSciShare

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The campaign was refined in 2020 to complement face-to-face events with a fully digital offer. This now sees a series of themes over 6 weeks, linked to the United Nations' Global Goals for Sustainable Development, that inspire thousands of young people to ask and share scientific questions that matter to them. Novel approaches include Question Makers, weekly Live Lessons, scientist, and engineer engagement through #AskAQuestion and live Q&A and Twitter chats, as well as opportunities to communicate science through the Arts.

A team of UK-wide Regional Champions now support the goals to increase engagement and quality of GSSfs. Key sponsors including BASF, Siemens, and Manchester City Council along with a wide range of national STEM organisations and Learned Bodies.

Awards

Better World Showcase Award
Winner 2019, 2020

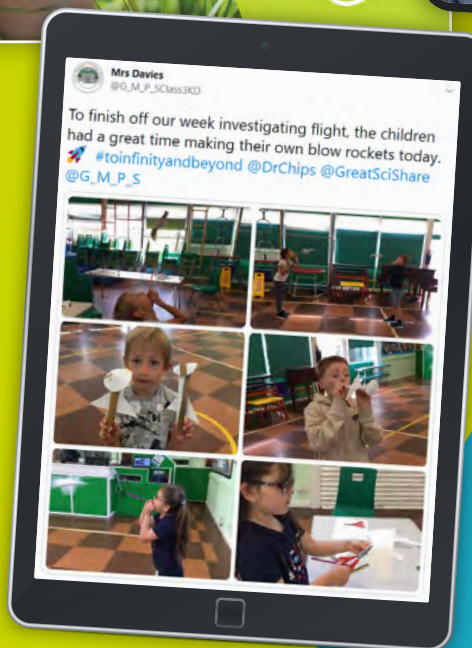
Making a Difference Award for
Social Responsibility 2017, 2018

National Chemical Industries
Association Reputation Award
2018

Chemical Industries North West
Sustainability Award 2018



Read the Primary Science Journal Special Edition



“ We have come a long way with science in Fairview, with a gradual empowerment of pupils and staff. The Great Science Share has given the whole school community an opportunity to showcase that improvement each year. We are looking forward to the next step and to 2021.

Neil McAllister,
Deputy Headteacher,
Fairview Primary School



”

 [@GreatSciShare](https://twitter.com/GreatSciShare)

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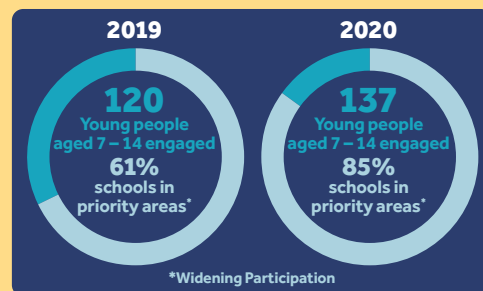
Public Engagement

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GMEC

Greater Manchester Engineering Challenge



“ Nearly 100% of our pupils have English as an additional language, so it's been a fantastic opportunity for them to come, communicate with other schools, and other pupils from different backgrounds; and particularly showing them what engineering is like, and showing them the aspirational side of engineering. The teamwork is just brilliant and I think it's been a fantastic project to be involved in, giving a lot of opportunities to our pupils.

Teacher participant
from GMEC 2020

”

Greater Manchester Engineering Challenge (GMEC) is an engineering-focused annual campaign designed to address the limited opportunities for design and making activities within the curriculum. School accountability measures have led to less time given to creative subjects, whilst OFSTED reinforce that meaningful and interconnected learning experiences are essential. GMEC draws on the best features of Greater Manchester engineering and has inspired 7-14 year olds to creatively respond to engineering challenges. Links to industry and University engineers and students have seen mechanical and electrical engineering come to life in the The Big Marble Run Build and civic and construction engineering profiled through the ExtraOrdinary Spaces Challenge.

GMEC is a practical way in which our research into engineering in primary schools can be spread more widely to model how engineering can connect curriculum learning in Mathematics, Design Technology and Science; and raise aspirations and challenge stereotypes towards engineering for disadvantaged learners.

The campaign involves resources to engage young people in the Engineering Design Cycle, including teacher professional development and live lessons. Over 60 University and industry engineering students and staff are profiled and linked to schools to support the creative challenge responses from pupils.

VISIT THE WEBSITE TO READ MORE

A snapshot of more of SEERIH's Public Engagement activity

Greater Manchester STEM Collaborative

The sharing of practice between STEM educators in association with the Greater Manchester Combined Authority.

Outreach Development

Support for academics and students involved in primary and secondary school outreach, e.g. Droso4schools Project. [READ MORE HERE](#)

Guest lectures

School liaison e.g. World Book Day Assemblies.



Where next?



The seven-year journey from the launch of SEERIH to now has been a tremendous experience.

Establishing a brand-new hub came with many creative opportunities and challenges, which have been supported through a strong Faculty vision towards strengthening young people's engagement in STEM learning from the primary years. In doing so we have harnessed the power of the strongest influencers on young people – their teachers and their families, at a critical and formative age.

This report highlights the success of our work to close the opportunity gap to raise attainment in primary science and engineering education, in Greater Manchester. We know that although a good start has been made, there is still more to do. The pandemic has seen a reduction in practical science work across the sector – something we know is often the trigger point for young people's interest in STEM. Government perpetuates the perception that science is no longer a core subject, resulting in many school leaders

not allocating sufficient time for teacher professional development or funding to resource this vital area of learning. To our gift, we value the position that OFSTED has taken in encouraging schools to define their own intent for the curriculum, and valuing opportunities where children's learning is meaningful and memorable. This is where science, technology and engineering really come into their own. Worthwhile literacy and numeracy skills can readily be applied and used, enhancing and connecting learning for young people. SEERIH will continue to influence practice by working strategically with GM educational partners, including Teaching Schools, Multi-Academy Chains and Local Authorities to upskill in-service teachers with pedagogical and subject content knowledge.

Our work to model this connectivity shines through the success we have seen with our public engagement campaigns. Our UK position is strong, and something which will be strengthened through research publications and policy-level advisory roles. These opportunities have grown apace yet more time and investment is needed to ensure that the messages SEERIH shares in the sector are robust and evidence informed. We look ahead to the

implementation of our research framework, which increasingly sheds light onto the disadvantaged learner's experiences in science. At a time when we recognise that an increasing number of children are vulnerable in our city, we must work to understand how best the science teaching profession can play their part in using inclusive teaching and learning approaches.

There have been many reasons to celebrate over the past few years, with a range of awards recognising the novelty and relevance of SEERIH's work. Sustaining those initiatives and diversifying our approaches in response to school and family needs is vital. Working ever more closely to share learning within Faculty, and specifically with the Teaching College, with Public Engagement and Social Responsibility teams will be the way that we can learn from and alongside others. We value the incredible and innovative work that goes on within the University – the opportunities to learn are rich and diverse – just there for the taking.

As we enter the next phase of SEERIH's journey, we will continue to deliver and evaluate an increasingly blended and digital offer to schools and colleagues alike.

Promoting active learning online, reflective professional practice and providing responsive feedback using digital tools will undoubtedly be areas of work that we all share.

As a first report on SEERIH's work, I thank every member of the team, past and present, and all those who have championed and overseen our progress. We look forward to what is to come, to embracing and understanding the educational landscape that our amazing City of Greater Manchester holds, and using that to collaborate and influence science and engineering educators UK-wide and beyond.

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