

**Laura Lazenby**  
**Head of Design and Technology, Director of STEAM**

**Case Study: Collaborating Across Schools to Drive Improvements in STEM Pedagogy**

- Top tips for establishing a local partnership with other schools to spread best practice
- Implementing regular networking events to share curriculum resources and the latest tools in teaching
- Insights into hosting a yearly conference to boost the skills and confidence of teachers
- Providing targeted training for Design and Technology teachers to improve their pedagogy
- Tools for monitoring and measuring progress to ensure positive teacher development








# How the MK Enthuse Partnership started in 2018

## How it works

At the heart of every ENTHUSE Partnership is a collaboration between 6 – 10 schools or colleges, supported by £20,000 worth of support over 2 years.

Each Partnership will develop a tailored two-year action plan, including:

-  teacher CPD combining residential, local and online courses
-  free, curated and quality assured resources
-  teacher placements in a STEM-related industry or university department
-  engaging with STEM Ambassadors to inspire young people
-  STEM Clubs to engage young people and develop practical skills



## Benefits and impact

### Impact on young people:

- Increased attainment in STEM subjects, narrowing the gap for disadvantaged students.
- Increased interest in STEM careers: more students interested in working in STEM industries.
- Increased understanding of STEM careers: more students aware of the qualifications and routes to progress in STEM

### Impact on teachers:

- Increased subject and pedagogical knowledge
- More confident and able to link their teaching to STEM careers
- Better equipped to draw on the opportunities offered by STEM employers
- More able to support STEM enrichment activities



[ENTHUSE Partnerships for schools and colleges | STEM](#)



the **Hazeley**  
ACADEMY

# Top tips for establishing a local partnership with other schools to spread best practice

Denbigh	Lord Grey	Ousedale	Radcliffe	St Paul's
<ul style="list-style-type: none"> <li>• Growing staff participation</li> <li>• Post-16 subject ambassadors</li> <li>• Logistics of assessment</li> <li>• Sticky knowledge and retrieval practice</li> <li>• Seating plans for progress</li> <li>• Extra-curricular; Airengineers</li> <li>• Extra-curricular; Robotics</li> <li>• Extra-curricular; GCSE support</li> </ul>	<ul style="list-style-type: none"> <li>• Growing staff participation</li> <li>• Planning and delivery of CPD for partnership colleagues</li> <li>• Fusion 360 in the classroom</li> <li>• Pupil enthusiasm for D&amp;T</li> <li>• Developing the KS3 curriculum to better incorporate CAD</li> <li>• Development of the learning culture in D&amp;T; overcoming stereotypes, problem solving, experimenting without fear of failure</li> <li>• Greater links with industry and industrial practice</li> <li>• Careers advice within D&amp;T</li> </ul>	<ul style="list-style-type: none"> <li>• Growing staff participation</li> <li>• Communication between colleagues to effectively share developments</li> <li>• Development of Sol and culture within the department in light of CPD and training</li> <li>• Implementing developments and improvement strategies</li> <li>• Analysing the impact of developments and CPD</li> <li>• Raising the profile of the department through enrichment (Airengineers and UKRoC)</li> <li>• Raising the profile of the department through raising careers and industry awareness</li> <li>• Development of KS4 Sol to better support excellent pupil outcomes</li> <li>• Development of the learning culture in D&amp;T; overcoming stereotypes</li> </ul>	<ul style="list-style-type: none"> <li>• Growing staff participation</li> <li>• Implementation of strategies including those from "mark, plan, teach"</li> <li>• Extra-curricular; Airengineers</li> <li>• Extra-curricular; inter-school competitions</li> <li>• Parental engagement via positive contact home</li> <li>• Further development of equipment and resources</li> <li>• Greater links with industry and industrial practice</li> <li>• Careers advice within D&amp;T</li> <li>• Development of the learning culture in D&amp;T; raising expectations, STEM careers</li> </ul>	<ul style="list-style-type: none"> <li>• Growing staff participation</li> <li>• Planning and delivery of CPD for partnership colleagues</li> <li>• Raising parental engagement with year 11 being a priority</li> <li>• Providing parents with support material closely aligned with the requirements of the NEA and technical principles exam</li> <li>• Supporting colleagues to diagnose areas for development in their teaching</li> <li>• Develop mechanisms to provide in-department and in-faculty CPD and collaboration</li> <li>• Developing the KS3 curriculum to better meet new KS4 and KS5 learning needs</li> <li>• Develop further the initial planning for technical principles T&amp;L</li> </ul>

- Narrowing the gender gap in D&T
- Raising the profile of D&T in our schools
- Improving outcomes
- These were consistent and agreed challenges across all of our schools

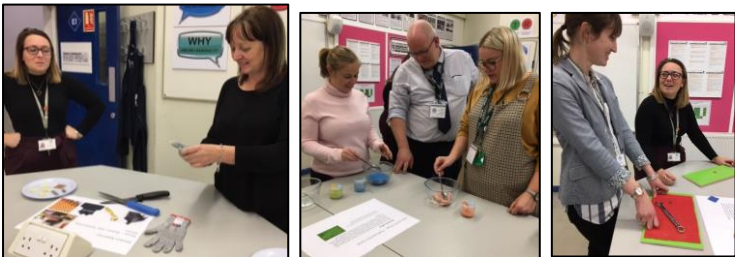
- Supporting smaller departments: creating a team outside of individual schools
- Growing local D&T leadership capacity
- Improved D&T outcomes for boys
- Easy access to CPD which was needed

Having a shared aims but finding our individual action points within each school, to identify the links between us.





# Implementing regular networking events to share curriculum resources and the latest tools in teaching (Coffee and Cake Meetings)



## Plan for Year 2:

As discussed at recent 'Coffee and Cake' - Paul and Laura need to put forward a CPD plan for Year 2. The proposed direction was;

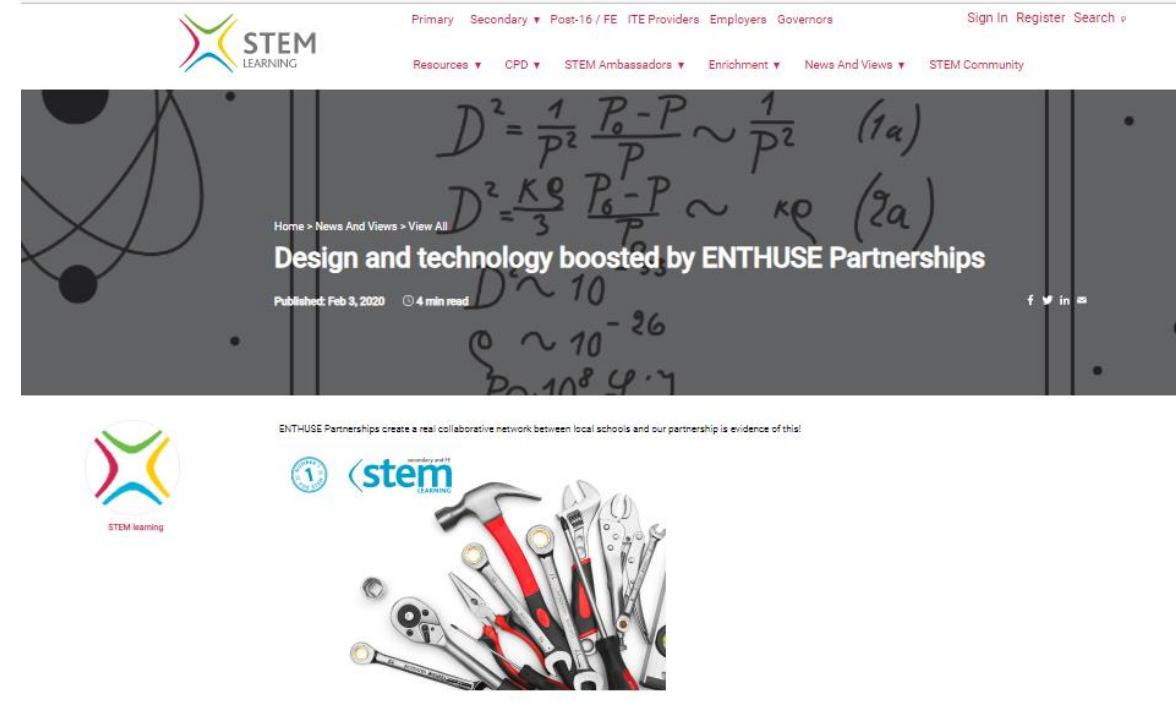
- Coffee and Cake meeting will be transforming into 'School Showcase' events where there will be a focus presented by the hosting school. This could be examples of students' work, projects/SOL that students are following, interventions that work - the possibilities are endless.
- Arrange a meeting in early June after GCSE contexts have been released by exam boards.
- Plan to hold our own Celebration event at the end of Year 2, giving us an opportunity to recognise work from both for staff and students within each Partnership school.
- STEM learning CPD – We will try to organise for courses to be held in MK
- Primary D&T CPD - to explore the possibilities of supporting feeder schools.
- Bespoke CPD – curriculum development, subject specific CPD, Careers/Gatsby in D&T,
- Meets to discuss the Year 11 s and lessons learnt (debrief)



## ENTHUSE Partnership of the Year

"The MK D&T ENTHUSE Partnership, based in Milton Keynes. This partnership has been a remarkable example of how schools working together can help a subject really thrive, especially one which is often undervalued like Design and Technology. From the 'coffee and cake' networking events, to a yearly D&T conference they have boosted the confidence and skills of their teachers"

# Sharing and recording good practice



[Design and technology boosted by ENTHUSE Partnerships | STEM](#)



the **Hazeley**  
ACADEMY



# Top tips for establishing a local partnership with other schools to spread best practice

The image displays a grid of 12 newsletter pages from the MRC D&T ENTUSHE Partnership, numbered 1 to 12. Each page features various articles, photos, and tables related to school activities and partnerships.

- Page 1:** Newsletter Half Term 2 2018-2019. Recent activities: 18th October - Launch evening for the ENTUSHE Partnership... 19th November - All members of the Partnership were offered a place @ the... 20th November - The afternoon meeting was kindly hosted by Richard... 21st November - The afternoon meeting was kindly hosted by Richard... 22nd November - The afternoon meeting was kindly hosted by Richard...
- Page 2:** Similar layout to page 1, detailing partnership activities.
- Page 3:** A large table with multiple columns and rows, likely a schedule or list of activities.
- Page 4:** STOP PRESS!! The Institute Partnership has for the first time... MRCITIZEN... MRCITIZEN... MRCITIZEN...
- Page 5:** Last Day update... The afternoon meeting was kindly hosted by Richard... MRCITIZEN... MRCITIZEN... MRCITIZEN...
- Page 6:** Similar layout to page 5, with photos and text.
- Page 7:** The Robotics Club update... The afternoon meeting was kindly hosted by Richard... Robotics Club... Robotics Club... Robotics Club...
- Page 8:** In Schools... The afternoon meeting was kindly hosted by Richard... In Schools... In Schools... In Schools...
- Page 9:** Similar layout to page 8, with photos and text.
- Page 10:** Network Rail Engineering EEM 6th... The afternoon meeting was kindly hosted by Richard... Network Rail Engineering EEM 6th... Network Rail Engineering EEM 6th... Network Rail Engineering EEM 6th...
- Page 11:** Similar layout to page 10, with photos and text.
- Page 12:** Similar layout to page 10, with photos and text.

# Top tips for establishing a local partnership with other schools to spread best practice

The collage displays 12 newsletters and 2 planning posters. The newsletters are titled 'Newsletter Half term 1 2018-2019' through 'Newsletter Half Term 5 & 6 2018-2019'. Each newsletter contains text reports, photos of school events, charts, and lists of activities. The posters on the right side of the collage are titled 'K5 Planning' and 'K3 Planning', featuring logos for Lord Grey Academy, Ousedale School, St Paul's Catholic School, and The Radcliffe School. The bottom right corner of the collage features the logo and name of 'the Hazeley Academy'.





# Top tips for establishing a local partnership with other schools to spread best practice

The image displays a grid of 12 newsletter pages from 'ENTHUSE X STEM', numbered 1 through 6 in two rows. Each page features the 'ENTHUSE X STEM' logo at the top and contains text, photos, and graphics related to school activities and partnerships. The newsletters include sections such as 'Newsletter Half term 3 & 4 2018-2019', 'Local Grey Academy', 'Western Power Distribution', and 'The Big Bang Northants'. The pages are arranged in two rows of six, with the top row numbered 1-6 and the bottom row numbered 1-6.





# Top tips for establishing a local partnership with other schools to spread best practice

The image displays six newsletters from the 'ENTHUSE STEM' partnership, numbered 1 through 6. Each newsletter contains various articles and photos related to school activities and STEM projects. Newsletter 1 includes a sidebar titled 'KS4 and 5 Moderation'. Newsletter 4 features a 'Solar Aid' logo. Newsletter 6 includes a logo for 'The Hazzeley Academy' at the bottom.



# Hosting a yearly conference to boost the skills and confidence of teachers (pre-Covid)



In 2018 St Paul's hosted a very successful launch event attended by 27 colleagues from partner schools and delivered by @TeacherToolkit AKA Ross Morrison McGill. Ross helped us to analyse the differences between male and female pupils before providing a range of tips and guidance that we can apply in our planning and teaching. All training was specifically planned to support within our D&T context.



Members of the Partnership met at the National Museum of Computing for the 2019 conference. The day was jam packed with activities.

The day started off with an inspirational talk from Dr Filomena Martina who is from the University of Cranfield. Filo is a Senior Lecturer in Additive Manufacturing at the Welding Engineering and Laser Processing Centre. He shared some fascinating developments in his field, including metal 3D printing, his work in aerospace and for the ISS.





## Year 2

Presenting our progress to others within the partnership to demonstrate the impact



All the presentations were full of the positive impact that the Enthuse Partnership has had in every school. To summarise points:

- Improving opportunities of STEM events within schools for learners
- Improving STEM curiosity of our students
- Embedding key skills and knowledge in KS3, making solid foundations for KS4
- Aiding with strategies for assessment and feedback
- Building upon strategies for knowledge recall
- Improving the profile within schools and with SLT
- Staff taking ownership of CPD and taking advantage of the opportunities made available
- Increased number of trips and visits
- More understanding for both staff and students of industry
- Using positive praise to encourage learners
- Utilising funding effectively (including PP)
- Aiding with change of course and staffing
- Presenting appropriate challenges for staff and students
- Driving Faculty led CPD
- Supporting with planning for options
- Driving interventions and subsequent improved outcomes
- Using ex-students as subject ambassadors
- Raising the D&T profile with clubs and extra curricular activities
- Celebrating success
- Improving and building a higher level of parental involvement
- Teachers' own subject knowledge; improving and building confidence
- Building a community between the schools
- Support with understanding the new GCSE Specification
- Improving A-Level retention

# Providing targeted training for Design and Technology teachers to improve their pedagogy



Airineers and Fusion 360 training for 11 partnership colleagues. Delegates learnt about Fusion 360 with a view to providing pupils access to this free and powerful piece of CAD software on day one. On day two delegates learnt how to apply their new skills in Fusion 360 to designing and 3D printing a small racing drone. Partnership schools will be recruiting pupils to take part in Airineers



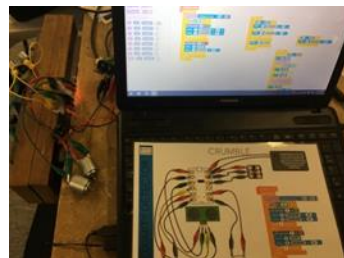


# Providing targeted training for Design and Technology teachers to improve their pedagogy



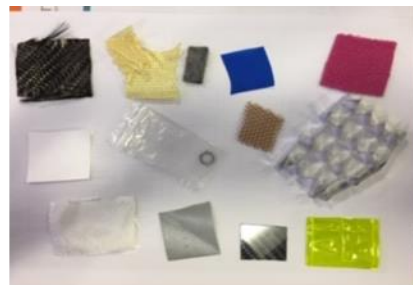


## Free CPD for teachers through the STEM York Centre



### Crumble and Smart Materials.

Megan in Lord Grey made changes to the Year 8 Scheme of Learning in order to better include Systems and Control and improve the theory delivered to cover a wider range of materials.



### Smart Materials and Technical Textiles course at Airbus in Stevenage.

Invaluable information and advice for effective delivery of this aspect of the specifications for both GCSE and A Level was shared with practical example tasks and sample materials. The venue was in the Airbus Discovery Centre where the Mars Testing Valley is used for the Mars rover vehicles.





## Feedback from 'Champions' after year one

### Impact:

The Champions met @ St Pauls School at the end of Year One, one of their topics up for discussion was 'what is has the impact been so far?', these are some of the points that were raised.:

- \* Staff happiness and wellbeing has been supported through the work done through the ENTHUSE partnership.
- \* A renewed and restored faith in teacher professionalism.
- \* Encouraging and supporting more regular reflection and professional dialogue in departments; now on a daily basis.
- \* Teachers are more confident, in particular with regard to subject knowledge and feel this is increasingly more up to date.
- \* Teachers feel inspired and enthused.
- \* Mark, Plan, Teach and knowledge gained from the conference, is being experimented with used in schools.
- \* Teachers remark that they are coming out of their normal routines and trying things and taking risks.
- \* Champions remarked that department colleagues feel empowered and that leadership is increasingly distributed.
- \* It was remarked that the work being done via the partnership is supporting increased capitation and investment in school.
- \* Teachers and pupils are increasingly less driven by outcomes and more so by the process (of teaching or designing).



# Impact of the partnership and the evidence it was working



It is all about the students!

How what the teachers learnt was then transferred into our lessons.





# Impact of the partnership and the evidence it is working

Character Confidence Creativity Community Contribution





# Impact of the partnership and evidence it is working: Trips, Visits and competitions

**MKCITIZEN**

Business standards company in Milton Keynes hosts STEM event for students







**ENTHUSE**  
Celebration Awards  
2020



[2020 ENTHUSE Celebration Awards:  
the winners | Tes Magazine](#)

## *What has been the impact of the funded partnership?*

### **For pupils**

- Greater opportunities in and out of the D&T classroom across 6 schools
- Improving outcomes and initial evidence of a narrowing gender gap

### **For teachers**

- Access to a powerful, developmental support network
- Increasing agency and growing leadership capacity
- Access to the CPD we say we need, not just the CPD we are directed to

**MK D&T ENTHUSE**  
**Partnership** 

## *Best bits*

- The support network across schools
- The agency to commission CPD, as a partnership, and owning our own professional development
- The growth in the capacity of leaders at all levels across the partnership
- Achieving buy in from key stakeholders, such as SLT and the Local Authority
- Amazing cost to impact ratio
- Creating a team across schools

**MK D&T ENTHUSE**  
**Partnership** 



**ENTHUSE**  
Celebration Awards  
2020

## Top Tips

- Build strong relationships between the Lead, Deputy Lead and School Champions
- Publish a regular newsletter and share it widely
- Plans and reports need to be clear, functional and adaptable; remember no plan ever has been enacted how it was “supposed to be”
- Plans fail on implementation; it’s worth spending some time reading “Putting Evidence To Work: A School’s Guide To Implementation” by the EEF
- Have cake!



## What’s next for our partnership?

- Continue to welcome in any schools who wish to take part
- Build links with primary schools and make sure they are supported to deliver a relevant D&T curriculum
- Sustain the partnership without the formal funding by building on established relationships
- Strategically engage with local employers and industry

