

## Evidence on different STEM Learning CPD modalities

### Summary

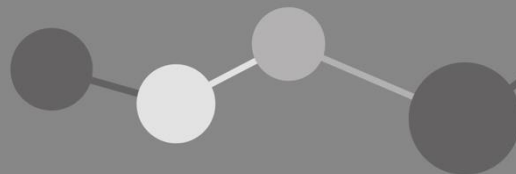
Over time, STEM Learning has accumulated a significant evidence base on the impact face-to-face CPD has on teachers, students and schools. This is broken down by programme, with specific comparisons between face-to-face CPD delivered at the National Centre (ENTHUSE) or via the Network of Science Learning Partnerships, and Online (asynchronous) CPD. Due to its more recent introduction (Spring 2020), we have reach and evaluation data for remotely delivered (online synchronous) CPD. However, it is currently too early for significant impact evidence to be available.

Initial conclusions - at this stage.

- ➔ Qualitative and quantitative evidence shows that STEM Learning CPD is **highly impactful** for students, teachers and schools.
- ➔ **Face-to-face CPD is the most impactful** approach to delivering CPD, with quantitative evidence demonstrating proven impacts on **teacher retention**, **student attainment** at KS2 and GCSE, and **student progression** from GCSE to A levels.
- ➔ Face-to-face, intensive (often residential CPD) at York and that provided more locally through Science Learning Partnerships **serve different subsets of teaching professionals**, with intensive CPD often attracting those most in need of support or in leadership positions for science within their institutions.
- ➔ The impact of each programme differs, with **intensive CPD at York being consistently shown as highly impactful across a broad range of aspects (leadership, subject knowledge, practical skills etc)**, and that provided by **SLPs being more directed and targeted** at specific areas.
- ➔ Together, the York, SLP and on-line programme provide a **complementary offer of support**, with the key engagement barriers to one programme being addressed by another.
- ➔ **Further evidence** on the quality and impact of different CPD modalities and STEM Learning programmes will be available in the coming months.

Further detail on existing evidence and emerging information is given in the Appendices.

STEM Learning, July 2020.



## Appendix 1

### Summary of recent impact evidence for Face-to-face CPD

See the SL [Impact and Evaluation website](#) for latest findings.

#### [Economic Impact on Teacher Retention](#)

- ➔ Teachers engaging with STEM Learning CPD are **160% (190% for NQTs) more likely to remain in the profession** after 2 years, compared to similar non-engaged teachers.
- ➔ STEM Learning CPD has **saved the UK at least £58.5m in teacher training costs, a return on investment of 153%.**

#### [Impact on GCSE Science](#)

- ➔ Schools engaging with STEM Learning science CPD saw an **increase of more than 10%** in the proportion of students achieving Ebacc two sciences, more than double the progress of non-engaged schools.

#### [Impact on science in primary schools](#)

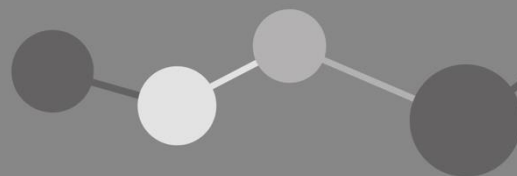
- ➔ Primary schools where teachers had recently engaged with STEM Learning CPD improve their results around **50% faster than non-engaged schools.**

#### [KS4 to KS5 progression \(SLPN KPI\)](#)

- ➔ The proportion of female students progressing to take STEM A levels is **12.8% higher for schools engaged with SLPN science CPD** compared with non-engaged schools.

#### [ENTHUSE Partnerships; ENTHUSE and Lloyds Register Foundation funded](#)

- ➔ **Increases in STEM attainment**, with 90% of girls and 77% of boys now meeting or exceeding expectations, up from 83% and 74% respectively. Similarly, 69% of pupil premium students are meeting or exceeding expectations, up from 61%.
- ➔ **Increased aspirations**, with approx. 15,000 additional students wanting a career in STEM.



## Appendix 2

### Comparative Analysis of STEM Learning CPD delivery modes

STEM Learning commissioned a comparative analysis by Qa Research, to understand patterns of behavioural engagement and relative impacts of CPD offered by ENTHUSE science, SLPN and Online asynchronous (FutureLearn). This analysis focused on the 3-year period between 1<sup>st</sup> September 2016 to 31<sup>st</sup> August 2019. Note that tiered bursaries for ENTHUSE were implemented from September 2018.

#### Summary of key findings:

- ➔ The ENTHUSE science programme, SLPN programme and Online asynchronous programme **support different audiences** (see below).
- ➔ The programmes lead to **complementary impacts**, reported by a sample of participants (see below).
- ➔ All three programmes have specific value and impacts for the teaching population, their schools and the young people they teach.

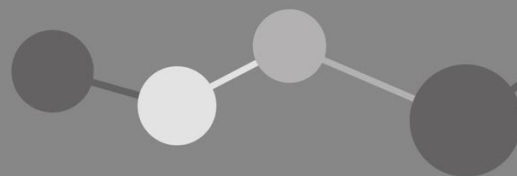
#### Characteristics of CPD participants

The data below is based on analysis of engagement patterns over three academic years. Participant engagement data was matched by school to data from the DfE's 'Get Information About Schools' database; except those characteristics marked with an asterisk (\*), which are taken from the follow-up survey and depth interviews.

- ➔ **ENTHUSE programme** engages less experienced or non-specialist teachers and technicians from deprived areas<sup>1</sup>, leading to very high impact.
- ➔ **SLPN programme** engages more experienced teachers and leaders, reaching all areas of the country, leading to high impact.
- ➔ **Online programme** engages more experienced teachers and technicians, who are less likely to have previously engaged with ENTHUSE and SLPN, spread across the UK, and is less impactful than ENTHUSE and SLPN.

ENTHUSE science	SLPN	Online
Primary & Secondary	Primary & Secondary	Secondary
Teachers and Techs	Teachers, Heads of Dept	Teachers and Techs
Less experienced*	More experienced*	More experienced*
Close to York	Further away from York	Further away from York

<sup>1</sup> This pattern is consistent across the years of interest; however the 2018/19 period includes tiered bursaries that make ENTHUSE more attractive to those schools most in need.



ENTHUSE science	SLPN	Online
Engage with other CPD modalities	Tend to engage with SLPN only	Tend to engage with Online only
High engagement (all modalities)	High engagement with SLPN	Lower engagement
Very high impact	High impact	Lower impact
More likely to be from deprived areas	Widely spread	More likely to live further afield of York
Highly likely to cascade knowledge	Highly likely to cascade knowledge	Less likely to cascade knowledge
More likely to 'proactively' book CPD*	More likely to 'reactively' book CPD (e.g. because of Ofsted inspection)*	Preference for one-way learning*

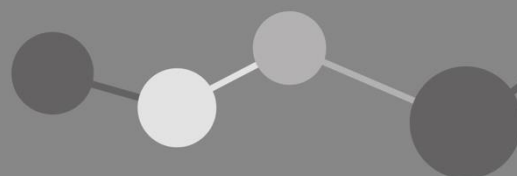
### Differential Impact of CPD modalities

A sample of approximately 2,200 participants engaged with ENTHUSE science, SLPN and online CPD responded to a survey on the relative impacts of each programme.

- ➔ **ENTHUSE Programme** has consistently higher impacts on participants, schools and students than SLPN and Online.
- ➔ **SLPN Programme** is more directed in content and delivery and has high impact in specific areas (see **pink** numbers in table below).
- ➔ **Online CPD programme** has a far greater reach, but somewhat lower impact compared to ENTHUSE and SLPN.

Impact on Self	ENTHUSE	SLPN	Online
Improved knowledge of my STEM subject and pedagogical understanding	97%	92%	85%
Enhanced understanding of how to contextualize STEM education with cutting edge knowledge, employability skills and careers information	87%	74%	60%
Now have more confidence, motivation and enthusiasm for teaching STEM subjects	96%	91%	71%
Improved competence and quality of leading, teaching or supporting STEM subjects	97%	95%	80%
More prospects for career progression and motivation to stay in the education profession	80%	68%	50%
Developed skills to deliver CPD	87%	82%	64%

Impact on school	ENTHUSE	SLPN	Online
Enhanced quality of teaching STEM subjects	96%	93%	75%
Higher profile/priority of STEM subjects	87%	78%	59%



Greater progress and/or attainment of students taught by colleagues	88%	84%	60%
Increased uptake of students studying STEM subjects pre and post-16	67%	59%	41%
Better quality of leadership in relevant STEM subjects	84%	82%	54%
More STEM enrichment and enhancement	92%	85%	65%

Impact on students	ENTHUSE	SLPN	Online
Greater progress and/or attainment in STEM subjects	89%	87%	68%
Increased motivation and engagement in lessons	93%	90%	73%
Higher aspirations to continue with STEM education and careers	86%	80%	59%
Better behaviour and safe working	85%	72%	51%
Increased employability and practical skills	82%	77%	59%

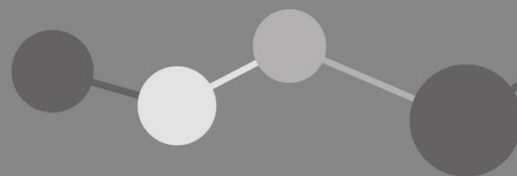
### Barriers to engagement

The same 2,200 participants as above were asked what the key barriers to engaging with a different CPD programme were.

- ➔ Travelling to York and cost<sup>2</sup> was a key barrier for the **ENTHUSE Programme**, however the content and range of support was not an issue.
- ➔ Specific courses not being run at a local SLP, and awareness were the biggest barriers to engaging with the **SLPN Programme**, however this still only represent a quarter of respondents.
- ➔ Awareness and time were the key barriers to engaging with **Online CPD**, with qualitative evidence showing that teachers are unlikely to be able to undertake online course in school time.

ENTHUSE Science Programme (N = 520)	
Course was in York	48%
My school did not have the budget	35%
Could not do these courses due to commitments outside of work	21%
I did not have time	19%
I could not get cover	18%
Courses were not at times convenient for me	15%
Unaware this was an option	12%

<sup>2</sup> Cost refers to the total cost of attending CPD (including travel costs, supply cover), not just the course fee, which is subject to bursary.



Couldn't find course relevant to my needs	9%
Couldn't find courses that interested me	2%
Other	6%

#### Network of Science Learning Partnerships (N = 216)

There were no courses in my area	27%
Unaware this was an option	26%
My school did not have the budget	19%
Couldn't find course relevant to my needs	19%
I did not have time	13%
I could not get cover	13%
Couldn't find courses that interested me	11%
Courses were not at times convenient for me	11%
Could not do these courses due to commitments outside of work	9%
Other	7%

#### Online CPD (N = 481)

Unaware this was an option	37%
I did not have time	31%
Couldn't find course relevant to my needs	16%
Could not do these courses due to commitments outside of work	11%
Couldn't find courses that interested me	9%
My school did not have the budget	6%
Courses were not at times convenient for me	6%
I could not get cover	2%
Other	7%