London Schools Excellence Fund

Self-Evaluation Toolkit

Final report

Contact Details

educationprogramme@london.gov.uk

Evaluation Final Report Template

Introduction

The London Schools Excellence Fund (LSEF) is based on the hypothesis that investing in teaching, subject knowledge and subject-specific teaching methods and pedagogy will lead to improved outcomes for pupils in terms of attainment, subject participation and aspiration. The GLA is supporting London schools to continue to be the best in the country, with the best teachers and securing the best results for young Londoners. The evaluation will gather information on the impact of the Fund on teachers, students and the wider system.

This report is designed for you to demonstrate the impact of your project on teachers, pupils and the wider school system and reflect on lessons learnt. It allows you to highlight the strengths and weaknesses of your project methodology and could be used to secure future funding to sustain the project from other sources. All final reports will feed into the programme wide meta-evaluation of the LSEF being undertaken by SQW. Please read in conjunction with Project Oracle's **'Guidance to completing the Evaluation Final Report'**.

Project Oracle: Level 2
Report Submission Deadline: Round 1 and Round 2 - 30 September 2015
Report Submission: Final Report to the GLA

Project Name: London STEM leaders
Lead Delivery Organisation: Teach Design
London Schools Excellence Fund Reference:
Author of the Self-Evaluation: Manjinder Sangha / Phil Holton
Total LSEF grant funding for project: £130,000
Total Lifetime cost of the project (inc. match funding):
Actual Project Start Date: June 2013
Actual Project End Date: July 2015

1. Executive Summary

This report details an intervention called the London STEM Leaders project. Details of the project content, delivery partners and evaluation methods have been described in this report. In addition to this the limitations of the project, and its evaluation have been discussed with suggestions upon how to improve and sustain the intervention itself.

The project London STEM leaders was developed to align with the LSEF aims and the ethos of Teach Design. The project was centred around enabling teachers from London to develop their knowledge skills and learning around the area of robotics and computer programming. The project launched new curriculum materials provided CPD and ongoing support to 40 schools. The teachers were then to run an extracurricular club to engage students into the Vex IQ competitions. In January 2015, during two organised events, school teams brought teams and robot outcomes from their clubs to the host school (Highgate School, North London), to take part in a regional VEX IQ competition, one of many regional events run throughout Spring, leading to a prize, a place in the national competition held at the Big Bang Fair, in London in March. The intention of the programme was to create motivation and engagement into robotics from staff and students alike.

The delivery and programme ran extremely well and was derived a success. All teachers from 40 schools attended the training events. A website was launched to provide opportunity to share resources and skill sets. An additional two schools who had their own equipment joined the programme taking the number of engaged schools to 42, though these did not receive funded equipment gifted to them. For the sake of data comparison, the report focus is on the 40 schools involved and funded by the programme. 17 out of these 40 schools engaged in the blog space to share resources and thought. It was reported through online surveys and interviews 64% of teachers felt more confident in their teaching of robotics than before the programme had been in place, opposed to 38% originally were confident in their abilities. There was a 59% rise in the sharing of resources across curricular areas. And 66.7% of the teachers involved in the project felt happier and more comfortable in their teaching.

91% of the students were interested in robotics post programme and the 90% of the schools that received training entered the Vex IQ competition. With 18 teams registering for next year's competitions to date.

The project ran on schedule and provided value for money. The key evaluation methods used were online surveys and interviews. It has been deemed necessary to redesign elements of data collection to ensure engagement from its audience and further recommendations for creating a sustainable future for this project have been suggested such as to ensure a greater impact to the disadvantaged schools; i.e; a method of screening or entry requirement is proposed as well as agreement to be involved in the evaluation process.

2. Project Description

Teach Design Ltd is a non for profit organisation with an ethos of for teachers, by teachers. The company is run by a group of current active teachers, working in STEM subjects as subject (middle) leaders. The London STEM leaders programme was developed in response to a shortage of true STEM based cross curricular provision in primary and secondary schools in London and the wider UK education system. The project aims to provide teachers, the nominated STEM leaders, with training, support, the provision of equipment and a forum for sharing and discussing ideas. Through face to face training, an online website and supporting blog, and through sharing best practice within school

networks, the programme targets to train a London STEM leader at each of the selected schools, spread across as many boroughs as possible.

With the launch of the new curriculums for 2014 implementation, many subject teachers delivering technology focused learning have found difficulty in preparing to teach autonomous robotics, programming, biomimicry and iterative design (to name a few new areas of learning) and still deliver engaging build and design tasks. If staff then attempt to integrate modern computer aided design and manufacture opportunities, the collective enhancement of curriculum offer proposes to be a large shift away from the traditional design and technology curriculum offer already well-established in schools. The changes to the curriculum require KS1-2 students to build and construct a product, but without further constraints. At KS3 and upwards, the introduction of programming, complex areas of design exploration, and the use of control systems for autonomous products naturally offers itself to the use of education based robotics kits and platforms.

During a launch event towards the end of the 2013-2014 academic year, the aim of the project was to invite school representatives to attend a face to face session, introducing the platform, VEX IQ, a plastic based but highly intelligent system. During training, teachers will build a robot, programming it using a “scratch” style programme called Modkit, and learn about the wide variety of curriculum materials, competitions and opportunities the VEX IQ platform provides. Each school then took away from the session sufficient equipment, gifted to the school, to set up a VEX IQ STEM club during the Autumn term 2014. During this period, schools invited a range of students aged 11-14 to attend the club on a weekly basis. Teams of 5 students will build a robot for the national competition (Highgate), totalling three teams.

During a recap event hosted in the Autumn term of 2014, staff were invited to return to the host school, Highgate School North London, to touch base and iron out any concerns over the operation of the STEM club, and introduce the available curriculum materials for VEX IQ, a 12 lesson project integrating science, mathematics and technology into a single focused series of lessons for KS2 or 3. Schools were then left to develop their club, deliver their new offer, all the while conversing between partner schools, the host school, and sharing experiences on an online blog hosted on a dedicated website www.londonstemleaders.co.uk

In January 2015, during two organised events, school teams brought teams and robot outcomes from their clubs to the host school, to take part in a regional VEX IQ competition, one of many regional events run throughout Spring, leading to a prize, a place in the national competition held at the Big Bang Fair, in London in March. The two competition days gave clubs a focus, provided staff and students with an incentive to work towards, and ensure that outcomes and students ability can be observed during these days. During the summer of 2015, networking events at the end of the academic year would have brought the now established London STEM Leaders together with untrained and inexperienced staff from their school or partner schools, and provided a whole day where staff can train their peers, ensuring the sustained delivery of the club, and potentially the new curriculum that schools may introduce into their school planning. At the end of the programme, staff and student numbers are expected to be high, and sustained interest in the activities of the programme after the programme ends officially will be enough to leave a legacy of trained individuals who can lead into the future these STEM activities. Unfortunately this event had to be cancelled due to unforeseen circumstances.

The host school, Highgate School in North London, acted as host school for all training, support and on the ground activity. Jon Taylor and Andy Thompson, current teachers of the D&T curriculum at the school, acted as contacts for all school based support. Steve Parkinson and Phil Holton, Teach Design directors, were the coordinators for the programme, and organised the reporting of the

programme and funding distribution. Administrators Aimee Holton and Lindsay Parkinson helped to organise equipment orders, printing and marketing distribution, background market research and recording of data, and effectively concern themselves with all the day to day activities of the programme including events, registration of schools. During the programme the evaluation was handed over to Manjinder Sangha who collated the missing information from the interim report and from January 2015 was helping to gather the information about from the data collection methods described later.

Whilst the project aimed to work with all variety of schools ranging from primary schools with diverse intake or failing teaching and learning, through to excelling and outstanding secondary schools. The strengths and diversity of the schools involved hoped to build stronger networks and hubs between schools that may never work together, or strengthen those primary schools already acting as feeder schools to local secondary schools. Across the curriculum, the equipment offer and new curriculum materials were aimed at supporting upper KS2 and lower KS3 students, potentially during transition between schools, or for those identified as gifted and talented, or simply those keen to engage with STEM based learning. This opportunity was aimed for school and leader of that school to decide, so that they can make a provision based on the demographic of their own school.

2.2

As part of the programme there was expectation that additional resources would be developed to support the ongoing impact of the programme in schools within the London Schools hub and beyond. During the project lifetime, Teach Design developed a unique bank of robotics based STEM lessons for VEX IQ, and doubled the number of VEX Robotics materials to include 2 six week projects focused on CAD/CAM in robotics, and a 12 week project based on industrial robotics in conjunction with Fanuc. These materials have been passed onto Innovation First, the project partner, and will be hosted live on the VEX robotics website (UK only) from January 2016. Materials are free to download in conjunction with any robotics programme, and are suited to both primary and secondary school STEM clubs, KS3 design and technology, and KS4 or KS5 Product Design qualifications. Ongoing development will also see the production of focused Units of study for Btec Engineering, which will see completion in June 2016.

2. 3 Post project summary
Looking forward, if the project were to gain additional funding at a later stage, additional information would be gathered to support the evaluation process. This would include informal observations accrediting staff for levels of competence in being a STEM leader in schools, and using impact data on students taught to validate this improved situation for London students. Greater commitment would also be made to validate more of the perceptions and attitudes to the project and its outcomes, for both teachers and students.

3. Theory of Change and Evaluation Methodology

Theory of Change and Evaluation Framework.

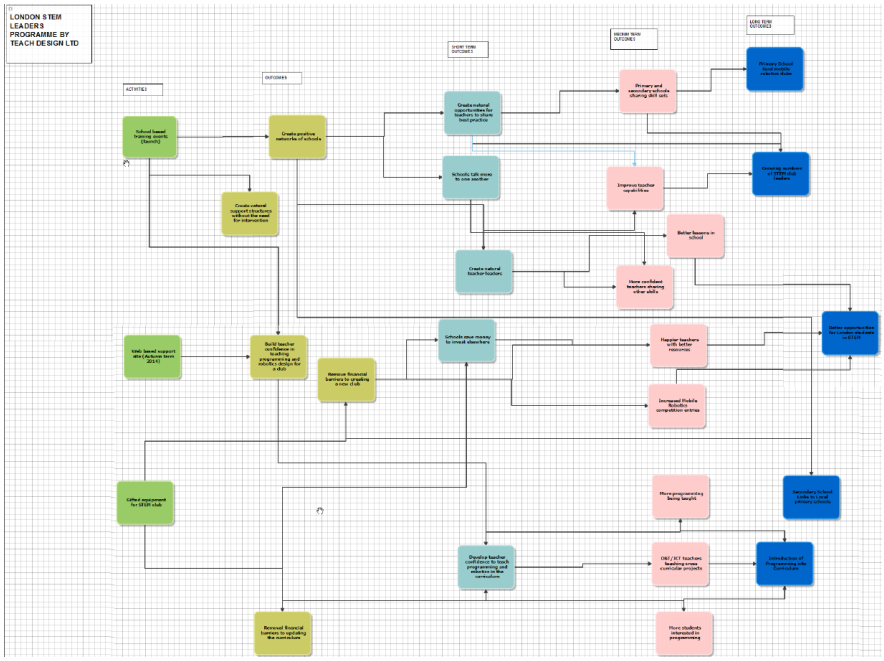


Figure 3.1 Theory of Change (agreed on the 10th August 2014)

3.1

Table 1- Outcomes

Description	Original Target Outcomes	Revised Target Outcomes	Reason for change
Teacher Outcome 1	• Increased teacher confidence	n/a	n/a
Teacher Outcome 2	• Heightened long term ambition	n/a	n/a
Teacher Outcome 3	• Use of better subject-specific resources	n/a	n/a
Teacher Outcome 4	• Teachers involved in intervention making greater use of networks, other schools and colleagues to improve subject knowledge and teaching practice	n/a	n/a
Wider School System Outcome 1	• Schools involved in intervention making greater use of networks to improve the subject knowledge and teaching practice of their staff	n/a	n/a
Wider School System Outcome 2	• Programme activities/ model is embedded in department/ schools/ council planning beyond the intervention group	n/a	n/a

Wider School System Outcome 3	• Use of new resources by teachers/ schools outside the intervention group	n/a	n/a

3.2 No changes were made to the Theory of Change once it was validated.

3.3 Did you change your curriculum subject/s focus or key stage? The programme was initially aimed at Primary and secondary schools however all the schools involved were secondary however the students participating were KS3.

3.4 Did you evaluate your project in the way you had originally planned to, as reflected in your validated evaluation plan?

Originally it was intended that Pre intervention surveys were to be carried out by staff alone but it was deemed necessary for students be involved to observe the impact on their thoughts and aspirations. The pre intervention survey was completed later than that of staff and 100% of the student cohort participated. This is a large enough sample but it is important to bear in mind that the survey was administered after the intervention had begun. This may have had an impact on the perceptions of students and may misrepresent information in the results.

In addition to this the observations that were to be carried out by the individual departments were not returned by any school therefore there is no data to validate that aspect of the Theory of Change.

Lastly it was not initially planned to explore data relating to pupil outcomes in considerable depth, but given the nature of the intervention, it was judged that pupil outcomes would prove a beneficial avenue for measuring impact, in areas such as retention to the club, the selection of options for GCSE, and perceptions of STEM an programming prior the project launch. The data required to conduct such comparison would require increased participation by schools and staff, and this was not at this stage considered to be a major barrier for this to take place.

4. Evaluation Methodological Limitations

4.1 What are the main methodological limitations, if any, of your evaluation?

The main methodological limitations have been due to lack of response to the post interventions surveys but we have tried to tackle this by conducting more interviews with the teachers involved in the programme. 62% of teachers engaged in the post intervention surveys however 75% of the teachers engaged in face to face or telephone interviews.

The pre intervention surveys have been carried out at different points of the process, some in July 2014 others in the autumn termm 2014 and the latest ones in the beginning of 2015. The data being collected at different points obviously adds to the uncertainty of the results and even though we can draw some conclusions about the starting points of teachers and students, their perceptions of the activities and their confidence will have altered during the training stages and implementation stages.

Another area that has caused some ambiguity is the observations that were designed to understand how the intervention had impacted long term and how the teachers were using the resources and learning strategies in their lessons every day. The observations were sent through however not returned by staff/HoDs. Having this data missing makes it difficult to attribute any long term change in the teachers. However the numbers of teachers training others to run the programme has been obtained from future sign up numbers and also from the interview data.

In turn the interview data is heavily reliant on the skills of the researcher and can be biased by the researcher's personal bias idiosyncrasies. Also the findings can be more difficult and time consuming to characterize in a visual way. It was found that the interviews were very valuable in obtaining qualitative data and have been a good method to triangulate other evidence.

Another limitation that is necessary to mention is when the schools were invited to take part in the programme there was no real indication given to them how much involvement would be needed in the evaluation process and also the initial parts of the evaluation were carried out by different members of the team so there is some disparity in what has been achieved due to the hand over and lack of data in some parts. The team has endeavoured to rectify and obtain data even throughout the summer 2015 however there was really little response once the competitions had finished.

4.2 Are you planning to continue with the project, once this round of funding finishes? Yes

If **yes**, will you (and how will you) evaluate impact going forward?
If the project gains the next stage of funding there is a lot of information and learning that has taken place during this stage that will inevitably impact the way the programme has been evaluated and run. The initial baseline data and the way the impact is assessed would need to be redesigned to ensure that there is greater engagement to the evaluation process. However this would greatly be dependant of the amount of funding that was available.
Considerations have been made subsequently that much of the ongoing impact of the project will take place in the 2nd, 3rd and 4th years after the equipment has been used and embedded into the curriculum plans. Key impact data reflecting on the "what happened next" stage for each school would provide an argument to justify not only the investment into the project to make an impact into how schools perceive STEM and how they engage with it, but also have perceptions and attitudes have changed in taking the equipment and the learning beyond the programme and embedded into how the school approaches STEM education.

5. Project Costs and Funding

Table 2 - Project Income

	Original[1] Budget	Additional Funding	Revised Budget [Original + any Additional Funding]	Actual Spend	Variance [Revised budget – Actual]
Total LSEF Funding	75,000	43,000	118,000	118,000	0
Other Public Funding	0	0	0	0	0
Other Private Funding	12,000	0	12,000	12,000	0
In-kind support (e.g. by schools)	0	0	0	0	0
Total Project Funding	87,000	43,000	130,000	130,000	0

List details in-kind support below and estimate value.

Table 3 - Project Expenditure

	Original Budget	Additional Funding	Revised Budget [Original + any Additional Funding]	Actual Spend	Variance Revised budget – Actual]
Direct Staff Costs (salaries/on costs)	18,000	12,000	30,000	30,000	0
Direct delivery costs e.g. consultants/HE (specify)	0	0	0	0	0
Management and Administration Costs	0	3,000	3,000	3,000	0
Training Costs	7000	3,000	10,0000	10,000	0
Participant Costs (e.g. Expenses for travelling to venues, etc.)	0	0	0	0	0
Publicity and Marketing Costs	23000	8,000	31,000	31,000	0
Teacher Supply / Cover Costs	0	0	0	0	0
Other Participant Costs	0	0	0	0	0
Evaluation Costs	5000	2,000	7,000	7,000	0
Others as Required – Please detail in full} Gifted Equipment	22000	15,000	37,000	37,000	0
Total Costs	75,000	43,000	118,000	118,000	0

5.2

The budget was applied according to the budget plan, with slight movements of small amounts of funding between areas, but no major deviation from this plan. The gifted equipment for the funded and additional funding was an initial issue, as the robotics kits purchased for the initial schools was

[1] Please refer to the budget in your grant agreement

delivered with a committed discount from the supplier. However due to extra demand for product during the additional funding stage, where Teach Design attempted to purchase the same number of kits for the new schools, this was not possible. Negotiation resulted in variations of the equipment provided in the 2nd group, without impacting on the potential to set up the club nor compete in the competition. Trainer funding was slightly increased in response to the additional work being conducted by the teacher trainers during data collection. However marketing, evaluation costs and staff costs came on target. Upon review of the marketing budget, the Teach Design magazine had managed to sell additional advertising space in two of the magazines during the programme, which resulted in £1200.00 being used to produce and provide schools with free robotics posters and drawing tools, and increase the production of the magazine to include additional demand in London schools and being sent to higher education providers. Whilst evaluation costs for outsourcing the data collection and analysis came in on budget, the cost of sending out marketing materials and data collection tools meant that funds from other areas (nominal amounts) were moved across. In summary, funding was carefully set to the budget proposed, and on reflection Teach Design would have appreciated moving larger amounts of funding to the collection of additional data to support the final report.

6. Project Outputs

Table 4 – Outputs

Description	Original Target Outputs	Revised Target Outputs *[Original + any Additional Funding/GLA agreed reduction]*	Actual Outputs	Variance [Revised Target - Actual]
No. of schools	20	40	40 (1 from additional 2 schools)	+1
No. of teachers	20	120	40	-80
No. of pupils	80	550	130	-420

Please note that the above data "revised target outputs" are these expected number of schools, teachers and pupils benefiting from the programme impact, but our actual outputs are the number of physical schools, teachers and pupils we managed to gather data from. We therefore have outlined in the actual outputs that all 40 schools were involved in the programme as confirmed by the attendance and contribution to the competitions, but only 40 teachers, those who attended the events and training, were possible to collate data from. The additional 80 teachers, which represents the further teachers/technicians from each school, did not provide contribution to the data collection, and we have therefore not included them in the actual outputs (as we do not have physical data from them). This is the same approach with the pupil numbers. Whilst clubs ran with up to 15 students at each school (an estimated 600), we were only able to collect data from those students who attended the competition, which for each school was between 3 and 5 . We therefore have data from 130 students who attended the competition dates, but are aware that 550 students benefited from the programme, but 420 students had no data gathered on their experiences. This inclusion of only the 130 students was due to the competition funding (included in the free gifted equipment to the schools) was only planned to cover one team entry to the competition, and it was at these events that data was mainly gathered as part of the attendance pack students engaged with. If the programme were able to plan better for data collection, it would have provided competition places to all three teams per school, which would have provided data collection opportunities for all students who engaged with the project.

7. Key Beneficiary Data

7.1 Teacher Sub-Groups (teachers directly benefitting counted once during the project)

There were forty schools involved in the programme therefore there were forty teachers trained directly on the CPD programme provided. However unplanned in the programme was cases where schools sent additional staff to these initial events, which were attended by more than one teacher per school. The evaluation data and collation of information on the schools at these events took in only the 40 planned attending teachers, and not those attending additional to the one per school requirement of the programme. In many cases more than two teacher attended the event and also during the interviews 66.7% of the participants claimed to have either shown or trained other teachers within the department. However there were four schools that attended training therefore were impacted during that but had little or no involvement during the programme due to staff changes and issues with delivery within a rigid curriculum format. Because they did not participate in any of the data collection we have not been taken these into account in the following analysis.

Table 5 – Teachers benefitting from the programme

	No. teachers	**% NQTs** ***(in their 1st year of teaching when they became involved)***	**% Teaching 2 – 3 yrs** ***(in their 2nd and 3rd years of teaching when they became involved)***	**% Teaching 4 yrs +** ***(teaching over 4 years when they became involved)***	**% Primary (KS1 & 2)**	**% Secondary (KS3 - 5)**
Project Total	36	15%	45%	40%	0%	100%
School 1	*1*	2.78%	*0%*	*0%*	*0%*	*0%*
School 2	*1*	*0%*	2.78%	*0%*	*0%*	*0%*
School 3	*1*	2.78%	*0%*	*0%*	*0%*	*0%*
School 4	*1*	*0%*	2.78%	*0%*	*0%*	*0%*
School 5	1	*0%*	2.78%	*0%*	*0%*	*0%*
School 6	1	*0%*	*0%*	2.78%	*0%*	*0%*
School 7	1	*0%*	2.78%	*0%*	*0%*	*0%*
School 8	1	*0%*	2.78%	*0%*	*0%*	*0%*
School 9	1	*0%*	*0%*	2.78%	*0%*	*0%*
School 10	1	2.78%	*0%*	*0%*	*0%*	*0%*
School 11	1	*0%*	2.78%	*0%*	*0%*	*0%*
School 12	1	*0%*	2.78%	*0%*	*0%*	*0%*
School 13	1	*0%*	2.78%	*0%*	*0%*	*0%*
School 14	1	*0%*	*0%*	2.78%	*0%*	*0%*
School 15	1	2.78%	*0%*	*0%*	*0%*	*0%*
School 16	1	*0%*	2.78%	*0%*	*0%*	*0%*
School 17	1	*0%*	2.78%	*0%*	*0%*	*0%*
School 18	1	*0%*	2.78%	*0%*	*0%*	*0%*
School 19	1	*0%*	*0%*	2.78%	*0%*	*0%*
School 20	1	*0%*	2.78%	*0%*	*0%*	*0%*

School 21	1	*0%*	2.78%	*0%*	*0%*	*0%*
School 22	1	*0%*	*0%*	2.78%	*0%*	*0%*
School 23	1	*0%*	*0%*	2.78%	*0%*	*0%*
School 24	1	*0%*	2.78%	*0%*	*0%*	*0%*
School 25	1	*0%*	*0%*	2.78%	*0%*	*0%*
School 26	1	*0%*	2.78%	*0%*	*0%*	*0%*
School 27	1	*0%*	2.78%	*0%*	*0%*	*0%*
School 28	1	*0%*	2.78%	*0%*	*0%*	*0%*
School 29	1	*0%*	*0%*	2.78%	*0%*	*0%*
School 30	1	*0%*	*0%*	2.78%	*0%*	*0%*
School 31	1	*0%*	*0%*	2.78%	*0%*	*0%*
School 32	1	*0%*	*0%*	2.78%	*0%*	*0%*
School 33	1	*0%*	*0%*	2.78%	*0%*	*0%*
School 34	1	*0%*	*0%*	2.78%	*0%*	*0%*
School 35	1	*0%*	*0%*	2.78%	*0%*	*0%*
School 36	1	*0%*	*0%*	2.78%	*0%*	*0%*
~~School 37~~	~~1~~	~~*0%*~~	~~2.78%~~	~~2.78%~~	~~*0%*~~	~~*0%*~~
~~School 38~~	~~1~~	~~*0%*~~	~~*0%*~~	~~2.78%~~	~~*0%*~~	~~*0%*~~
~~School 39~~	~~1~~	~~*0%*~~	~~*0%*~~	~~*0%*~~	~~*0%*~~	~~*0%*~~
~~School 40~~	~~1~~	~~*0%*~~	~~2.78%~~	~~2.78%~~	~~*0%*~~	~~*0%*~~

NB Schools 37-40 attended the initial workshop but were unable to partake in the programme data collection and the key stages of the project (the competitions dates), and therefore have not been included in the analyse and data tables.

7.1.2

It can be seen from the table above, the programme directly affected secondary teachers as aimed and 15% of these were NQTs, 45% 2-3years and 40% had 4 years + experience

7.2 Pupil Sub-Groups (these should be pupils who directly benefit from teachers trained)

The number of 550 students that benefited from the programme was derived from the feedback on attendance to STEM clubs at each school, who provided a number between 10 and 15 attendees on a regular basis. The number of 130 students that benefitted from the programme competition events has been derived from the data collection that was possible to conduct given that each school were afforded only one funded competition place, providing opportunity for only 3-5 students to attend these events and contribute to the core data collection. Following the completion of the competition events there was a drop off in the final surveys as clubs dispanded for the academic year in line with the end of the annual VEXIQ competition cycle. This cycle starts again in September each year, where schools are expected to then relaunch the clubs with their cohort of choice.

Tables 6-8 – Pupil Sub-Groups benefitting from the programme

	No. pupils	**% LAC**	**% FSM**	**% FSM last 6 yrs**	**% EAL**	**% SEN**
Project Total	*130*	*3.1%*	*6.9%*	*0%*	*1.5%*	*5.4%*
School 1	*3*	*0%*	*0%*	*0%*	*0%*	*0%*
School 2	*3*	*0.77%*	*1.5%*	*0%*	*0%*	*0%*
School 3	*2*	*0%*	*0%*	*0%*	*0%*	*0%*
School 4	*5*	*0%*	*0%*	*0%*	*0%*	*3.1%*
School 5	*2*	***0%***	*0%*	*0%*	*0%*	*0%*

School 6	*3*	*0%*	*0%*	*0%*	*0%*	*0%*
School 7	*3*	*0%*	*0%*	*0%*	*0%*	*0%*
School 8	*4*	*0%*	*0%*	*0%*	*0%*	*0%*
School 9	*4*	*0%*	*0%*	*0%*	*0%*	*0.77%*
School 10	*4*	*0%*	*0%*	*0%*	*0%*	*0%*
School 11	*5*	*0.77%*	*2.3%*	*0%*	*0.77%*	*0%*
School 12	*4*	*0%*	*0%*	*0%*	*0%*	*0%*
School 13	*4*	*0%*	*0%*	*0%*	*0%*	*0%*
School 14	*3*	*0%*	*0%*	*0%*	*0%*	*0%*
School 15	*3*	*0%*	*0%*	*0%*	*0%*	*0%*
School 16	*4*	*0%*	*0%*	*0%*	*0%*	*0%*
School 17	*6*	*0%*	*0%*	*0%*	*0%*	*0%*
School 18	*4*	*0%*	*0%*	*0%*	*0%*	*0%*
School 19	*4*	*0%*	*0%*	*0%*	*0%*	*0%*
School 20	*4*	*0%*	*0%*	*0%*	*0%*	*0.77%*
School 21	*2*	*0%*	*0%*	*0%*	*0%*	*0%*
School 22	*4*	*0%*	*0%*	*0%*	*0%*	*0%*
School 23	*4*	*0%*	*0%*	*0%*	*0%*	*0%*
School 24	*3*	*0%*	*0%*	*0%*	*0%*	*0%*
School 25	*5*	*1.5%*	*2.3%*	*0%*	*0.77%*	*0%*
School 26	*3*	*0%*	*0%*	*0%*	*0%*	*0%*
School 27	*3*	*0%*	*0%*	*0%*	*0%*	*0%*
School 28	*6*	*0%*	*0%*	*0%*	*0%*	*0%*
School 29	*3*	*0%*	*0%*	*0%*	*0%*	*0%*
School 30	*5*	*0%*	*0%*	*0%*	*0%*	*0%*
School 31	*2*	*0%*	*0%*	*0%*	*0%*	*0%*
School 32	*2*	*0%*	*0%*	*0%*	*0%*	*0%*
School 33	*4*	*0%*	*1.5%*	*0%*	*0%*	*0.77%*
School 34	*4*	*0%*	*0%*	*0%*	*0%*	*0%*
School 35	*3*	*0%*	*0%*	*0%*	*0%*	*0%*
School 36	*3*	*0%*	*0%*	*0%*	*0%*	*0%*

	No. Male pupils	**No. Female pupils**	**% Lower attaining**	**% Middle attaining**	**% Higher attaining**
Project Total	*71*	*59*			
School 1	*3*	*0*			
School 2	*3*	*0*			
School 3	*2*	*0*			
School 4	*2*	*3*			
School 5	*2*	*0*			
School 6	*3*	*0*			
School 7	*2*	*1*			
School 8	*2*	*2*			
School 9	*0*	*4*			
School 10	*4*	*0*			
School 11	*3*	*2*			
School 12	*4*	*0*			
School 13	*4*	*0*			
School 14	*3*	*0*			
School 15	*3*	*0*			

School 16	*4*	*0*			
School 17	*0*	*6*			
School 18	*0*	*4*			
School 19	*4*	*0*			
School 20	*0*	*4*			
School 21	*2*	*0*			
School 22	*4*	*0*			
School 23	*4*	*0*			
School 24	*0*	*3*			
School 25	*0*	*5*			
School 26	*3*	*0*			
School 27	*0*	*3*			
School 28	*0*	*6*			
School 29	*0*	*3*			
School 30	*2*	*3*			
School 31	*0*	*2*			
School 32	*2*	*0*			
School 33	*0*	*4*			
School 34	*4*	*0*			
School 35	*2*	*1*			
School 36	*0*	*3*			

	% Asian Indian	**% Asian Pakistani**	**% Asian Bangladeshi**	**% Asian Any Other background**	**% Black Caribbean**	**% Black African**	**% Black Any Other Background**	**% Mixed White & Black Caribbean**	**% Mixed White & Black African**	**% Mixed White & Asian**	**% Mixed Any Other Background**	**% Chinese**	**% Any other ethnic group**
Project Total	*6.2*	*4.6*	*0*	*0*	*0*	*4.6*	*0.77*	*0*	*0*	*4.6*	*0*	*0*	*6.2*
School 1	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
School 2	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
School 3	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
School 4	*0*	*0*	*0*	*0*	*0*	*0.77*	*0*	*0*	*0*	*0.77*	*0*	*0*	*2.3*
School 5	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
School 6	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
School 7	*0*	*0*	*0*	*0*	*0*	*0.77*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
School 8	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
School 9	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0.77*	*0*	*0*	*1.5*
School 10	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
School 11	*0*	*0*	*0*	*0*	*0*	*0*	*0.77*	*0*	*0*	*0*	*0*	*0*	*0*
School 12	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0.77*	*0*	*0*	*0*
School 13	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
School 14	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
School 15	*0*	*2.3*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
School 16	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
School 17	*4.6*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*

School18	*0*	*0*	*0*	*0*	*0*	*0.77*	*0*	*0*	*0*	*0.77*	*0*	*0*	*0.77*
School 19	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
School 20	*0*	*2.3*	*0*	*0*	*0*	*0.77*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
School 21	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*		*0.77*	*0*	*0*	*0*
School 22	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0.77*
School 23	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
School 24	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
School 25	*0.77*	*0*	*0*	*0*	*0*	*0.77*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
School 26	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0.77*	*0*	*0*	*0*
School 27	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
School 28	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
School 29	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
School 30	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
School 31	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0.77*
School 32	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
School 33	*0.77*	*0*	*0*	*0*	*0*	*0.77*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
School 34	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
School 35	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
School 36	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*

	% White British	**% White Irish**	**% White Traveller of Irish heritage**	**% White Gypsy/Roma**	**% White Any Other Background**
Project Total	*73*	*0*	*0*	*0*	*0*
School 1	*2.3*	*0*	*0*	*0*	*0*
School 2	*2.3*	*0*	*0*	*0*	*0*
School 3	*1.5*	*0*	*0*	*0*	*0*
School 4	*0*	*0*	*0*	*0*	*0*
School 5	*1.5*	*0*	*0*	*0*	*0*
School 6	*2.3*	*0*	*0*	*0*	*0*
School 7	*1.5*	*0*	*0*	*0*	*0*
School 8	*3*	*0*	*0*	*0*	*0*
School 9	*0.77*	*0*	*0*	*0*	*0*
School10	*3*	*0*	*0*	*0*	*0*
School 11	*3*	*0*	*0*	*0*	*0*
School 12	*3*	*0*	*0*	*0*	*0*
School 13	*3*	*0*	*0*	*0*	*0*
School 14	*2.3*	*0*	*0*	*0*	*0*
School 15	*0*	*0*	*0*	*0*	*0*

School 16	*3*	*0*	*0*	*0*	*0*
School 17	*0*	*0*	*0*	*0*	*0*
School 18	*0.77*	*0*	*0*	*0*	*0*
School 19	*3*	*0*	*0*	*0*	*0*
School 20	*0*	*0*	*0*	*0*	*0*
School 21	*0.77*	*0*	*0*	*0*	*0*
School 22	*2.3*	*0*	*0*	*0*	*0*
School 23	*3*	*0*	*0*	*0*	*0*
School 24	*2.3*	*0*	*0*	*0*	*0*
School 25	*2.3*	*0*	*0*	*0*	*0*
School 26	*1.5*	*0*	*0*	*0*	*0*
School 27	*2.3*	*0*	*0*	*0*	*0*
School28	*4.6*	*0*	*0*	*0*	*0*
School29	*2.3*	*0*	*0*	*0*	*0*
School 30	*3.9*	*0*	*0*	*0*	*0*
School 31	*0.77*	*0*	*0*	*0*	*0*
School 32	*1.5*	*0*	*0*	*0*	*0*
School 33	*1.5*	*0*	*0*	*0*	*0*
School 34	*3*	*0*	*0*	*0*	*0*
School 35	*2.3*	*0*	*0*	*0*	*0*
School 36	*2.3*	*0*	*0*	*0*	*0*

7.2.1

It can be seen from the tables above the majority of the students that benefited from the programme predominately White British at 73 % however the remaining 27% was largely made up of Asian Indian or any other ethnic minorities. Only 3.1% of students were looked after and 6.9% received FSM however 5.4% of the 130 students had some SEN needs. It can also be seen that the attainment columns are blanks and this is due to this data not having been collected on the onset of the report.

8. Project Impact

8.1 Teacher Outcomes

Date teacher intervention started: July 23rd 2014

Table 9 – Teacher Outcomes: teachers benefitting from the project

Outcome	Research method/ data collection	Sample characteristics	Metric used	1st Return and date of collection	2nd Return and date of collection	*Overall Outcomes*
Create Natural Opportunities for teachers to share best practice	*Training events/ blog*	*100% of the cohort attended the events*	*Average Number of teachers attending events correlated*	*-*	*3 events*	*The project created events focused on STEM and programming through robotics for primary and secondary schools*
Schools talk more to one another	*Training events/ blog*	*100% of the cohort attended the events*	*Average Number of teachers attending events correlated*	*-*	*3 events*	*Events and the blog provided contacts and opportunities to share ideas and collaborate*
Create Natural Teacher Leaders	*Database of teachers trained in STEM club set up using VEXIQ*	*100% retention of STEM club numbers in 2nd year*	*Total number of registered teams for the 2015/16 competition*	*TBC Data to be collated from Innovation First in March 2016*	*As previous*	*The training programme improved teacher skills sets to lead programming and robotics clubs*
Schools Save money to invest elsewhere	*Interviews*	*100% of schools agreed that money was saved from other budget pots given the gift or equipment*	*Quantified question Yes/No*	*Collected Jan 15*	*-*	*Schools were able to save money and launch a STEM club, but were not able to state how much they had saved*
Develop Teacher Confidence to teach programming and robotics in the curriculum	*Survey/interviews*	*94% of the 36 teachers responded to the initial online survey. The profile of respondents is reflective of the cohort.* *The final online survey had 62% of the cohort respond which is somewhat reduced but is*	*Mean score based on a 1-3 scale (1 – very confident, 2 – quite confident, 3 unconfident)*	*Mean Score 2.55 collected Jan 15 61.8% teachers unconfident*	*Mean score 2.14 collected July 15 36.4% teachers unconfident*	*Teacher confidence in delivery of the programming and bulld elements of the STEM clubs were good*

		still a reasonable sample. 75% of the cohort was also interviewed either face to face or over the telephone				
Primary & Secondary School Skill sharing	*Training events/ blog*	*100% of the cohort attended the events*	*Average Number of teachers attending events correlated*	*July 15*	*17/42 schools made use of the blog space* *Vex IQ resources were downloaded 102 unique times July 15*	*Events launched created natural hubs of schools supporting one another both primary and secondary*
Improved Teacher Capabilities	*Observations*	*0% of the cohort returned the observation forms*	*-*	*-*	*-*	*Teacher ability was hard to quantify without formal observations on staff*
Better lessons in school	*Observations*	*0% of the cohort returned the observation forms*	*-*	*-*	*-*	*As above*
More Confident teachers sharing other skills	*Blog entries*	*-*	*Number of blogs sharing training and information*	*July 15*	*17/42 schools made use of the blog space* *Vex IQ resources were downloaded 102 unique times July 15*	*Staff shared resources and adopted new teaching materials better than prior to the project*
Happier teachers with better resources	*Interviews online survey*	*94% of the 36 teachers responded to the initial online survey. The profile of respondents is reflective of the cohort.* *The final online survey had 62% of the cohort respond which is somewhat reduced but is still a reasonable sample. 75% of the cohort was also interviewed either face to face or over the telephone*	*Analysis and triangulatio n of the results from the interview.*	*11.1% of teachers interviewed were happy with their teaching of robotics and the resources available Jan 15*	*66.7% of teachers interviewed felt happier and more comfortable in their teaching July 15*	*Teacher confidence in STEM education rose across the cohort.*

Improved Robotics competition Entries	*Data provided by Innovation First Ltd, hosts for VEXIQ competitions*	*Schools registered at stages in the 2015-16 game independently for VEXIQ*	*Total number of registered teams for the 2015/16 competition*	*TBC Data to be collated from Innovation First in March 2016*	*n/a*	*Anticipated increase in robotics entries has been confirmed with already 12 schools reregistering this year.*
More Programming being taught	*Observations*	*0% of the cohort returned the observation forms*	*-*	*-*	*-*	*Increased programming being taught hard to quantify without formal observations on staff*
D&T/ICT teachers teaching cross curricular projects	*Interviews*	*75% of the cohort was also interviewed either face to face or over the telephone.* *Good representation of the cohort*	*Analysis of number of teachers sharing practice using Vex Robotics platform*	*7.4% of teachers were sharing resources across subject areas. Jan 15*	*66.7% teachers were sharing resources across subject areas July 15*	*Teachers perceptions of the amount of cross curricular work was that it had increased.*
More Students interested in programming	*Student uptake of ICT/Compute r Science at GCSE*	*Students taking part will not make GCSE options until April 2016*	*-*	*-*	*-*	*Hard to quantify without reliable data at the start of the project and selection of GCSE options 2 years on*
Primary school robotics clubs	*Number of clubs running during project period*	*100% of schools set up clubs using the gifted resources*	*Interview with staff at each school/blog entries/atte ndance to national competition with completed robot solution*	*100% attendance to national competition events*	*-*	*All clubs ran for the length of the project*
Growing numbers of STEM club leaders	*Increased number of registered lead teachers year on year*	*Name school representatives registered at stages in the 2015-16 game independently for VEXIQ*	*Total number of registered teams for the 2015/16 competition*	*TBC Data to be collated from Innovation First in March 2016*	*-*	*Currently not confirmed if new staff have registered for the competition this year*
Better opportunities for London schools in STEM	*Interviews*	*75% of the cohort was also interviewed either face to face or over the telephone.*	*Analysis of number of teachers sharing practice using Vex Robotics platform*	*7.4% of teachers were sharing resources across subject areas. Jan 15*	*66.7% teachers were sharing resources across subject areas July 15*	*Teachers agreed strongly that opportunities like this project were better now than before the project.*

		Good representation of the cohort				
Secondary and Primary School links	*Training events/ blog*	*100% of the cohort attended the events*	*Average Number of teachers attending events correlated*	*-*	*3 events*	*All schools attended the training and made links with local schools*
Introduction to programming into the curriculum	*Observations*	*0% of the cohort returned the observation forms*	*-*	*-*	*-*	*hard to quantify without formal observations on staff*

In the instances of data collection for surveys, interviews and observations, teachers were available for interview and to complete paper based surveys on three training event days, both of the competition days, with an interview over the phone conducted by the evaluation company following completion of the final event day. Pupil surveys were conducted remotely on many occasions, during club time or emailed direct by teachers to the students, or conducted during the competition event days where evaluation staff and Teach Design staff were able to speak directly to students engaged with the project. Each survey both staff and students required the entry of scores based on a range of questions that could be quantified with a strength of feeling towards a response.

Table 10 – Comparison data outcomes for Teachers *[if available]*

Target Outcome	Research method/ data collection	Sample characteristics	Metric used	1st Return and date of collection	2nd Return and date of collection
e.g. Increased Teacher confidence	*e.g. E-survey*	*e.g. 100 respondents from a total of 200 invites.* *The profile of respondents was broadly representative of the population as a whole.*	*e.g. Mean score based on a 1-5 scale (1 – very confident, 2 – quite confident, 3 neither confident nor unconfident, 4 - quite unconfident, 5 – very unconfident)*	*e.g. Mean score*	*e.g. Mean score*

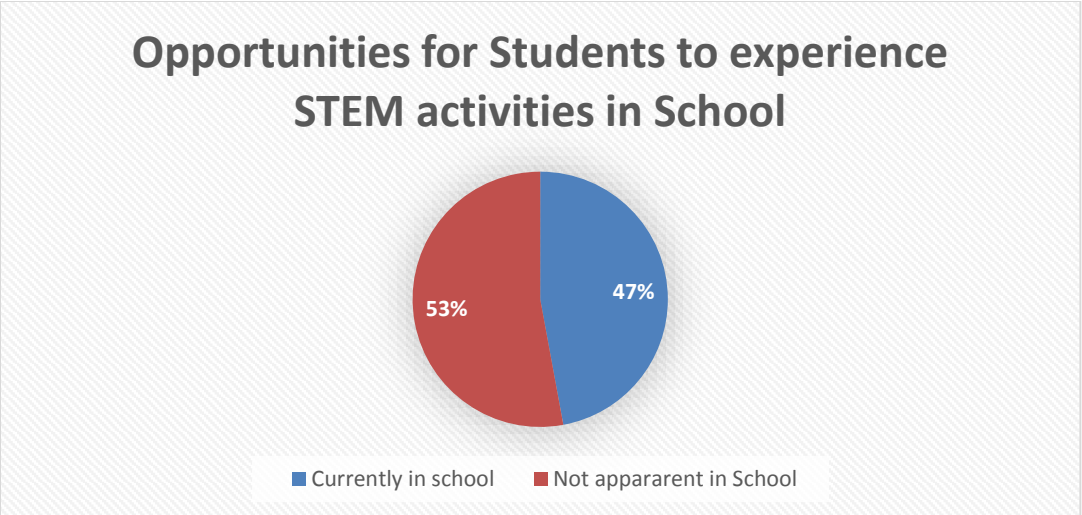
8.1.1 Please provide information (for both the intervention group and comparison group where you have one) on:

The evaluation sample for the teacher survey showed that the pre intervention survey was taken by 94% of the cohort which is an excellent sample and can be seen to be a good representation of the teachers involved in the programme. The post intervention survey for teachers dropped to 62% of teacher responding and this is still a reasonable sample and could be deemed was sufficient and was representative of the cohort. However it is important to understand there is a difference and this

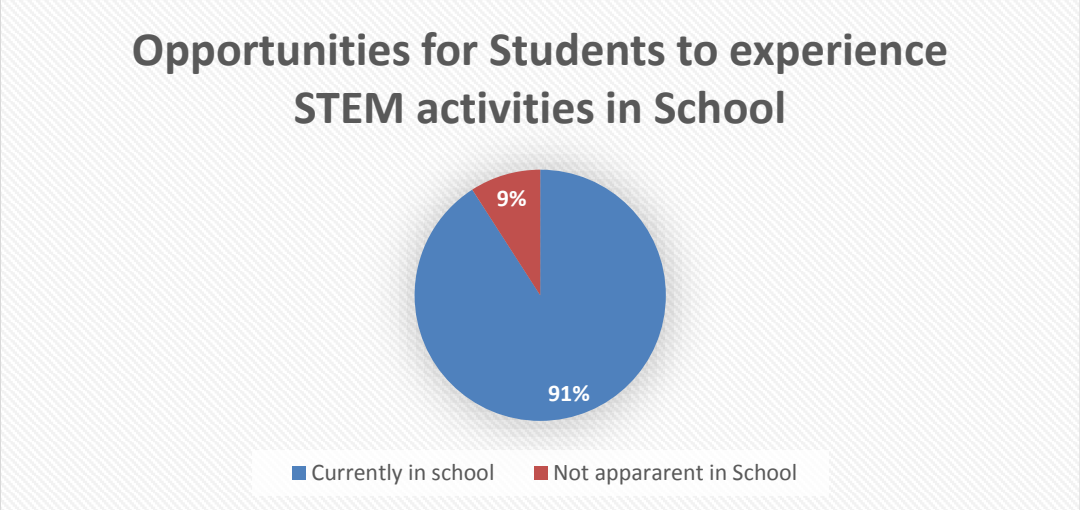
does impact the results that were analysed. The teacher interviews that were carried out a sample of 75% cohort was taken again a good representation of the cohort.
These two evaluation tools proved to be the most effective in gathering data. However, one of the questions on the Pre programme survey and Post programme survey showed little or no retort. This was an evaluation tool that asked teacher to draw a diagram to describe their thoughts about STEM. Even though it was deemed a simple task to draw and upload the diagram pre intervention and post intervention – engagement from teachers to do so was extremely low - with only 2.9% of the cohort answering this question in the pre intervention survey and 0% answering it in the post intervention survey. In addition to this during the interviews it could quite clearly determined that teachers didn't fully understand what that question was trying to achieve therefore were reluctant to answer or commit their own work.

It can be seen from the online surveys and interview data the perceptions of teachers about STEM and robotics learning changed with the programme even though both these tools also showed that a reasonable amount of the schools already had some STEM activities going on and some of the participants were confident in their teaching of robotics and computer programming. The diagram below demonstrate the changes and attributed figures.

The pie chart below shows the number of teacher that felt their schools provided STEM opportunities for students to be involved in pre intervention - Jan 15



The pie chart below shows the number of teacher that felt their schools provided STEM opportunities for students to be involved in pre intervention - July 15



In addition to the results above the qualitative data showed positive comments:

"The project has helped us to provide great kit that has enthused the students and many more now want to get involved!" *(Teacher, School 16)*
"If it wasn't for this kit – our D and T /STEM club can sometimes just become catch up for coursework – this project has helped us to refocus the club!"

(Teacher, School 11)

The greatest impact however was on the teachers who had little knowledge of the programme and robotics teaching as well. The 75% that were interviewed 60 % claimed to have really taken to the programme and were complimentary of the process training and support. Below are some of the statements made:

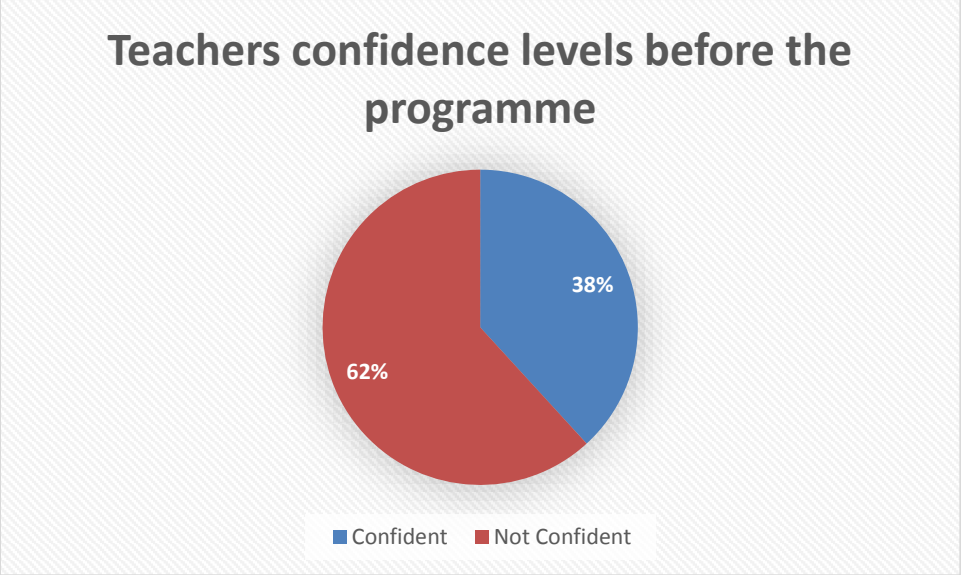
"I hadn't ever considered doing any Robotics because I just didn't know where to start so when this programme came about it gave me a point to begin at ….it was the best day – me making the robot, being hands on made me feel I know enough to go back and recruit a team and teach them about it!
(Teacher, School 06)

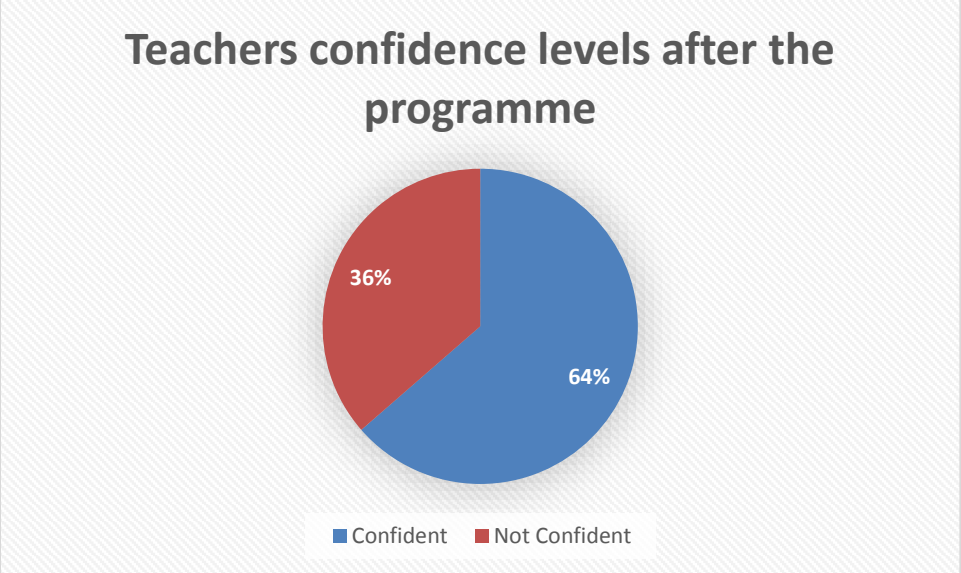
"I hadn't considered STEM teaching really but I loved the idea of it – I like to get involved but I wasn't at all confident with the programming elements to be honest they scared me a little being a bit of a technophobe ….but the training has really helped me and the training day building the robots and chatting to other teachers was absolutely fabulous…."

(Teacher, School 14)

It can be seen from table 9 the interviews also helped to determine whether the teachers were happier with the resources and whether they felt more confident. The charts below demonstrate the changes for the cohort.

The pie chart below shows the Teacher confidence levels for teaching a STEM based activity pre intervention - Jan 15





The pie chart below shows the Teacher confidence levels for teaching a STEM based activity pre intervention - July 15

It can be seen that 64% of teachers were confident in teaching a STEM activity based around robotics and computing post intervention, which is a rise of 26%. Also Design and Technology teaching and ICT teachers started to share resources and teach cross curricular projects whether however this was largely extracurricular projects. 7.4% of teachers had commented on sharing resources across subjects' pre intervention and 66.7% of the teachers were sharing resources across subjects post intervention. A huge rise of 59.3%. Even though the observation data has not been available which would have helped to triangulate evidence, the results above from the interviews and survey themselves are positive and reflect how well received the intervention has been and the immediate impact has had positive results.

8.2 Pupil Outcomes

Date pupil intervention started:

Table 11 – Pupil Outcomes for pupils benefitting from the project

The 1st Return will either be your baseline data collected before the start of your project, or may be historical trend data for the intervention group. Please specify what the data relates to.

Target Outcome	Research method/ data collection	Sample characteristics	Metric used	1st Return and date of collection	2nd Return and date of collection
More students interested in programming	*Online Surveys*	*The Sample consisted of 100% of the initial online survey being completed by 130 students* *And 42% completed the final online survey*	*Percentage difference in aspirations, interest in Robotics and programming*	*59.4% of 130 were interested in programming Jan 15* 61.3% of 130 had an interest in robotics Jan15 20% of the 130 students intended to go into a profession related to engineering and manufacturing Jan15	*61.9% of 42 students were interested in programming July 15* *90.5% of 42 had interest in robotics July15* 26% of the 42 students intended to go into a profession related to engineering and manufacturing July 15

Table 12 - Pupil Outcomes for pupil comparison groups *[if available]*

Target Outcome	Research method/ data collection	Sample characteristics	*Metric used*	1st Return and date of collection	2nd Return and date of collection
e.g. Increased educational attainment and progress in Writing	*e.g. Pupil assessment data*	*e.g. Characteristics and assessment data collected for 97 of 100. The profile of respondents matches that initially targeted in the Theory of Change.* *Please find detailed analysis of the profile of respondents in Section 7.2*	*e.g. mean score or percentage at diff National Curriculum Levels or GCSE grades*	*e.g. Mean score- 3.7, collected September 2015*	*e.g. Mean score- 4.5, collected June 2015*

8.2.1 Please provide information (for both the intervention group and comparison group where you have one) on:

The students surveys were taken once the programme had started therefore the results might have been affected by this however it was explained to the students that the Pre intervention survey was about their thought before being involved in the programme which the cohort seemed to understand well. 100% of the cohort filled in the online survey whereas the post intervention survey only 42/130 which is 32.3% filled in the post intervention survey. Now it is evident that this is a limitation as the sample is not a very good representation of the cohort. However the results still were positive and even though there is a large number of students that did not complete the post intervention survey those that did were very positive about the impact of the intervention.

60% of 130 students had not taken part in any STEM activity in their school prior to this programme, and 100% of the 130 took part in the Vex Competitions so straight away even without the survey we can see the programme has enabled 60% of the 130 students to be involved in a STEM based activity.

The survey looked at what students though about the STEM and all the students that were involved in the programme did seem to have an interest the subject areas and wanted to be involved – now this could be because of the nature of the activity. As it was an extracurricular activity which required the students to give up their own time so evidently it would suggest the students were switched onto STEM and had an interest in the activity. It is interesting that the opinions of the students were still affected 82.9% of the students reported that their opinion of STEM had changed 73.8% thought it involved more problem solving and 90.5% believed that robotics, programming and design was a vital elements of STEM.
Another element of the survey was to look at whether the career aspirations of the students has changed. 20% of the 130 students intended to go into a profession related to engineering and manufacturing and 26% of the 42 students reported to be wanting to pursue a career in engineering and manufacturing post intervention. Even though the cohort sample cannot be used to represent the whole cohort it can quite clearly be seen as an increase in the students' aspirations. Overall the understanding of the students and the perceptions of the students were affected by the programme in a positive way. In the future entries to the competitions can be analysed to see in this interest was sustained and also monitoring the students involved for further impact would be useful.

The sample collated for the programme shows 130 students directly engaged with the competition element of the project. Direct teacher impact was also tallied 40 for teachers who actively supported the competition element of the project. Through discussion with teachers, the scale and impact of the project can be quantified to be a much larger number of both pupils and teachers. The very nature of the programme, providing resources to run STEM based clubs, has meant that larger numbers of students have been able to make use of both the resources and the enhanced teaching of their teachers. Equipment at specific case study schools has quadrupled in amount thanks to schools committing their own funding to purchasing more kits, growing the programme numbers engaged with STEM based robotics considerably. At the host school, Highgate school, all 180 year 7 students engaged with the teaching materials and competition element of the project. Numbers have been estimated to measure at 550 students, and 100 teachers in total to have actively engaged in the project, which includes those who have been recorded in the data collection for the competition element. In two further case studies, schools had successfully crowd funded further equipment and therefore grown their programme offer into year 2, which has led to the development of the future phase of the project to move to a crowd funding London Stem Funding programme. Whilst the competition contributors data represents a sample of data relating to the project impact, it would not be beyond the future project plan to conceive measuring this wider impact and ongoing impact through the continuation of the clubs with new year groups, new students, and different age ranges. .

8.3 Wider System Outcomes

Table 13 – Wider System Outcomes

Target Outcome	Research method/ data collection	Sample characteristics	*Metric*	1st Return and date of collection	2nd Return and date of collection
Schools save money to invest elsewhere	*interviews*	*75% of the cohort was also interviewed either face to face or over the telephone.* *Good representation of the cohort*	*Percentage compariso n*		*25% of the teachers interviewed stated that schools had invested money to further the STEM clubs looking at their success* *75% of the teachers didn't not know where the schools would have invested the money July 15*
Schools to talk more to one another	*Observation / interviews*	*Observations were not returned by any of the participants* *75% of the cohort was also interviewed either face to face or over the telephone.* *Good representation of the cohort*	*No Data Available* *Comparis on of the qualitativ e data from interview s*	*No Data Available*	*No Data Available* *100% of the teachers interviewed had exchanged emails and used the designated webpage to exchange thoughts.*
Primary and secondary schools share skill sets	*No Evaluation tool in place for long term outcomes as yet*	*No Data Available*	*No Data Available*	*No Data Available*	*No Data Available*
Better lessons in schools	*observation s*	*Observations were not*	*No Data Available*	*No Data Available*	*No Data Available*

		returned by any of the participants			
Increased mobile robotics competition entries	*Entry data*	Whole cohort analysed	Comparison of schools entering as part of programme and post intervention	*90% of school participated in the Competition days July 15*	*Entries are currently open for registration with already 18 teams registered Sep15*

8.3.1

The results in the table above show that some of the wider outcomes have been achieved. As all the schools saved money whilst taking part in the programme as the equipment was free but 75% teachers involved in the interviews didn't really have the knowledge of where the saving would have been spent, or whether they could have afforded the kits initially.

All the teachers interviewed reported that they had exchanged emails and also used the designated website to assist or ask for help with the project. All of the teachers found this extremely helpful as arena to air their thoughts helped many overcome their fears of robotics as can be seen below from the comments made:

"….communicating with the teachers we met on the training helped because many of us where in the same boat – but some of the teachers were experienced that helped even more….."

(Teacher School 12)

"It was great to meet people who were trying to do the same as you – it makes you feel less isolated and helps to be more competitive also…"

(Teacher, School 32)

Unfortunately the observation data forms were not returned the by any of the cohort – there could be a number of reasons for this as explained in the limitations section 4, however this leaves a gap in the information and there is no real evidence to base a judgement about the sustainability of the project and its impact upon the types of lessons or the quality of the lessons being taught in the schools. The interesting findings from the data of entries for the competition is that originally 90% of the 40 schools entered into the competitive state and currently 18 teams have already registered to go on to this year competition, which demonstrates confidence and that the programme has been carried on by the schools and some of the schools have entered more than one team which would mean that they have purchased further kits and have more students being involved in robotics and STEM based activities.

8.4 Impact Timelines

Please provide information on impact timelines:

- It was intended that the training would have an immediate impact on the teachers as they programme required them to deliver and train the students. From the results 90% of the schools entered the competition which shows that this had to have taken place for the students to be prepared to compete in the competitions in addition to the this 6 schools have already registered for next years competitions
- The students were to be have been influenced during the year through the running of the programme but the impact should be sustainable and long term which can be seem somewhat from the change in aspirations and thoughts monitored in the surveys, but this could have be monitored more effectively over a longer period of time.
- The wider school outcomes that were directly related to the programme were meant to become apparent over the year but it is important to realise this maybe have been somewhat optimistic as the impact and impact assessment needs to be over longer period of time for this element as it can be more clearly demonstrated through the continued use of the equipment, participation of the students in competitions and the assessment of teachers lessons. Even though all of these can be effected by other elements it would still require assessment
- As mentioned above the full impact of the programme needs to be assessed over a two year period to make sure the impact has been sustainable to assess whether the students have been involved and impacted for more than the competition period and whether the perceptions and positive changes in teachers were in fact due to the programme and no other influential factors.

9. Reflection on overall project impact

- Overall the project was a success and achieved its intended outcomes, students were taking part in STEM activity and engaging in Robotics and felt happy doing so. The data obtained may or may not be able to attribute that change solely to the intervention programme but the STEM enrichment activities in many cases would not have taken place unless the kit was gifted to the schools and CPD was provided. Teachers engaged in the programme and perceptions of STEM and confidence levels of teachers were reformed. The schools provided STEM opportunities and became more proficient in their delivery of STEM and robotics.
- The theory of change was accurate however the timescale of evaluation of the many wider school outcomes was somewhat optimistic. As mentioned earlier it is important to understand that some of these wider school outcomes probably need to monitor over a longer period of time and using other data collection tools to ensure rigour and effectiveness.
- The overall aims of LSEF where met as:
- I. Teachers led the training in the programme and attention was refocused on the knowledge led teaching and curriculum development this could be seen from the interviews and the observations on the competition days
- II. The programme helped to develop self-sustaining school-to-school and peer-led activity, plus the creation of new resources through VEX Robotics and Teach Design and support for teachers through a central hub Highgate School as well as ongoing support through the webpage, to raise achievement in secondary schools.
- III. The programme helped to support the development of the activity which had already been tested however further support is required to evaluate the long term impact and to scale the programme further than the 40 schools involved.
- IV. The programme also helped to show that London Schools can be used as a centre of teaching excellence and the surrounding schools can benefit from this.
- The findings of the report support the hypothesis that investing in teaching, subject knowledge and subject specific teaching methods and pedagogy does lead to improved outcomes in terms participation and raising aspirations

10. *Value for Money*

10.1 Apportionment of the costs across the activity

Estimates of cost, activity and time allocation.

Broad type of activity	Estimated % project activity	£ Estimated cost, including in kind
Producing/Disseminating Materials/Resources	5% 100 hours of work	0% at £0
Teacher CPD (face to face/online etc)	35% (including some 1 to 1 support) 700 hours of work	8.5% at £10,000
Events/Networks for Teachers and evaluation	20% 400 hours of work	8.5% at £10,000
Teacher 1:1 support	As above	n/a
Events/Networks for Pupils	0	n/a
Marketing & sharing	20% 400 hours of work	25% at £31,000
Gifting Equipment	0% (purchase and gift)	32% at £37,000
Staffing and administration	20% 400 hours of work	26% at £30,000
TOTAL	100% 2000 hours of work	£ 118,000

The project assigned the largest majority of expenditure on the gifted equipment to the schools, as these material and resources would facilitate the project and was what Teach Design identified as key to success, the ability to receive free high quality equipment. Marketing, sharing and showcasing the programme, including leaflets, magazine articles, and online blog articles and social media sharing was also a key activity, though the majority of cost was associated with the production of the national magazine which si free to every school in the country and at no cost to schools. Staffing and administration of all operation s for Teach Design, and the collation of data and its interpretation was then key to the overall management and organisation of the project, including the coordination of events for CPD, launch, secondary launch, and the subsequent final meeting of the project. Despite the small cost to the CPD, this was the highest demand on the project and was administered with funding, equipment and good will of the trainers with Teach Design. Production and dissemination of resources, including certification, curriculum materials, and the further development of project materials was conducted on the large outside of the project fund, but made up a recognisable contribution to the project's success. On the whole the project challenged the typical approach to this form of curriculum development and change, as the largest amounts of funding went to the schools and the support of these schools. On reflection due to the nature of measuring impact, the project could have relocated funds to the data collection and potentially further CPD events into year 2 and beyond. If repeated, this project would focus on further training of staff with ongoing CPD once schools had the equipment to partake, and use less funds on marketing and sharing through costed magazines, choosing rather to fund successful web and social media campaigns instead. Some of the administration budget in this case has been used to create and fund websites to not only sustain but also grow the projects' web presence, but in future these pots of funding would be increased to support more effective targeted marketing if it were financially viable to do so.

10.2 Commentary of value for money

Upon reflection of the application of the fund to deliver the project, Teach Design were proud to be one of the few projects where the lion share of the pot was directly passed onto schools involved. It meant that those selected or offering to contribute were directly benefiting not only from training and expertise, but also on a more obvious capital gain level which would be recognised within school

equipment registers. In future, this approach would be considered successful as a model for Teach Design to affect change. Teach Design are also currently working with an LSEF funded website to offer the opportunity to crowd fund equipment, providing CPD on demand or over the internet, and working with local and national suppliers of equipment to deliver this.

Based on the numbers of schools and pupils engaging with the project this year at a competition level, and those that will year on year benefit from the sustained delivery of the clubs, the fund has been in Teach Designs' opinion been effectively managed. The project has delivered a sustainable model, with national companies stepping in to keep the network and hub working and able to meet and compete, without our trainer support, but continuing to benefit from the equipment, and working with ongoing numbers of students annually. The wider impact of the project with students beyond the competition, including those benefiting from the enhanced teaching of the staff, and the application of equipment and STEM materials into the curriculum also raises not only the profile of STEM within the school, but also gives viability to the division of the fund to the project.

The good will nature of the trainers work to deliver the project, would in future, need to be better reflected in the budget, and larger sums would be located to the trainers to support their work and acknowledge the efforts they make to ensure day to day activity is accounted for financially. Teach Design would direct more to the trainer payments and away from the marketing budget to help encourage not only the appropriate thanks to the trainers, but also ensure no one is working for good will above and beyond that which they have been employed to provide.

The spend assigned to CPD was appropriate compared to alternatives to remotely deliver training, and more fund would be better applied in future to this element of a curriculum project of this nature as it is the most effective method of supporting those to change and enhance their STEM offer. The chance to work and visit each school could have also been costed, as often many of the visits made by trainers and staff occurred as part of the day to day running of the project but not funded or reconciled from the fund. The resource development, and materials that were developed and shared during the project were done with the support and funding from national companies, and as part of the teacher engagement, and this could have been again reconciled to show thanks to those who did make effort to create sharable materials for others to use.

10.3 Value for money calculations

Not applicable

11. Reflection on project delivery

11.1 Key Enablers and Barriers to Achievement

- *The partners of the programme Vex Robotics and Highgate school enabled the programme to run seamlessly. All feedback received was extremely positive and complimentary of running of the programme. If anything it was a point that many of the staff in the evaluation process at how helpful Jon Taylor from Highgate and Paul Mcknight had been in training the staff and providing ongoing support. The levels of engagement were affected by the strong support and training and the composition of the activity also.*

- *To continue to improve subject knowledge the programme needs to be sustained and the networks created need to be nurtured by delivering further cpd and resources. The teachers that have been a part of the original training need to be identified as STEM leaders in this particular field and methods of further dissemination explored.*

- *The management and delivery of the process again was extremely effective, the training days ran as scheduled and ongoing support was provided.*

- *The website and blogging facility enabled teachers to become more autonomous in their learning and helped them to learn from their peers. The continued monitoring and progression of this resource is required to enable it to reach its maximum potential.*

- *The LSEF project has highlighted the need for greater STEM gifting and funding of equipment to London schools, training for teachers, ongoing support roughly early adoption, and am international competition to motivate students and teachers alike to succeed. With this in mind the programme has managed to set up the website www.londonstemfunding.co.uk, which it will be promoting with 8 of the 40 LSEF schools currently on the website looking to further fund STEM equipment for their school. The website will be a central hub for London companies, parents and students to fund raise for equipment they need to grow their offer, in light of the success of the gifted robotics equipment they have already in place. The project will work along the National 3D Printing Campaign, where expert teachers, loaned 3D printers by Teach Design with funding from the project, will explore and develop the technology, showcasing it for schools along some national partner organisations who will support the marketing and showcasing of the project outcomes. Hand in hand both the crowd funding and the campaign will aim to keep the STEM focus on the agenda for London schools, and encourage hubs and groups to network and share through the leadership of the teachers involved and Teach Design.*

  Additionally, the national competition which was the vehicle for motivation for this project, will continue year on year, with Innovation First providing the additional competition event dates in London for the 40 schools involved. This means that year on year, schools will be able to continue to network and compete against one another as the game and their skill set evolves. With the acknowledgement that some staff have moved schools, we also anticipate that schools involved in this group will grow to bring in new teachers as well as track those moving to new schools.

  To sustain the programme, Teach Design have identified that funding for trainers and face to face paid CPD teacher trainers will be key to ongoing growth in the confidence and success of this network that has been established. The network is at a stage where it could evolve and

bring new staff in, as was predicted and anticipated in the proposal, and this would be facilitated best with a trainer delivering free CPD on the last game, software and project targets. The networking opportunities would also help facilitate the sharing of teaching materials, tools and techniques for the success delivery of the robotics curriculum into the national curriculum more.

Success and knowledge developed through the project have been converted in to teaching tools, resources and case studies which are available through Innovation First. The success of the programme has been a model for National Grid who have launched a similar GirlsintoSTEM programme to 40 schools nationally, which is in its early stages and growing with more schools actively looking to teach robotics as part of a STEM offer. The knowledge of successes and failures in the data collection have guided this project also to ensure all schools can contribute to helping measure the impact of the work being done, and make cases for future programmes that impact directly on the teaching of STEM to all students..

12. Final Report Conclusion

The evaluation suggests that the project was deemed a success. It can be seen from even the incomplete data how much impact the programme has had on the cohort of schools in the intervention programme. The teacher outcomes and pupil outcomes have been achieved – the teachers involved felt more confident in using robotics and computer programming in turn their confidence levels increased making them less afraid to engage in the STEM activities. Without the intervention that opportunity may not have been exploited to begin with and the without the training and support that was provided some of the teachers involved would not have been able to deliver the extra-curricular activity. The empowerment of teachers in this invention had been key and the competition days as well as the data collected does show this. The intervention created opportunities for teachers to share best practice by use of the London schools project website and blogging space, the training days twilight sessions, and competition days all helped to create opportunities for teacher to share practice. Subsequent focus for the project at the end of the year has led to a crowd funding platform, with schools involved in funding growth to their offer into the 2nd year and beyond the support of the project, resource development and sharing well beyond the project focus and age groups, with resources developed for KS4 and 5, KS2 and Btec level qualifications. The continuation of the project network into the realm of 3D printing and sharing best practice within the hud and beyond to the wider London network is a spin off that was not realised at the start of the project nor anticipated by Teach Design. Thanks to the ongoing support of partner organisation, there is now opportunity to grow the project and evolve its contribution to the improved curriculum across London schools.

However, it is important to realise that some of the outcomes were difficult to monitor as due to the nature of the evaluation and original ask of the teachers and schools.

- More programming being taught – there is little or no data to support this and it could be monitored in future by assessing what SoW or extracurricular activities are taking place within each given school and how this had been impacted in the medium and long term. Intentions were to request development plans for each department, but these have not been shared upon request.
- Increased mobile robotics competition entries – even though 18 teams have registered to date from 6 of the schools in the programme this outcome is difficult to measure until the completion season is over later next year. Ongoing communication with the schools is showing that schools intend to keep working with the competition, and entry confirmation by February 2016 will confirm this.
- Primary and secondary schools share skill sets – in realistic terms again it would be difficult to attribute change to this outcome as sufficient data has not been gathered to demonstrate this. Also the sharing of skills with primary and feeder schools would normally happen in the later part of the term when it was very difficult for data to be gathered. If teachers and schools knew that this was an agreement and understood exactly what data and feedback would be required – it is felt that engagement to the evaluation process would most definitely be higher. At the current stage schools have been proactive in engaging with the project to help it succeed , but have struggled to deliver the data element that makes the process more measurable.
- Schools save money to invest elsewhere – this outcome again was not assessed rigorously enough at this stage. It could be demonstrated by exploration of the further extracurricular activities but it is felt that schools would need to agree to this before receiving kits and this could be used as a driver for further engagement. 8 of the schools have however requested to crowd fund further equipment rather than invest school budget to grow their project, and

2 schools have spent additional grant funds beyond their budget on further equipment to grow their offers.

The early stage CPD events were an outstanding catalyst for raising teacher confidence, preparing schools for change, and empowering teachers to delivery new content to their students. These events, though only Twilight, were hugely effective. The opportunity to run more of these in the future would ideally be the focus on any sustained element to the project. There was also clear argument for competition as a form of focus and driver for motivation. Schools keen to compete, raise their profile and gain recognition for their efforts were keen to do so on a competition front. This appeared to give greater emphasis on not only delivering new curriculum teaching, but also do so in a manner that was aimed at being better than the school next door. This was very powerful when it came to networking and sharing experiences, with each having tried and learnt from attempts which were assumed to lead to success.
Difficulties in collating data from large cohorts, including the measurement of impact beyond those attending the club, was seen as a very difficult process. Certainly there has been sufficient evidence and acknowledgement through case studies that the project has made huge impact beyond those in attendance, but measuring this data has been nearly impossible. With this in mind, future encounters with staff and students during a similar project would look at gaining direct and "live" feedback through questionnaires and evaluation forms in exchange for the release of equipment and resources. An agreement would need to proposed for the schools to take part that explicitly informed schools of the nature of data collection and the evaluation personnel would need to be given sufficient time and budget to carry out the evaluations. This would be a future proposal should the project be reborn next year or beyond.

Some of the key findings from staff interviews highlight that students attended clubs, made contributions to team based STEM learning, and curriculum delivery was being changed thanks to the project and its focus. There was not one single teacher who felt the new robotics club was not providing beyond their previous offer, and in all cases, clubs were run with enthusiasm and success and seen through the fantastic contributions to making the competition days a hive of activity and excitement. Those schools who chose and continue to choose to grow and fund their own offers have taken the next step in having ownership of the club and its running including those that wish to crowd fund more kit, and also with the support of our trainers and Innovation First to keep the hub and network going. Future collation of data would be useful to identify if students were not yet attending a club and had subsequently decided to do so in this case, or if their attendance on days when the club ran were better. In most cases the students were selected by the teacher, and attendance facilitated by the fact that the club ran during the school working day.

As with any intervention there are lessons to be learnt – ensuring the programme can fully justify the impact and change it has affected, and assuring the distribution of resources is effective to the nature of the aims would need to be a key focus if the programme was to continue.

Appendix 1

	Outcomes	Indicators	Baseline data collection[i]	Impact data collection[ii]
1	☐ Increased teacher confidence	☐ Increased teacher scores in confidence surveys ☐ Survey to be completed by all teachers involved in the intervention ☐ Teacher confidence surveys should be agreed with the GLA.	☐ **Scores collected for individual teachers from pre intervention confidence surveys (Teach Design bespoke tool)** *Date of collection June 23rd 2014* *Sample size = 100% = entire cohort to teachers (22)* *Administered by Teach Design Ltd.*	☐ **Scores collected for individual teachers from post intervention confidence surveys after Yr1 and Yr2 of intervention** *1st year June 23rd 2014* *2nd year June 22nd 2014* *Developed & Administered by Teach Design Ltd.* ☐ **Interviews/ focus group of sample of survey respondents to moderate survey findings. Sample size whole cohort.** *November 5th 2014* *Developed & Administered by Teach Design Ltd.*
2	☐ Heightened long term ambition	☐ Increased numbers of pupils report/ demonstrate higher levels of aspiration	☐ **Comparison group: Pre-intervention survey of aspirations and plans regarding H/FE and subject choices (Teach Design bespoke tool)** *Date of collection September 22nd 2014.* *Sample Size = 100% = entire cohort of students (300+)* *Administered by Teach Design Ltd*	☐ **Comparison group: Survey of aspirations and plans regarding H/FE and subject choices after Y1 and Y2 of intervention** *Year 1 = September 22nd 2014* *Year 2 = June 22nd 2014* *Developed & Administered by Teach Design Ltd.*
3	☐ Use of better subject-specific resources	☐ Development of better subject specific resources ☐ Uptake of new resources	☐ **Audit/sample scrutiny of existing subject specific resources being used** (Staff develop a diagram of what STEM is before, and then a diagram of what STEM is after the completion of the intervention. Focus on perceptions of STEM and pedagogy in schools before and after. This focuses on the approach to developing good resources rather than what it will look like) **Bespoke tool to Teach Design** Date of collection January 26th 2014 Sample size = 100% = entire cohort of teachers (22) *Administered by Teach Design Ltd.* ☐ **Launch date of new resources** Ongoing development and launch of resources Sample size = 100% = entire cohort of teachers (22) *Administered by Teach Design Ltd.*	☐ **Independent review of new subject specific resources and old audited resources** *Showcased in Teach Design Ltd magazine as article of STEM development* *Developed & Administered by Teach Design Ltd.* ☐ **Use of new subject specific resources in lessons (through lesson observations or work scrutiny). Usage analysed against performance in observed lessons. (Teachers will be questioned post lesson, about how they perceive the resources made on STEM teaching in the lesson. Not focused on Ofsted criteria, as this does not relate directly to STEM education. Due to observations being judgmental, direct teacher engagement is a more realiable and quantifiable data set. Triangulated by a self evaluation of the teacher in question) Delivered by Teach Design Staff. Whole cohort sample.** *Feedback from line managers of impact of teaching by London Stem Leaders* *Conducted ongoing basis* *Developed & Administered by Teach Design Ltd.*

4	☐ Teachers/ schools **involved in intervention** making greater use of networks, other schools and colleagues to improve subject knowledge and teaching practice	☐ Increased number of teachers who are trained to act as Lead partners	☐ **Number of trained Lead partners pre intervention** *Date of collection June 22nd 2014* *Sample size = 100% = entire cohort to trained teachers (40)* *Administered by Teach Design Ltd.*	☐ **Number of trained Lead partners after Y1 and Y2 of intervention** *June 22nd 2014* *Number of teachers trained and accredited as London Stem Leaders. Taken after training of new cohort by current cohort. Predicted to be 1 new teacher per 1 trained teacher (total = 40)* *Developed & Administered by Teach Design Ltd.*
5	☐ Programme activities/ model is embedded in department/ schools/ council planning **beyond the intervention group**	☐ Inclusion of programme activities/ model in development plans	☐ **Commitment/ sign up by school to specific criteria pre intervention** Schools signup to attend Regional robotics competitions. Inclusion of commitment to annual event in 2014/15 development plan or 2015/2016 dependent on school position. Recorded as review of development plans. June 22nd 2014 Sample size = 100% = entire cohort of teachers (22) *Administered by Teach Design Ltd.*	☐ **Part of department/ school/ council development plan** ☐ **Number of teachers following development plan/ due to roll out changes** *Taken as calculation of teachers in departments' vs number of development plans being acknowledged as part of future programme outcomes.* ☐ **Commitment/sign up by school to specific criteria as part of project** *Re-application for regional competition events post LSEF programme* *September 20th 2015* *Developed & Administered by Teach Design Ltd.*
6	☐ Use of new resources by teachers/ schools **outside the intervention group**	☐ Uptake of new resources developed by LSEF programmes by non LSEF teachers/ schools	☐ **Planned new resources to be developed by LSEF programmes** *June 22nd 2014* *Record number of resources developed and shared via London Stem Leaders website.* *Administered by Teach Design Ltd.* ☐ **Avenues of dissemination/ promotion** *June 22nd 2014* *Record of number of downloads across UK.* *Administered by Teach Design Ltd.* ☐ **Dissemination dates** *In line with TD magazine dates (tbc)* *Record download rate based on post magazine weeks.* *Administered by Teach Design Ltd.*	☐ **Number of resources downloaded from websites (by different schools)** June 22nd 2014 Digital recorded count of online downloads taken at last possible instance *Developed & Administered by Teach Design Ltd.* ☐ **Number of resources taken from training sessions/ conferences (by different schools)** June 22nd 2014 *Developed & Administered by Teach Design Ltd.* Count of resources taken after event = 100% count up ☐ **User feedback on quality of resources through online survey** June 22nd 2014 Online survey sent to download email addresses. Sample of entire response group (tbc) taken at 20% of total cohort. *Developed & Administered by Teach Design Ltd.*