# RCUK PUBLIC ENGAGEMENT WITH RESEARCH: SCHOOL-UNIVERSITY PARTNERSHIPS INITIATIVE (SUPI)

# FINAL REPORT - LANCASTER UNIVERSITY

**SUPI PROJECT NAME:** INSPIRING THE NEXT GENERATION
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| Glossary of terms: |  |
|---|---|
| BOX | refers to Research in a BOX which come in a variety of forms, e.g. PCR in a Box, Moot in a Box, Design in a Box, Diet in a Box. |
| EPO | Enabling, Process and Outcome indicators used as part of the evaluation framework to identify reasons for success and greater understanding of the challenges encountered, (EPO model developed by Helsby and Saunders 1993) |
| EPQ | Extended Project Qualification |
| ECR | Early Career Researchers who include PhD, Postdoc and Research Associates |
| LUSU | Lancaster University Students' Union |
| PIs | Principle Investigators |
| QES | Queen Elizabeth School, Teaching School Alliance including 10 schools who have engaged in activities during the lifetime of Lancaster's SUPI |
| RinB | refers to Research in a BOX which come in a variety of forms, e.g. PCR in a Box, Moot in a Box, Design in a Box, Diet in a Box. |
| SLF | South Lakes Federation of which QES is a member, an established strategic network |
| SUPI | School University Partnership Initiative funded by RCUK |
| SURE | School University Research Engagement the RCUK SUPI legacy project which will include EPQ, Research in a BOX, TURN, and the Brilliant Club, activities developed during the SUPI project |
| TURN | Teacher University Research Network that will be one of the SURE project activities |
| UKSRO: | Lancaster University's UK Student Recruitment and Outreach team who have responsibility for marketing, recruitment and widening access outreach. |
| WPCG: | Widening Participation Co-ordinating Group, chaired by Deputy Vice Chancellor with a membership of senior leaders including PVC for Education who chaired Lancaster's SUPI Steering Group and other members of the Steering Group notably LUSU Representative, Assistant Director of UKSRO, and SUPI evaluator. |

## List of Tables

a) Please provide a narrative summary that describes the journey your SUPI project has taken from beginning to end and covering all the key developments in between.

### STARTING POINT

At the start of our SUPI journey Public Engagement (PE) with research at Lancaster was primarily ad hoc and mainly delivered as 'one-off' interactions between academic staff and schools (quite often where their children were pupils). Both Lancaster's UKSRO (UK Student Recruitment and Outreach) and Lancaster University Students Union (LUSU) developed and delivered, often with departments, some very successful interactions with schools predominantly involving undergraduate (UG) students and for the purposes of recruitment and outreach to support our commitment to widening access. There was limited involvement of Postgraduate students or Early Career Researchers (ECRs), and whilst there was reference to research, this was not the primary focus.

Queen Elizabeth School (QES) an active member of the South Lakes Federation (SLF) had recently gained Teaching School status and was therefore committed to the 'Big 6 objectives' one of which was research and development, and another CPD. Although QES like other schools accessed outreach activities including campus visits, this was irregular and often a result of personal connections. It was from this starting position that Lancaster made its SUPI application.

There was a university commitment to PE with enthusiasts around the University; however, commitment was not directed towards schools, with conversations and senior commitment to bringing the work together in their infancy. The application for SUPI funding was the direct result of the recent establishment by the then PVC for Research, Professor Trevor McMillan, of a PE with Research Leadership Group, of which the SUPI programme lead, Dr Jane Taylor, was a member. The success of that application kick-started what is now a recognised activity that has been embedded in the culture of the University. The success of that journey would not have been possible without the enthusiasm and drive of the Head of School at QES, who was, and remains, committed to embedding a research culture within their Teaching School.

### A MAP FOR OUR JOURNEY

Lancaster's focus throughout was on 'inspiring the next generation of researchers'; to move towards our destination we recognised the importance of a multi-pronged approach and set objectives that targeted, engaged and involved our key stakeholder groups (young people, teachers, ECR) as well as strategic and operational mechanisms designed to bring about organisational change.

- Objective 1: Create a structured and strategic mechanism for engagement
- Objective 2: Provide dedicated training for early career researchers (ECR) to become effective and inspirational communicators of research
- Objective 3: Support direct and regular engagement with secondary level students, across the breadth of research undertaken at Lancaster, to enhance & enrich the school and PG curriculum
- Objective 4: Support teachers in their professional development and hence increase their confidence in using research findings to enhance their teaching
- Objective 5: Remove barriers within the university to effective & widespread communication of research activities

### KEY MILESTONES ALONG THE WAY

The successful outcomes achieved along the way and delivered by the end of the SUPI project are a result of our drive to achieve the learning objects as set out in the application. They include: learning about 'how' to undertake successful PE; understanding the constraints to engagement by both schools and the University; developing a shared

understanding of how the different types of institution work; establishing mutual respect and shared values for the professional activities of the two institutions, such that in times of intense change for both establishments, the intended outcomes continue to be delivered and grow in a mutually supportive environment.

Our approach and the principles we have adopted have been important, with the vast majority of our activity being new, research focused and mutually beneficial to school and university. The core activities have all resulted from collaboratively generating ideas and agreeing on a plan of action that has involved starting small, piloting the activity co-created by university and school staff, and adopting an embedded evaluation that was developmental. This development cycle is evident with our work on Extended Project Qualifications (EPQ), Research in a Box (RinB) which has provided a breakthrough for engaging researchers across all four faculties, and our STEM Inset which has grown and developed positive working relationships between university and school staff, but also strengthened schools' networking activities.

## A LIFELONG – PROJECT-WIDE LEARNING JOURNEY

Important learning outcomes have been gained by both the University and QES Teaching School and other schools with whom we have worked. The mechanism by which objective 1, involving the development of a structured and strategic mechanism for engagement and sustainability was achieved involved:

- The people leading this project: staff with sufficient seniority, whose opinion and actions are valued, to forge high level relationships within the institution;
- Key people in the school: a senior manager who is highly motivated to embed research into educational practice and promote the benefits to other school leaders;
- A project management group with links into strategic university groups (Lancaster University Public Engagement (LU PE) / Widening Participation Co-ordinating Group (WPCG)
- Delivery: engage enthusiasts and early adopters who can communicate effectively with both the school and university staff and who have first-hand experience of the research process;
- Experienced evaluator with an Educational Research background: to evaluate the project, and also strategically contribute to its forward development and long-term sustainability.

Key elements of the process that have contributed to the project's success include:

- Learning about the cultural differences between school/college and university environments, particularly time frames for planning and delivery of activities; learning about the barriers to staff engagement in both settings; developing confidence in, and respect for, such differences by all parties;
- Understanding that one of the most important people in the project is the co-ordinator that liaises between the different types of institution, and the continuity required of this position;
- Appreciating the constraints to delivery and how the focus of activities can be influenced by external influences e.g. demographic changes to university recruitment practices; "evolving priorities for individual schools, changes to curricula and funding arrangements" which in turn change the working relationship between individual schools.

## INSPIRING THE NEXT GENERATION

Our SUPI began with a large launch and concluded with a celebration of the journey at which senior university leaders gave their support and endorsed the project and confirmed commitment to the agenda. We also heard from university researchers who shared positive accounts of the personal and professional benefits of research based public engagement, and we learned how schools looked forward to learning more about research and how they had 'learned to live with doubt'. Perhaps most inspiring were young people themselves who disseminated their research undertaken as part of their EPQ, an encouragement to us at the start of our journey and a reminder of the importance of continuing to inspire the next generation of researchers.

## a) Please list the key findings from your SUPI project

Although inspiring the next generation of researchers involved activities for young people, teachers and ECR, it is those activities designed to enrich the curriculum through interaction with researchers and enhance teachers' engagement with and integration of research into their teaching and learning that we wish to highlight. The holistic collaborative approach used to develop and deliver activities means that others benefit as well as the primary beneficiary.  A full range of activities are listed in section 2c.

### EXTENDED PROJECT QUALIFICATIONS (EPQ)

EPQ was a core objective3 activity that directly involves students in undertaking an extended project that involves them in primary and secondary research on a topic of interest; SUPI provided opportunities for ECR to access training (objective 2) to support EPQ students.  We worked with 3 schools supporting a total of 248 pupils with their extended project qualification (EPQ) work. The model of interaction and support has evolved in response to observations by a school university working group who have reviewed developments on an annual basis. See table 1 for an overview of features for each year. Key developments included:

- A move from individual subject matched ECR and EPQ student to provide access for all students, and emphasize general research principles, the reasons for doing research alongside ECR specialisms;
- Inclusion of library ECR training to complement safeguarding training (objective 2);
- Support for school librarian to supplement referencing workshop;
- Developing the nature of Moodle support and range of resources provided;
- A decision to change from the open entry and introduce selection criteria to address drop out;
- Addressing factors of sustainability to expand the offer and provide flexible support for more EPQ students.

| Key feature of EPQ programme | 2013 | 2014 | 2015 | 2016 SUPI | 2016 SURE |
|---|---|---|---|---|---|
| ECR matched to EPQ students based on subject | ✓ | | | | |
| ECR matched to groups of students | | ✓ | ✓ | ✓ | ✓ |
| School Moodle: ECR answer own EPQ student questions | ✓ | | | | |
| School Moodle: ECR answering any questions | | ✓ | ✓ | | |
| LU Moodle: open to wider set of schools | | | | ✓ | ✓ |
| Face to Face visits at university | ✓ | ✓ | ✓ | | Option |
| Face to Face visits at school | ✓ | ✓ | ✓ | | Option |
| Library visit to support access to wider resources | ✓ | ✓ | ✓ | ✓ | Option |
| University support with referencing presentation | | | ✓ | | |
| Teacher – University – Library Consultation and Collaboration | ✓ | ✓ | ✓ | ✓ | |

**Table 1: Key features of the EPQ Programme**

During the SUPI lifetime we have piloted interviewing and training for ECR with processes now aligned to wider recruitment, induction, training and support arrangements, including practicalities associated with travel or payment, and timetabling.

**Student Achievement:** Since the start of the SUPI there has been an increase in the average percentage of marks gained by the QES EPQ assignments submitted as follows:

2013: 53%         2014: 62%         2015: 64%         2016: 68%         2017: 80%

Average % A*-B grades:

2012: 53%         2013: 48%         2014: 66%         2015: 40%         2016: 48%         2017: 73%

For the 2016 results, 40% of students achieved above their predicted grade for the EPQ (with a further 33% meeting their predicted grade), and the predicted figure for A*-B grades was 29%, but the actual figure was 48% - far higher than the prediction. The school were particularly pleased at the success of pupils who exceeded expectations, for instance one student who was predicted an E and gained an A and four students who were predicted C and were awarded A*.  These examples provide inspiration within school for future students. The 2017: results A*-B: 73% (61% of which girls, 39% of which boys) far exceeds the prediction overall for cohort which was 38% A*-B. Four girls and one boy predicted a C exceeded expectations and came out with an A*.

**Benefits for EPQ students target for objective 3, relate to:** increased awareness of the research process and experience to support future learning and career plans: for some students learning related to specific study skills, planning, organisation, referencing, and writing, for others it was more long term and research focused. Engagement in EPQ is both rewarding and challenging, and valued because of how it mirrors university research; in 2016, 84% of students agreed they felt more confident about research at the end of their project. They explained:

*"It's good to have the freedom to research something that really interests you - it makes it less hard work".*

*"I definitely understand how to manage my resources better as well; this will almost certainly help me when I come to do my dissertation when I hopefully go to University".*

*"EPQ has helped me gain useful information on developments in my future career"*

*"really useful in preparing me for further study, especially because my topic was directly linked with what I hope to study at university. The research meant I had something to talk about in my personal statement that I felt really confident about and could reference books and other research"*

EPQ students welcomed the opportunities gained from working with the ECR, 74% confirmed asking ECR questions about their own EPQ research projects, 68% gained ECRs assistance to understand the research process and 37% referred to increased resources following ECR recommendations. Enabling EPQ students to access and use credible resources was an obstacle discussed with teachers; it relates to journal access and to mitigate this challenge ECRs received additional library training including a focus on open source materials which has been welcomed by EPQ students, their teachers and the ECRs themselves.  Recent

results from Brilliant Club also show the benefits of close interaction between ECRs and students engaged in similar independent research activities. According to one of the ECR "*the experience with the brilliant club will be useful if I stay in academia since I now have experience designing and delivering tutorials at first year university level, as well as grading the subsequent coursework*" - this is something we will be evaluating further.

**Benefits to ECR** included continuing professional development (CPD – objective 2) for ECR such as the opportunity to develop their PE skills by sharing their own learning journeys to inspire and extend EPQ pupils' awareness of the diversity of research possibilities, access safeguarding and library training, and gain an insight into teaching. The incremental development process was also welcomed by several ECR who participated for a second time,

> *This year this was even better, as we were able to chat to more than one student at a time which meant we were more likely to help at least one student. Similarly, in that sense, the students had the opportunity to talk to more than one researcher! Attending the EPQ lessons at QES were also extremely useful, as this again widened the number of students we had chance to engage with. (ECR returning for 2nd year)*

> *My expectation is being able to provide a brief insight on researcher's reality, motivating them not directly to choose this path but being conscious of the advantages and rewards, but as well of the drawbacks and implications of this type of career. Summarising, provide information enough for them to understand and, if it is the case, to select this profession. In addition, the second objective is helping them in their project, not especially only to accomplish it successfully, but making them closer to research. (ECR)*

**Benefits for teachers and librarians (objective 4) relate to:** increased confidence, with staff reporting professional benefits and confidence gained from greater collaboration with other schools and the university;

Teachers reported that overall SUPI has helped to enhance their EPQ provision and give:

> *"that professional edge and made students more keenly aware that it's a qualification really valued by HEI's, that they're prepared to invest time and resources and people towards supporting it, I think they then begin to see that there's a direct correlation between what they're studying on the EPQ and how that impacts at university"*

**EPQ sustainability:** Evaluation of EPQ during the SUPI pilot, the delivery of EPQ and collaboration with other SUPI has facilitated resource exchange and allowed us to identify important process and enabling indicators these relate to: MOODLE development and protocol, ECR training needs and workshop development, guidance material for schools, ECR and EPQ students. EPQ as an activity will remain a core SURE project activity. The School University Research Engagement (SURE) project is Lancaster's SUPI successor project that provides sustainability for several SUPI activities (EPQ, RinB, Brilliant Club, TURN). Through the SURE project, EPQ will become embedded within the UKSRO marketing, recruitment and widening access menu of activities and include a menu of activities that were all piloted during the SUPI project.

## RESEARCH IN A BOX

At the time of writing 20 different boxes have been commissioned under the Research in a BOX activity including 6 developed exclusively with SUPI funding and 14 jointly funded by SUPI and widening access funding awarded by Lancaster's Widening Participation Co-ordinating Group (WPCG).

The BOXES were co-created by researchers from 15 departments and teachers from 40+ schools and represent a key activity contributing to objectives 1, 2, 4 and indirectly but effectively to objective 3. The engagement of academics and researchers in Arts and Humanities in developing and offering activities has grown over time, albeit at a slower pace than the more established STEM related activities. BOXES include topics which do not directly map onto school subjects but which have the potential to inspire and raise the profile of subjects that students might study at university, for example 'China in a Box' or 'Rethinking disadvantage in a Box'.

Each BOX contains guidance materials and resources required for teachers to deliver the activity in school; 4 BOXES contain videos with researchers talking about their research and online resources as a stimulus for the activity.  Online resources enable us to deliver BOXES to schools outside the region.

**Development process:** involved interaction between teachers and researchers who piloted activities, reviewed the guidance material to ensure it was accessible and age appropriate.  The process was heavily influenced by the principle of co-creation and the nature of established relationships with schools and teachers' issues which are discussed further in section 2b 'Working in partnership'.

**Administrative processes:** during the project it became apparent that more standardised systems for publicising, borrowing, returning, assessing risk, checking and replenishing boxes, insurance as well as evaluation are required. Developing robust systems takes time, the additional year provided an opportunity to move from the initial localized arrangements with the SUPI schools to develop a more systematic process which takes account of the diverse nature of BOXES with respect to size, weight, transportability, the extent to which contents need replacing or checking before and after use.  Administrative processes are still being refined in response to feedback.

**Common BOX features and modes of delivery:** although each BOX is unique, there are several common features that engage:

- **experienced and early career researchers** – for instance, impact of their research through public engagement, embedded opportunities for professional development evidence for ECR to enhance CV (objective 2), and research focused outreach to support recruitment and inspire next generation of researchers;
- **teachers and technicians** – curriculum enrichment, access to resources especially for STEM subjects to extend learning experiences and skill development, chance for pupils to learn more about research and university, professional opportunities for themselves to access research focused CPD.

There are now several modes of delivery which reflects the range of circumstances and contexts in which a BOX might be used:

- Face to face with ECR visiting school to support delivery or as part of a follow up activity;
- Face to face delivery by the teacher with ECR / researcher video input; #
- Face to face delivery on campus as part of a school visit or a summer school experience;

- Online resources used by the teacher with ECR / researcher video input; #
- Face to face CPD for teachers on the use of a BOX as part of INSET and future TURN meetings;
- Face to face delivery by ECR / researcher at other public engagement activities e.g. during Campus in the City (A shop rented in middle of Lancaster for a month used for PE with high profile in local media, see video).

# the option of virtual meetings to provide discussion is also being considered;

We also piloted use of video conference for PCR in a Box to demonstrate delivery to teachers and pupil in school, however due to the technological challenges this is not regarded as a wholly practical option.

Research in a Box is a flexible and successful activity; the involvement of researchers and focus on research is distinctive (objective 5):

described as *exciting and interesting because its contents are close to research-level physics, in an accessible format* Physics Photonic Research in a Box

enabling school *to use equipment we can't afford and don't have access to but mainly having people [researchers] who came along with it!* PCR in a Box

giving teachers *Confidence in knowing the nuts and bolts of PCR as a technique not just a theory.* PCR in a Box

*The students were able to significantly improve their scientific drawing skills using the lenses and insects. The range of insects available for them to draw enabled them to challenge themselves and gain experience in drawing a range of structures in detail.* Observation in a Box

### Research in a BOX sustainability (objective 1):

The Parasites in a Box has been used with our LU GHANA colleagues; one was given to Dr Kwakye Nuako a lecturer at Cape Coast University, used it with one local school group 30 children, a further 30 children also used it as part of the Ghana Global Health summer school (August 2016) as demonstration for Public Health students from Boston University and also shown to students at Noguchi Research Institute (University of Ghana) as a demonstration of how we can do public engagement with school children.

The activities are now integrated into the SURE project, which is based in UKSRO. Monitoring and evaluation of outcomes relating to usage, as well as identification of enabling, process indicators, will be reported to WPCG.

## CURRICULUM BASED CPD FOR TEACHERS

Activities for teachers were central, providing the basis of building teacher confidence to engage with research and the opportunity to engage with university researchers, which was pivotal for the co-creation that underpinned the development of activities for students. Overall 211 teachers from 10 schools participated in curriculum based research informed CPD - approximately 4 days * 6 hours of staff development, a further 140 attended curriculum based research conferences.

**Benefits of curriculum based Inset included:** introducing teachers to the campus and facilities, raising their awareness about university research, gave them and university staff the chance to discuss research and ways in which Early Career Researchers may be able to support them in teaching and learning in school. The days also served as an effective opportunity for informal peer professional development and networking opportunity. University staff learned more about the school curriculum, which their own 1st year undergraduate students have experienced, which may support university curriculum development to ease transition.

**Reasons for STEM Inset success included**: collaborative planning, that started small and expanded over time in response to feedback and benefitted from enthusiastic teachers 'passing on' the benefits to colleagues. Other enabling indicators such as building the event into the school calendar of multiple schools allowed teachers from different schools to network with each other as well as university researchers and was a time and cost-efficient use of university personnel. As one teacher noted: *'really useful to make links for the future and explore possibilities for mutual co-operation'.*

Pitching the activities at the right level and for application back in school was also crucial. STEM co-ordinators representing school (John Ince) and university (Alan Darragh) played a pivotal role in the iterative development of STEM Inset. Several teachers spoke about this when commenting on the session, one valued that university staff had *'not made assumptions about level of [our] knowledge'*, and another appreciated the *'good hands-on application that can be replicated in the classroom at all Key Stages'*

**Arts and Social Science Inset:** Despite the positive Inset in 2015, the STEM model has been difficult to replicate. Possible reasons for the challenges include: the absence of existing discipline subject networks within the Teaching Alliance and subject coordinators working in school who have the same degree of influence with colleagues in other schools. From the university perspective, the university Arts and Social Science coordinator is a more recent appointment and has responsibility for a larger number of departments, several of which don't map directly onto a school subject. Whereas the subject diversity engaged interest in Research in a Box and provided CPD that way, it has not been a sufficient draw for multiple schools to designate inset time.

**Sustainability of curriculum Inset**: STEM inset is now an established event in the school and university calendar and is expected to continue with funding from Faculty of Science and Technology, school and university coordinator's planning time, and schools' own funding for transport and allocation of Inset time. There is also commitment by SLF and the University to continue to explore ways of extending Arts and Social Science opportunities.

## RESEARCH BASED CPD FOR TEACHERS

CPD for teachers and engagement of teachers and senior leaders to undertake research themselves consisted of 2 teachers studying for a PhD and 8 undertaking small scale pedagogical action research projects (see section 4a 'Teacher Research Reports').

**PhD Programme:** initially four teachers enrolled, two dropped out for personal reasons and two continue providing feedback on the advantages of undertaking research as well as the challenges. Alison Wilkinson QES Headteacher explains:

*"As a school leader I am presiding over the constant balancing of competing tensions and priorities including: maintaining a sense of agency in the face of external drivers as well as finding time to engage in research relating to school practice and academic discipline research. One of the advantages is that the RCUK-SUPI has afforded opportunities to access and engage in both."*

**Small scale action research**: Building on support for students, we developed a successful bespoke programme of Inset for teachers to undertake their own research supported by the SUPI evaluator and ECRs who guided teachers through the research process. As one teacher explained:

*"It has been valuable and a genuine learning experience, often school-based INSET is about training to adhere to school policies and systems, rather than reflecting on how to be an a more effective practitioner".*

Although not part of the original SUPI plan, it appears this research focused new professional development route is attractive to teachers who may not wish to pursue a leadership and management role, and are unable to commit to larger scale study, but who are keen to engage in research informed practice.

**Sustainability of research based CPD for teachers:** SUPI has provided evidence of interest and commitment from schools, but funding heavily influences continuation. As part of its Access Agreement Lancaster is considering how it might widen the range of opportunities to support teachers CPD. QES as part of their Studio School (starting in September 2017) are discussing with Lancaster's Centre for Education Training And Development (CETAD) a modular programme of research focused CPD. Our Department of Educational Research is launching a new online MA later this year which is expected to appeal to teachers interested in educational research. REAP (Researching Equity, Access and Participation) are seeking future funding to continue and develop the model of small scale action research projects developed during SUPI with East Lancashire Inclusive Partnership.

**b) Please list the most important learning points from your SUPI project**

Lancaster's SUPI progress was based on an iterative process of piloting activities, gathering evaluative formative feedback to identify Enabling, Process and Outcome (EPO) indicators that informed future adaptation and delivery. The following indicators are cross cutting and influence the key learning activities listed in 2a and engagement activities listed in 2c.

## STEERING GROUP, STRATEGIC CONNECTIONS AND KEY INFLUENCERS

SUPI brought together partners committed to working and learning together. There were external drivers (RCUK-SUPI funding, Teaching Alliance research and development remit), internal strategic agenda (regional commitment, ECR development-objective 2, teacher CPD-objective 4) and a willingness by key individuals to seize the opportunity. Our experience suggests that only strong University-School partnerships will be sustained in the current rapidly changing and volatile operating environment.

**Involvement of senior leaders** within the university and QES Teaching Alliance have championed the project since the beginning and are influential in identifying and supporting proposals for sustainability of the project in the future. For example, PVC for Education Professor Sharon Huttly is PI, chair of Steering group, and member of other relevant committees with a remit for PE as well as outreach. Alison Wilkinson,

Head of QES, is championing research within her own school and more widely within the South Lakes Federation. Lancaster's SUPI Academic Lead Dr Jane Taylor provided continuity throughout the project, her experience and membership on faculty, public engagement and other university committees including Council has enabled her to manage the project and multiple stakeholders. She will chair the SUPI successor project, the School University Research and Engagement (SURE) project (objective 1).

The **regular steering group meetings** and broad membership comprising of senior leaders, researchers, outreach staff, students' union and school staff reviewed plans, considered emerging lessons and decided on priorities. They provided a diversity of perspectives that aided communication and understanding about the constraints to delivery and how the focus of activities can be influenced by outside forces e.g. demographic changes to university recruitment practices; "*evolving priorities for individual schools, changes to curricula and funding arrangements*" which in turn change the working relationship between individual schools. The longevity of SUPI has provided the time to generate interest and network across the university and to effectively communication to truly learn and understand each institution's culture (objective 5).

## OPERATIONAL CONSIDERATIONS

**SUPI Co-ordinator a key mechanism for communication (objectives 1 and 5):** Perhaps one of the most valuable lessons outlined in Case Study 2 (2016) was recognizing that one of the most important people in the SUPI project was the co-ordinator who needed to be able to liaise between the different types of institution (school and university), personnel (researchers, teachers, ECR and a plethora of university professional services and school alliance leads and administrators). The benefits of the SUPI co-ordinator having a research background to increase credibility, and an appreciation of, and ability to communicate the distinctive nature of research based outreach and PE, were identified as important for sustainability of SUPI activities within the new SURE project.

Other factors that supported objectives 1, 4 and 5 relate to successful development and delivery of activities include learning about the:

- cultural differences between school/college and university environments, particularly time frames for planning and delivery of activities – development of a shared calendar supported long term planning required by school;
- time needed to build working relationships between university and school staff and respective confidence about working in a different environment;
- importance of an absence of competing priorities; whilst teachers have expressed interest in using research, for some other demands on their time have impacted on the time required to enable them to integrate research findings and opportunities into their teaching;
- most effective communication channels including individuals who have access to, time and opportunity to publicise, champion and / or in some cases influence engagement was often key – for instance there was greater participation by QES throughout, which we attributed to Senior Leadership engagement, school readiness, greater opportunities to influence direction and build working relationships with university staff;
- barriers to staff engagement in both settings; developing confidence in, and respect for, such differences by all parties;
- best way for the university to respond to new requests without creating unrealistic expectations
- most effective way to promote the benefits to individual researchers and departments.

## WORKING IN PARTNERSHIP: A COLLABORATIVE CO-CREATIVE APPROACH

The co-creation and co-development of the activities, especially Research in a BOX, is crucial because it:

- increases the likelihood of activities that are fit for purpose,
- ensures ownership by schools and university staff including 'buy in' from University PIs and leader;
- helps to enable clear curriculum links and materials that are targeted and scaffolded according to the age of the pupils;
- inspires students about research and support their transition into university (objectives 1, 4 and 5).

Engaging teachers requires timely, tangible and relevant examples about how working with the university can provide access to resources, cutting edge research, networking opportunities with other schools and university researchers to enhance their teaching and the students' learning experience (objective 4).

Engaging academics is similarly supported by showcasing positive examples of PE, offering seed corn funding to involve ECR to support, and in some cases take a lead, to develop and devise the activities and emphasise the benefits gained from understanding more about the A-level curriculum and teaching and learning within school (objective 2).

Although we prioritized co-creation, it is important to recognize that this approach increases development time, which needs to be factored in because it has implications for funding and timescales.

Despite the benefits there are logistical challenges to overcome. Effective co-creation is not always straightforward, our experience highlights the importance of having existing relationships where school staff recognise the benefits and distinctive nature of research focused outreach, AND support for university staff to access the relevant teachers with whom they will work. Additional time needs to be allocated to building relationships and using teachers who have realized the benefits of working this way to publicise the opportunities with their peers.

### c) Please list all engagement activities that were developed and run during your SUPI project

The engagement activities are grouped under five headings that relate to a target group with whom we worked or were seeking to influence in order to inspire the next generation of researchers. For each target group, the diverse range of activities is summarized based on the evidence collected. *Italicised activities are planned to continue either as part of SURE or within faculty / departments;* other activities may continue subject to funding.

| Total Young People | Hours for Young People | Number of School staff |
|:---:|:---:|:---:|
| 1776 | 5,621 | 472 |

**Table 2: Overview of numbers of young people, hours and school staff**

## YOUNG PEOPLE: THE NEXT GENERATION OF RESEARCHERS

The activities for young people which are the focus of objective 3 of Lancaster's Inspiring the next generation of researchers, are listed in alphabetical order, for each engagement activity we provide a succinct description with details about delivery time, reach (numbers involved) and outcomes.

| Activity | Time | | | Reach | | |
|---|---|---|---|---|---|---|
| | **2014** | **2015** | **2016** | **KS3 &4** | **KS5** | **Schools** |
| *Extended Project Qualification: including 1:1 and small group mentoring face to face and online via Moodle, campus visit including library workshop and study time.* | ✓✓ | ✓ | ✓ | | *248* | *3* |
| *Brilliant Club: pilot in summer 2016 followed by LU commitment 2017* | | | ✓✓ | *122* | | *11* |
| *Brilliant Club: Mentoring* | | | ✓ | *24* | *16* | *4* |
| *Research in a Box School Delivery: various teacher led and research supported activities using classroom or online BOX materials.* | ✓ | ✓ | ✓ | | | |
| *Research in a Box Campus Delivery: Box activities used as part of subject based Summer Schools* | | ✓ | | | | |
| **Curriculum Enrichment Activities:** | | | | | | |
| Art and Science Masterclass: campus visit involving engagement with Art and Science researchers developing observational skills | | ✓ | ✓ | | 31 | 5 |
| Science Technology Taster Day | ✓ | | | 180 | | |
| Chemistry and FST Poster Competitions: | ✓ | ✓ | ✓ | 129 | | |
| Geography Food Security | | ✓ | ✓ | 280 | | 1 |
| Maths Master Class: involved creation of new resources for younger age group | | | ✓ | 120 | | 6 |

**Table 3: Breakdown of activities time and reach for young people**

## TEACHERS: KEY INFLUENCERS OF THE NEXT GENERATION OF RESEARCHERS

The activities for teachers,objective 4 of Lancaster's approach that recognizes the importance of teachers as key influencers, are listed in alphabetical order, for each engagement activity we provide a succinct description with details about delivery time, reach (numbers involved) and outcomes.

| Total Teachers | Hours for CPD *exclude PhD* | Other members of community |
|---|---|---|
| 472 | 3634 | 2784 hours |

**Table 4: Overview of numbers of teachers, hours and schools**

| Activity | Time | | | Reach | |
|---|---|---|---|---|---|
| | 2013-14 | 2015 | 2016 | Teachers | Schools |
| STEM Inset: Biological Sciences | ✓ | | | 15 | 3 |
| *STEM Inset: Biology, Chemistry and Physics* | ✓ | ✓ | ✓ | 152 | 10 |
| Arts and Humanities Inset: | | ✓ | | 4 | 1 |
| Teacher Conference - general | | | | 40 | 30 |
| Teacher Seminars – Religious Studies | | | | 150 | 60 |
| *PhD in Education:* | | | | 4 *(2)* | 1 |
| Teacher Research Projects: | | | | 8 | 5 |
| *Teacher University Research Network* | | | | *25* | 8 |

**Table 5: Breakdown of activities time and reach for teachers**

## ACADEMICS AND EARLY CAREER RESEARCHERS: THE CURRENT GENERATION AND FUTURE LEADERS OF RESEARCH

The types of activity for ECR activities (objective 2) are listed in chronological order under three main headings: 1) formal public engagement events and 2) bespoke activity related training and 3) Academics and Principle Investigators.

| | Total ECR | Hours | Total Staff contributions | Hours |
|---|---|---|---|---|
| Formal PE Training | 66 | 200 | | |
| Bespoke EPQ Training | 58 | 116 | | |
| Activities | 240# | 958 | 129# | 523 |

**Table 6: Overview of numbers of ECR and University staff, hours and schools**

# number of contributions, some ECR and staff contributed to more than one activity so will have been recorded more than once.

**1) Formal Public Engagement events**

- ***Research in an inclement climate (2013):*** How to thrive and survive as a researcher in the 21st Century: conference organized for ECR outlining training and support available, offering a programme of workshops looking at different aspects of public engagement.
  Outcomes: signal of institutional commitment with Deputy VC keynote, networking opportunities, promotion of SUPI and recruitment of ECR to SUPI activities.

- ***VITAE The Engaging Researcher*** (2014), a full days training on public engagement.
  Outcomes: recruitment of ECR for SUPI activities, raised awareness of core team on training activities

- ***NCCPE Public Engagement Work shop*** (2014) of public engagement.

  <u>Outcomes:</u> recruitment of ECR for SUPI activities, raised awareness of core team on training activities

NB During the development and delivery of these activities the university has undertaken a thorough review of PG training provision, SUPI team have contributed to consultation exercises and proposals. The PVC Sharon Huttly has chaired the review process and the SUPI steering group providing an important point of continuity.

**2) Bespoke SUPI Activity Training (objective 2)**

- **Safeguarding for EPQ:** QES the partner school provided three, Level 1, accredited safeguarding workshops. In 2015-16, ECR accessed the university safeguarding workshops, which are delivered annually by UKSRO and LUSU. The training also equipped ECR to undertake other outreach activities such as involvement in WP subject focused summer schools, and departmental outreach projects funded by WPCG e.g. Lancaster Environment Centre's Science Hunters which helped to extend the reach to more diverse group of students**.**

- **EPQ Briefing and induction:** this took a variety of formats all of which included presentation from QES staff and students to explain the purpose and diversity of EPQ projects, the roles and remit of ECR mentors, and opportunities after year 1 to learn from experienced ECR mentors.

- **EPQ Library Workshop:** although designed to enable ECR to support EPQ mentees, many reported the benefits of these workshops to their own academic study.

- **Information, Advice and Guidance (IAG):** Key facts about Lancaster and things to consider when choosing and applying to university including sources of IAG to enable ECR to signpost appropriately

- **Research in a Box development opportunities**: as appropriate and required individual shadowing opportunities, or meetings to discuss protocol or nature of involvement in facilitating the delivery of the BOX

- **Brilliant club training**: in the pilot 4 students attended intensive weekend training which has supported them in delivering 52 hours (over 4 sessions) to 40 pupils (24 KS3 reporting an increase in awareness of topic from 36% to 95% and 16 KS5 students reporting an increase in awareness of topic from 33% to 91%).

**3) Academics and Principal Investigators**

- **Briefing workshops and presentations:** exclusive RinB events, and outlining multiple SUPI opportunities at WP Network supported exchange of lessons from SUPI and for ECR and SUPI co-ordinator to become aware of issues that may influence engagement with schools tackling greater diversity of learners' and faculty based meetings designed to raise awareness of the opportunities, inform application process and offer guidance based on lessons learned;

- **Development meetings** throughout the project with individuals and groups e.g. LEC and LICA Sandpit meeting to generate ideas for example the Art and Science Masterclass.

- **Interviews** with academics as part of the research and evaluation of the project, focusing on reasons for commitment to PE and outreach, incentives and barriers associated with the PE agenda and supporting ECR to engage (see also teacher interviews).

## UNIVERSITY PERSONNEL: KEY INFLUENCERS IN STRATEGIC DIRECTION AND OPERATIONAL SYSTEMS AND SERVICES

Here we summarise the types of activities that have been instrumental in project management, raising awareness and promoting opportunities, gaining engagement from academics, and securing strategic support for sustainability, all of which were necessary for progress toward objective 1. Meetings with key personnel within:

- **Faculties** – notably Associate Deans for Research to gather baseline position, interest and ideas for engagement with SUPI, Marketing and Recruitment Managers to establish areas for collaboration (see STEM Inset), and attendance at faculty outreach network meetings to discuss RinB and other research based ideas;
- **ISS** (IT support) regarding Moodle and EPQ;
- **Library** regarding EPQ, teacher access to library resources;
- **LUSU** (Students Union) regarding safeguarding, volunteering;
- **LU TV** regarding development of video footage to promote the project and / or as resource for RinB;
- **Organisation and Educational Development (OED)** regarding ECR training and development, plus meetings to discuss institutional review of Postgraduate training (Objective 2);
- **Press office** regarding publicity and press releases relating to the project;
- **UKSRO** regarding sustainability and relocation and reconfiguration of SUPI into the SURE (School University and Research Engagement) project, plus discussion regarding their operational contributions to activities e.g. safeguarding training, student ambassador assistance with large events.


## EXTERNAL STAKEHOLDERS: KEY INDIVIDUALS AND ORGANISATIONS IN THEIR SPHERE OF INFLUENCE

Here we summarise the types of activities instrumental in raising awareness and sharing good practice about Lancaster and the wider SUPI initiative. The audience is diverse and includes: Funders, other universities especially SUPI, Schools, Professional Bodies and Families.

- **RCUK and NCCPE:** annual reports, Researchfish submissions, requests for case studies (see publications and products)
- **Other universities especially SUPI:** active participation by multiple members of the team including school representatives at the NCCPE project meetings, information exchange during and following meetings with individual SUPI notably:
  - Manchester regarding development of EPQ materials and ideas
  - Dr Jane Taylor (Academic Lead) and Luis Domingues EPQ teacher from QES were invited to speak at UEA conference
  - Southampton offering feedback regarding their School University Publication
  - Open University, Southampton, Bristol regarding Dragon's Den workshop at NCCPE Engage 2016 Conference
- **Schools:** Presentation at Cumbria Heads Dinner (2015) helped to raise the profile of the project and the distinctive nature of research focused outreach available. SUPI and other activities were publicized via

Teaching Alliances associated with the South Lakes Federation, East Lancashire Inclusion Partnership, Ripley St Thomas Academy.

- **Website** SUPI activities are well represented on the university website, these provide information about the project activities as well as links to videos and news items from previous activities. Their central location is part of the longer-term sustainability plan.
- **Families:** indirectly via school newsletters, information and ideas from their children. 136 parents and the wider community also had the opportunity to engage in activities from various RinB which were used within the Campus in the City event March 2016.

## 3: THE IMPACT AND INFLUENCE OF YOUR SUPI PROJECT

### a) Please summarise the impact(s) of your SUPI project across its lifetime

Here we report on the areas of influence on individuals, or groups of individuals, and on the activities.

**Young people target audience for objective 3:** raised awareness, enhanced achievement, note no obvious increase in recruitment

- Raised awareness of research, similarities and differences regarding school and university teaching and learning, facilities and features of a research university – via all activities, with campus visits and direct interaction with ECR appearing to be most influential;
- Enhanced achievement and overall improvement for students studying for EPQ, specific examples noted in section 2a 'EPQ', - influence of interaction with ECR on young people, library presentation and referencing resources, which also influenced teachers' confidence. There was an **increase in the average percentage of marks gained by the QES EPQ assignments** submitted as follows:
  2013: 53%      2014: 62%     2015: 64%     2016: 68%     2017: 80%
  **Average % A\*-B grades:**
  2012: 53%      2013: 48%     2014: 66%     2015: 40%     2016: 48%     2017: 73%
- School was very pleased with 2017: results A\*-B: 73% (61% of which girls, 39% of which boys) far exceeds the prediction overall for cohort which was 38% A\*-B. Four girls and one boy predicted a C exceeded expectations and came out with an A\*.
- Skill development: for students engaged in some of the RinB supporting current school study and familiarising them for future HE study (n= 1466 young people participating in 2016-17 78% reported increased knowledge of subject / specific topic, and 61% increased confidence);
- Some students reporting SUPI activities had influenced their choice of where to apply to university.

**Individual teachers target audience for objective 4:** raised awareness of research, HE courses and facilities; greater collaboration between teachers, increased confidence and renewed enthusiasm for their subject leading to curriculum changes.

- All Inset days provided stimulus for change at the level of individual practice, For instance STEM INSET 2016, on scale of 1 to 5 with 1 the highest 65% (1) and 35% (2) of the teachers rated the INSET 2016 as useful, an incremental increase on previous years. 82% of teachers participating in Religious Studies 3 Day INSET programme reported activity exceeded expectations; *"I really enjoyed the new suggestions about how to approach the Buddha's life by using two contrasting texts and getting*

*students to compare them. … I know all of these texts, but had never thought to combine them in this way"*. Teacher feedback suggests the collaborative approach and responsiveness to identifying enabling and process indicators and addressing issues was effective;

- Skill development resulting from hands on activities led to greater confidence and a desire to make curriculum changes. STEM INSET, teachers highlighted usefulness of their introduction to new resources, *"Protopedia is an amazing resource which I believe will really enable pupils to visualise protein structure and interact with them"* another highlighted benefits of meeting university staff and other teachers, *"Excellent opportunity to meet with other HODs, to discuss issues, develop ideas and resources to shape curriculum"*. Religious students indicated 78% likely to use resources and 100% would like to attend future events.
- Networking opportunities led to agreement to use common exam board, which permits greater collaboration and exchange of resources, *"simply wouldn't have happened without these INSET days"*.

**ECR:** access to training and development (objective 2), raised awareness of factors influencing PE with young people, increased confidence in working with young people, evidence for their CV and for some relevant work experience to confirm future career plans, see Case Study 1 (2015) Traps and Tweets from Britain to Brazil: Brining relevance and cutting-edge research to the curriculum. ECR explained, *"It's given me insight into how the curriculum works in school, … I have become more aware of the need for this sort of engagement"*.

**Academics:** increased awareness of school teaching and learning which is supporting activity development but also leading to increased understanding of transition issues for undergraduates, seed corn funding and / or access to network of engaged schools interested in PE relating to their research. Additional recognition of the benefits of co-ordination and importance of proactive approach that takes account of existing departmental connections. Success is dependent on the effectiveness of bilateral relationships with schools, *"It is important to find out what are teachers trying to get out of it? Are they interested in cover or expanding the horizons of the classroom? Had both with SUPI, not just the 30 min show and tell"*.

b) Please summarise any influence your SUPI project has had on your institution, its culture, or that of any other institutions, cultures and projects/initiatives.

Here we refer to the influence on Lancaster University as an institution, the schools with whom we have worked and other SUPI.

## INFLUENCE ON INSTITUTIONAL PROVISION

**Staffing:** Establishment of research PE co-ordinator post located in the central UKSRO who will co-ordinate the SURE project which retains a university wider steering group and activities developed during SUPI, notably EPQ, RinB, Brilliant Club and TURN.  Role is being funded by university Access Agreement which will support the embedding and transference of the lessons acquired from SUPI into another institutional arena and expand the reach to secondary school with greater proportion of students from a diversity of backgrounds.

**ECR training (objective 2):** established working relationship with library, UKSRO for bespoke training and lessons learned which will feed into the university wide PG training review.  Wider recognition of the benefits of training across the university includes a focus on PE and invitation to contribute to Library

'Research Bites' series. SUPI identified enabling and process indicators that influence provision and engagement in training. Challenges moving forward include the lack of central co-ordination of training and competing demands for what is core or optional with respect to training. Other agenda offer potential sources of support to build on SUPI experience, for example, Athena Swan, Research Concordat and university strategy for ECR support.

**Links with university strategy:** help to consolidate SUPI developments, for example, widening access, regional, national and international PE have potential for RinB to be shared with Lancaster's International Teaching Partners (e.g. Parasites in a Box with LU Ghana). However, there are competing and conflicting agenda, which may limit adoption of activities / ideas, for instance increase tariff and entry grades limiting teacher and subsequently student engagement by students with lower predicted grades.

**Partnership and collaboration with schools** – formal links as per QES Studio School (see section 6) resulting from positive working relationships established during SUPI, commitment to future collaboration via TURN, university access to teachers interested in research collaborations (e.g. Eyetracker research, or Physics young person working with researcher to support data analysis and teachers access to researchers). Strong baseline and appreciation of factors that influence collaborative working, already being rolled out to more Teaching School partnerships, and subject related networks, for instance Computer At School (CAS network), RE network growing out of INSET linked to the RinB Mahabharata in a Box.

**Myths busting, cultural and organizational awareness:** key influence of the close working relationship is change in perceptions based on increased awareness of others working context, see section 2b for working in partnership and operational considerations. Clear benefits of having connections with established committees and support from senior colleagues, however, as noted in interviews with academics there is an ongoing challenge to keep public engagement at the forefront of wider agenda, external levers such as research funders requiring clear evidence of PE in proposals is proving useful.

**Information exchange and lessons learned:** during and following SUPI network meetings we have identified and shared activities and materials which has saved both development time and avoided us having to 'learn the hard way' e.g. shared ideas with Southampton for their guidebook working with schools drawing on ideas for our own work, exchanged information with Manchester and OU re EPQ.  Without project funding access to annual NCCPE ENGAGE or similar networks may be lost which is a potential risk moving forward.

## 4: PUBLICATIONS AND PRODUCTS

a) Please list any publications that have resulted from your SUPI project

Our publications, products and dissemination activities are grouped together under five headings.

### CASE STUDIES

2014: Case Study 1 - *Inspiring the next generation: Liberating the teacher to empower the pupils as researchers*. Edited version available at: https://www.publicengagement.ac.uk/case-studies/liberating-teacher-empower-pupils-researchers

2014: Case Study 2 - *Inspiring the next generation: Building Student Council's Capacity to Research Teaching and Learning* Available at: http://wp.lancs.ac.uk/reap/files/2017/04/14-RCUK-SUPI-Lancaster-Case-Study-2.pdf

2015: Case Study 1 - *Inspiring the next generation: Traps and Tweets from Britain to Brazil* Available at: http://wp.lancs.ac.uk/reap/files/2017/04/15-RCUK-SUPI-Lancaster-Case-Study-3.pdf

2015: Case Study 2 - *Inspiring the next generation: Pass it on - The mutual benefits of collaborative INSET* Available at: http://wp.lancs.ac.uk/reap/files/2017/04/15-RCUK-SUPI-Lancaster-Case-Study-4.pdf

2016: Case Study 1 - *Inspiring the next generation: Art and Science Masterclass case study* Available at: http://wp.lancs.ac.uk/reap/files/2017/04/16-RCUK-SUPI-Art-and-Science-masterclass-Case-Study-5.pdf

2016: Case Study 2 - *Inspiring the next generation: From desk to a virtual world - SUPI Research Project Administrator case study* Available at: http://wp.lancs.ac.uk/reap/files/2017/04/16-RCUK-SUPI-From-desk-to-virtual-world-SUPI-Project-Administrator-Case-Study-6.pdf

2017: Case Study 1 -*Inspiring the next generation: INSET: Sowing seeds and growing an network to inspire the next generation* Available at: http://wp.lancs.ac.uk/reap/files/2017/04/17-RCUK-SUPI-INSET-Growing-a-network-Lancaster-Case-Study-7.pdf

2017: Case Study 2 - *Inspiring the next generation: Teachers as researchers* Available at: http://wp.lancs.ac.uk/reap/files/2017/04/17-RCUK-SUPI-Engaging-Teachers-in-Research-Lancaster-Case-Study-8.pdf

## NEWS AND EVENTS

Dallam School (2015) Dallam students carry out DNA Lab Work with Lancaster University staff: News. Available at: http://www.dallam.eu/dallam-students-carry-out-dna-lab-work/232739.html

Lancaster University (2013) *Science and Technology Taster Day: News*. Available at: http://www.lancaster.ac.uk/sci-tech/news/001801/science-and-technology-taster-day-2013 [Accessed 2014]

Lancaster University (2013) *Lancaster University inspires the next generation of researchers: News.* Available at: http://www.lancaster.ac.uk/business/public-engagement-/lancaster-university-inspires-next-generation-of-researchers/

Lancaster University (2013) *SLF-Lancaster Chemistry Competition: News.* Available at: http://www.lancaster.ac.uk/chemistry/news-and-events/news/2014/slf-lancaster-chemistry-competition/

Lancaster University (2014) *Cumbria sixth formers gain insight into research: News.* Available at: http://www.lancaster.ac.uk/news/articles/2014/cumbria-sixth-formers-gain-insight-into-research/

Lancaster University (2014) *South Lakes Federation- Lancaster University Chemistry Competition: News.* Available at: http://www.research.lancs.ac.uk/portal/en/clippings/south-lakes-federation-lancaster-university-chemistry-competition(43f3e8e4-5f7f-4bb0-bce9-b9b2f96ae31c).html

Lancaster University (2014) *Forty South Lakes Science teachers visit the faculty: News*. Available at: https://www.lancaster.ac.uk/chemistry/news-and-events/news/2014/forty-south-lakes-science-teachers-visit-the-faculty/ and http://www.physics.lancs.ac.uk/news/002300/slfrcuk-teachers-inset-day

Lancaster University (2015) *Arts and Science Masterclass*: Events. Available at: http://www.lancaster.ac.uk/teachers/rcuk-schools-university-partnerships-initiative/recent-events/

Lancaster University (2016) Campus in the City included showcasing Eyetraker, Factory and Moot Court in a Box, Available at: https://campusinthecity.com/2016/07/18/campus-in-the-city-iii-2016/

Wilkinson, A. (2015) Collaborative approach to school-university partnerships. *National Co-ordinating Centre for Public Engagement Blog*. Available at: https://www.publicengagement.ac.uk/blog/collaborative-approach-school-university-partnerships

Wilkinson, A. (2016) Attempting the impossible? Post-graduate research and school leadership, *National College for Teaching and Leadership Blog*.  Available at: https://nctl.blog.gov.uk/2016/01/15/attempting-the-impossible-post-graduate-research-and-school-leadership/

Young-Powell, A. (2017) *Murder mystery to DNA: researchers bring science to life in schools* The Guardian Teacher Network (10.03.2017) Available at: https://www.theguardian.com/teacher-network/2017/mar/10/science-schools-universities-research-partnerships

## KEYNOTES, PRESENTATIONS AND WORKSHOPS

Houghton, A. (2014) *The researcher as teacher*, Research in an inclement climate: How to thrive and survive as a researcher in the 21st Century, Lancaster University.

Houghton, A. (2016) *Teacher research: voyages of discovery: Keynote.* 2nd Annual ELSSA Teacher Research Conference in collaboration with East Lancashire Inclusive Partnership, (June 2016).

Houghton, A. (2016) *Students and Researchers: Partnerships for mutual benefit Plenary, Engage Conference 2016.* National Co-ordination Centre for Public Engagement.

Taylor, J. (2016) *Does the Extended Project Qualification prepare students for tertiary level research?*' Invited speaker at HUBS Workshop: Exploring the research experience of our students, UEA, Norwich.

Taylor, J. (2015) *Engaging with Communities*: Slides. Available at: http://imagination.lancs.ac.uk/sites/default/files/news_downloads/15_oed_event_-_engaging_with_communities.pdf

Taylor, J. (2016) The Dragon's Den of School Partnership Sustainability, part of collaborative SUPI workshop *Engage Conference 2016.* National Co-ordination Centre for Public Engagement.

Wild, J. and Hardaker, C. (2013) 'What is research?' Queen Elizabeth School: Research Inset Day (October).

Wilkinson, A. (2014) *School and University Partnership: A school's perspective*, November 2014 SUPI Network Meeting.

Wilkinson, A. (2016) *Benefits of School University Partnership*, Ripple Conference

Wilkinson, A. (2016) *A tale of 3 projects …. Closing the Gap – NCTL. Evidence-Based teaching – NCTL. Research Council UK- School and University Partnership Initiative*: Slides Available at: https://www.lancaster.ac.uk/media/lancaster-university/content-assets/images/schoolscollegeliaison/ATeachersExperienceofHE.pdf

## INTERNAL REPORTS

Baxendale C., Bryan S. with Houghton, A. (2016) *Research in a Box*, (Evaluation Summary Report), Lancaster University. [Distributed on Lancaster's WP Network Moodle site]

## TEACHER RESEARCH REPORTS

East Lancashire Learning Partnership's Teacher Research Reports (TRR) are available at: http://www.elip.org/continuing-professional-development/research-findings/teacher-research-programme-reports

# Duxbury, Melling, Mitchell, Taylor and Whittaker also presented their papers at the conference June 2016.

# Duxbury, G. (2016) *TRR6: Is therapeutic play a successful tool to aid learning and increase a child's potential within a special needs school?* East Lancashire Learning Project.

Fotheringham, J. and McCrone, G. (2015) *TRR1: Measuring the impact of embedded sensory interventions on the Behaviour of a Student with Autistic Spectrum Disorder, Complex Learning Difficulties and Challenging Behaviour*. East Lancaster Inclusion Partnership

Jones, M. (2016) *TTR4: The use of a real audience to inspire lower attaining students to re-draft, proofread and edit writing*. East Lancaster Inclusion Partnership

# Melling, E. (2016) *TTR5: The influence of work-based learning within post 19 provision on the employability opportunities for SLD learners*. East Lancashire Learning Partnership

# Mitchell, J. (2016) *TTR3: Exploring the role of forest schools in secondary schools: A case study*. East Lancaster Inclusion Partnership

Reeves, J. and Houghton, A. (2015) *TRR2: Sustained, shared thinking*. East Lancashire Learning Partnership

# Taylor, K. (2016) *TRR 7*: *Embedding teacher research into school culture: a case study* East Lancashire Learning Project.

# Whitaker, R. (2016) TRR 8: *How does involvement in action research help to develop the role of support staff working with pupils with multi-sensory impairment*? East Lancashire Learning Partnership

Wilkinson, A. (2015) *Creating a culture of evidence-based teaching: gardening not manufacturing,* National College for Teaching and Leadership

Wilkinson, A. (2017) *Evidence-based teaching: advancing capability and capacity for enquiry in schools Case study* April 2017 The South Lakes Teaching School Alliance, National College for Teaching and Leadership.

## ORIGINAL RESEARCH IN A BOX

The following boxes were developed and funded by RCUK-SUPI with continuity funding provided by Lancaster's Widening Participation Co-ordinating Group as part of its Access Agreement outreach activities.

**PCR in a Box (Jane Taylor, LEC, FST)** Designed for A-Level Biology students 'PCR in a Box' contains all the high-tech equipment needed to perform a PCR (Polymerase chain reaction) and gel electrophoresis used in gene sequencing in a Box. http://www.lancaster.ac.uk/teachers/rcuk-schools-university-partnerships-initiative/research-in-a-box/pcr-in-a-box/

**Eye Tracker in a Box (Michelle To, Psychology, FST)** Designed for A-Level Psychology students, 'Eye Tracker in a Box' explores how eye movements are linked to psychological processes. It raises teachers and students awareness of the importance of eye movement research, showcases how eye-tracking can be used to investigate various aspects of psychological processes e.g. measuring eye movements and provides hands on experience of the technique. http://www.lancaster.ac.uk/teachers/rcuk-schools-university-partnerships-initiative/research-in-a-box/eyetracker-in-a-box/

**Factory in a Box (Stephen Quayle, Engineering, FST)** This box contains 3D printer and scanner for use in a variety of STEM and non-STEM lessons. There is an extremely broad scope to cover many different areas of the curriculum and for use with A-Level students interested in studying Engineering, Maths, Physics, History and Design. http://www.lancaster.ac.uk/teachers/rcuk-schools-university-partnerships-initiative/research-in-a-box/factory-in-a-box/

**Photonics in a Box (Robert Young and Harald Fox, Physics, FST)** A-Level Physics students learn about non-invasive blood flow monitoring using laser speckle; optical fibres and networks: splicing, joining, connectorising, bandwidth, hacking and secure quantum encryption; simulation of a quantum computer, with 'Photonics in a Box'. http://www.lancaster.ac.uk/teachers/rcuk-schools-university-partnerships-initiative/research-in-a-box/photonics-in-a-box/

**Radicalisation engagement in a Box (Matthew Johnson, PPR, FASS)** Students have the opportunity to discuss anti-radicalisation through role plays and debates with 'Radicalisation engagement in a Box'. This Box fosters an interest for students wanting to study Politics and Citizenship.  It increases awareness among teachers and students of university level research and teaching methods, the causes of radicalisation and need to discuss and examine these issues safely. http://www.lancaster.ac.uk/teachers/rcuk-schools-university-partnerships-initiative/research-in-a-box/radicalisation-engagement-in-a-box/

**Moot Court in a Box (Ben Mayfield and Siobhan Weare, Law, FASS)** Potential to cover different areas of the curriculum 'Moot Court in a Box' can be used in PSHE, General Studies or Extended Project Qualification (EPQ) classes. 'Mooting' and the running of a 'mock trial' allows students to examine legal issues, historical issues and current affairs through the lens of a courtroom argument. Students develop skills including: public speaking, critical analysis, research. http://www.lancaster.ac.uk/teachers/rcuk-schools-university-partnerships-initiative/research-in-a-box/moot-court-in-a-box/

## WIDENING PARTICIPATION BOXES

The following boxes were funded by Lancaster's Widening Participation Co-ordinating Group as part of its Access Agreement outreach activities, but their development and co-ordination was undertaken as part of the RCUK-SUPI project. As such, they represent a distinctive commitment to the wider RCUK – SUPI desire to "reach secondary school students from a diversity of backgrounds and abilities and engage the widest possible range of teachers and schools in ways which have maximum impact on teaching quality and learning". The research topics help to provide relevance and the researchers and ECR are also able to share their own diverse backgrounds which helps to signal university commitment to widening access.

**Design in a Box (Roger Whitham, Imagination Lancaster, FASS)** A web based Box to engage students in exploring their material world and the meaning, values and intents embedded in designed products, services and their interactions. It is designed for use in DT, PSHE and Citizenship classes. http://www.lancaster.ac.uk/teachers/rcuk-schools-university-partnerships-initiative/research-in-a-box/design-in-a-box/

**Rethinking disadvantage in a Box (Matthew Johnson, PPR, FASS)** This project seeks to enable GCSE and A Level students from WP backgrounds to reflect upon and understand the political processes which have contributed to their being disadvantaged. It is designed for use in Citizenship classes. http://www.lancaster.ac.uk/teachers/rcuk-schools-university-partnerships-initiative/research-in-a-box/disadvantage-in-a-box/

**Observation in a Box (Sue Ward and Ali Birkett, LEC, FST; Gerry Davies and Sarah Casey, LICA, FASS)** Building on a number of links between drawing, science and the environment 'Observation in a Box' will promote skills in looking and recording, critical judgement, taxonomy and, the ability to use identification keys. It is designed for use in Art and Biology classes.

**Parasites in a Box (Michael Urbaniak and Rod Dillon, BLS, FHM)** Audio, images, tactile representation of important unicellular parasites, and live (non-infectious) parasites and resources to explain what a parasite is, how they are spread, how they cause disease and current therapies. It is designed for use in Biology and Citizenship classes.

**Diet in a Box (Beccy Whittle and Beth Brockett, LEC, FST)** Students have to design a diet using information on the UK Recommended Daily Amount of fibre, protein etc., and environmental, social, cultural, economic and political concerns. It is designed for use in Geography, PSHE and Citizenship.

**Health inequalities in a Box (Jenny Irvine, Health and Medicine, FHM)** A snakes and ladders inspired game for groups of four students to explore the issues involved in health inequalities. It is designed for use in Careers and Citizenship classes. http://www.lancaster.ac.uk/teachers/rcuk-schools-university-partnerships-initiative/research-in-a-box/health-inequalities-in-a-box/

**Turning points in Physics in a Box (Chris Arridge, Physics, FST)** Boxes containing the equipment to carry out seminal experiments that proved to be turning points in our understanding of the physical world. It is designed for use in Physics classes. http://www.lancaster.ac.uk/teachers/rcuk-schools-university-partnerships-initiative/research-in-a-box/turning-points-in-physics-in-a-box/

**China in a Box (Astrid Nordin, PPR, FASS)** This box is designed to help teachers integrate China in the curriculum or in enrichment activities. Most of the box is digital, so teachers can deliver classes on their own, although linked visits for local schools are also possible. It contains a set of three classes designed to fit the Geography GCSE Global Cities element, including a comparison of Shanghai and Liverpool. http://www.lancaster.ac.uk/teachers/rcuk-schools-university-partnerships-initiative/research-in-a-box/china-in-a-box/

## NEW BOXES

The following boxes have just been commissioned and will be funded alongside the maintenance and distribution of all existing boxes by Lancaster's Widening Participation Co-ordinating Group as part of its Access Agreement outreach activities. Using Access Agreement funding provides sustainability, several of the boxes cover equality related agenda and from an inclusive curriculum perspective have the potential for increasing relevance to a more diverse student population.

**Mahabharata in a Box (Brian Black, PPR, FASS)** Teaching resources for teaching Hinduism at GCSE and A levels. The resources will support teachers in the teaching new GCSE and A level specifications and will use dialogues and other examples from the Mahabharata to explore terms, such as *dharma, karma, bhakti, atman, Brahman, yoga, samsara, moksha,* and *varna* (caste), or specific teachings or themes on the syllabi; such as the four aims of life, the four stages of life, non-violence, Hindu pluralism, gender, Hindu conceptions of the divine, Hindu ethics, Hindu conceptions of nature and the environment.

**Sherlock in a Box (Maria Christou, English and Creative Writing, FASS)** 'Sherlock in a Box' will introduce students to a shift in the conventions and assumptions of the detective genre, from classic detective stories to the postmodernist versions of the genre; through the use of role plays and a computer app.

**Being black: history in a Box (Sarah Barber, History, FASS)** Black History in a Box is designed to help teachers identify how they can give weight to the narratives of actors of colour who have little control over constructing their history.

**Colorimetric analysis in a Box (Rachel Bashford, Chemistry, FST)** The portable UV-vis spectrometers will link to three different key stage activities linked to Geography, Art and Human Biology.  Students will learn how to produce an absorbance spectrum, a calibration curve and determine the quantity of a substance in a solution and relate results to real life applications.

**Women and sound in a Box (Linda O'Keefe, LICA, FASS)** The aim of the box is to **first**, make practical interventions into the current pedagogical apparatus for the teaching of sonic technologies in schools, and **second**, to interrogate and generate the construction of virtual and physical sites of knowledge exchange on gender, sound and technology.

**Business in a Box (Rebecca Heron, Nigel Lockett and Magnus George, Enterprise, LUMS)** This Box will support teachers delivering section 3.1.1 (The purpose and nature of businesses) of the AQA GCSE curriculum, Business in the real world.  It will employ downloadable learning resources including video, directed case studies for individual and team activity and help raise students' awareness of the role of the entrepreneur within modern economies.

## VIDEOS

Lancaster University (2015) *Queen Elizabeth School*: RCUK SUPI partnership with Lancaster University. Available at: https://youtu.be/XpdUNg_0R6o

Lancaster University (2015) *Art-Science masterclass with Sarah Bellwood*. Available at: https://youtu.be/-3jk4v7NiXI

Lancaster University (2016) *Art and Science Masterclass 2016*. Available at: https://youtu.be/SLrnhmk7RBM

Lancaster University (2016) *Radicalisation engagement in a Box*. Available at: https://www.youtube.com/watch?v=1bzOuxS-fFs

Lancaster University (2016) *PCR in a Box*. Available at: https://www.youtube.com/watch?v=sbrGGE6Zk9A

Lancaster University (2016) *Parasites in a Box*. Available at: https://www.youtube.com/watch?v=tF6B-dMamM0

Lancaster University (2016) *Diet in a Box*. Available at: https://www.youtube.com/watch?v=MxARM4DD3hE&t=4s

Lancaster University (2016) *China in a Box*. Available at: https://www.youtube.com/watch?v=lLPHZzTMqVc

Lancaster University (2016) *Rethinking disadvantage in a Box*. Available at: https://www.youtube.com/watch?v=ijWc1boql68


## 5: AWARDS AND RECOGNITION

Please list any awards or recognition associated with your SUPI project

Lancaster applied to the NCCPE Engage Competition 2016 and was shortlisted.

British Ecological Society Public Engagement Award Winner Dr Ali Birkett won an award for her PE activities which included SUPI activities of Researcher in Residence, Art and Science Masterclasses

## 6: COLLABORATIONS AND PARTNERSHIP

Please provide details of any significant collaborations and partnerships that have resulted from your SUPI project

### QUEEN ELIZABETH SCHOOL, KIRKBY LONSDALE

There is a strong working relationship at senior strategic and operational level between multiple sections of the university and QES. Lancaster and the SUPI was referred to in:
- Application for Research School status
- Application for Studio School status which opens in September 2017, funding has already been allocated for CETAD to access CPD
- Ongoing commitment to SUPI activities that will be continued under the SURE project

The Headteacher at QES believes the collaboration with researchers from Lancaster University "is *one of the most significant ways we have been able to build capacity and expertise around research in schools and has led to staff undertaking bespoke doctorate programmes, the creation of a Knowledge Exchange network and participation in a range of research activities*".

### SOUTH LAKES FEDERATION (SLF) AND OTHER TEACHING ALLIANCES

Steve Houghton, South Lakes Federation, and Alison Wilkinson, Headteacher QES, who leads the Research and Development Group, are actively involved in exploring additional approaches for enabling school staff to participate in Lancaster's Teacher University Research Network (TURN).

- East Lancashire Inclusion Partnership (ELIP) There remains interest in the model of support for teachers undertaking small scale action research, continuation is currently dependent on securing funding for ECR. To date, we have held initial discussion with (ELIP) schools about possible sources of funding.
- Teacher University Research Network (TURN) Opportunities this provides will be rolled out to individual schools, Teaching Alliances – previous attendees from ELIP, the Ripley Teaching Academy, and Loyne Specialist School part of the Lancashire Special School Network have all expressed interest in TURN.

## SUPI UNIVERSITIES

Although we have no formal links we anticipate remaining in touch with colleagues at UEA, Manchester, OU and Southampton whose projects or staff we have shared ideas with during the project.

Our evaluator was approached and agreed to act as Associate Editor for the new public engagement journal **Research for All** which we anticipate will support ongoing engagement with university colleagues.

## 7: FURTHER FUNDING

Please list all further funding that your SUPI project has leveraged across its lifetime

### EXTERNAL

East Lancashire Inclusion Partnership – 'in-kind' £500 bursaries paid to 8 teachers and 5 individual schools releasing teachers for total of 5 days / teacher (Total 40 days) to participate in workshops at Lancaster.

QES 'in-kind' support for safeguarding training in 2014, 2015 and 2016 including Level 1 accreditation.

South Lakes Federation – 171 teachers participating released for Inset to participate.

RCUK, Joint 'Bringing Cutting Edge Science to the Classroom' Programme/SUPI activity funding for CPD event at Lancaster University £5000 (2015).

Sarah Bellwood / LICA 'in-kind' participating in two Art and Science masterclass.

### INTERNAL

LU Friends Programme, Teaching and Learning Boxes for Schools £5585 to purchase experimental kit to take out to schools. (2015)

Widening Participation Co-ordinating Group: LU OFFA eligible expenditure Research in a Box £43,000 (2015)

Widening Participation Co-ordinating Group: LU OFFA eligible expenditure £53,664 (to end July 2017)

FST Recruitment and Outreach Team 'in-kind' support regarding time involved in organising the STEM inset days in 2014 to 2016

FASS Recruitment and Outreach Team 'in-kind' support regarding liaison with depts. to organise the Arts and Humanities Inset Day in 2015.

UKSRO 'in-kind' support for launch and celebration conference in form of Student Ambassadors, promotional material and event management advice

UKSRO 'in-kind' support for safeguarding training for ECR involved in EPQ in 2016

Library 'in-kind' support with four workshops (two for teacher researchers and two for ECR involved in EPQ)

The development and co-creation of individual Research in a Box involved 'in-kind' support from university staff and teacher. The ECR / PhD students were generally paid for their work in producing resources and delivering activities.

## 8: SKILLS AND PEOPLE

### a) Please list any skills related developments that have taken place as part of, or as a result of your SUPI project

Inevitably this is a summary, see also case studies that highlight influence on teachers, ECR, SUPI co-ordinator, University staff as well as young people.

### PUBLIC ENGAGEMENT

- Ideas and insights gained from the NCCPE facilitated RCUK-SUPI project meetings have enhanced existing PE experiences of the core Lancaster team including PI, Administrator and Evaluator. Activities integrated into the meetings, but also the 'market place' where there were opportunities to learn and share PE experiences with other universities.
- ECRs training actively promoted and enabled 66 participants to reflect on existing PE strategies and consider the importance of enthusiasm, relevance, language / terminology, communication, planning and preparation to target PE to the intended audience.
- Academics as well as ECRs have gained in their appreciation of the school curriculum, facilities, working environment and the need to ensure they clarify assumptions about academic level and language / terminology used.

### DIGITAL AND COMMUNICATION SKILLS

Although all administrators and core staff have confidence in using technology including specialised software, the project has involved some in developing skills in:

- **Moodle Development** including for example, the design of resources to support EPQ, the requirements that need to be in place to ensure safeguarding, encourage engagement;
- **Webskills for dissemination of the project** and to publicise the growing number of resources has involved two of the administrators acquiring web skills to access and enter information on the **web content management** system.

- The project has provided all administrators who had research experience with the opportunity to gain experience and confidence in using **administrative systems and processes** relating to finance, staffing, event management that were part of their administrator's role.
- The project with its active encouragement and focus on engagement has result in development of communication skills e.g. writing press release, instructional / pedagogical learning material, speaking to camera.

b) Please list any secondments placements and internships to or from other organisations associated with your SUPI project

### RESEARCHER IN RESIDENCE

Dr Ali Birkett who undertook a term's placement as a researcher in residence that included in class support for Biology lessons, the loan and use of university equipment and communication with pupils and the school during her field trip to Brazil. During her placement, she also facilitated other PhD students' visits to the school. Ali also received the British Ecological Society Public Engagement Award (2016).

Although secondments were referred to in the original proposal, there was only one formal researcher in residence (see 2015 Case Study 2). Whilst valuable, the practicalities and logistics of regular travel, the time constraints, changing school context and alternative priorities of the RCUK-SUPI steering group meant the researcher in resident role was not repeated.

## 9: OTHER

Please state here any other information associated with your SUPI project that you would like RCUK to know as part of final reporting.

Journal articles – we have two articles in preparation with provisional titles:

- School University Partnerships as a sustainable third space: The revaluation of professional practice through teacher research
- Academic engagement with School University Partnerships: An exploration of the challenges, choices and chances to inspire the next generation of researchers

The NCCPE facilitated SUPI network meetings provided a regular and important opportunity to collaborate with other SUPI projects, they also included a range of interactive activities some of which we have been able to adopt and adapt.

To cite this work:

Houghton, A-M., Taylor, J. E., Wilkinson, A., Baxendale, C., Bryan, S., Huttly, S. (2018). Inspiring the next generation: The RCUK School-University Partnership Initiative (SUPI) summary report. The RCUK School-University Partnership Initiative (SUPI). Lancaster, Lancaster University School-University Partnership Initiative.