

**RCUK Public Engagement with Research: School-University Partnerships Initiative**  
**Year 2 Annual Report covering the period 1<sup>st</sup> January 2014 until 31<sup>st</sup> December 2014**  
**Engaging Opportunities: Connecting young people with contemporary research and researchers**  
**The Open University and The Denbigh Teaching School Alliance**

<p><b>Progress against call aims</b></p> <p>This is the second Annual Report for ‘Engaging Opportunities’, a three-year (2013-2015) action research project, involving a partnership between The Open University (OU) and the Denbigh Teaching School Alliance (DTSA).<sup>1</sup> Our core aims for this partnership are: to create a culture of reflective practice around school-university engagement with research; and to embed school-university engagement with research within the OU’s and DTSA’s strategic planning on a sustainable basis. These aims were designed to complement RCUK’s aims for SUPI. In Year 2 we have continued to work collaboratively across the nine Central Academic Units within the OU. In Year 1 the OU established an effective working relationship with Denbigh Teaching School leading the Teaching School Alliance. One of our objectives has been to expand the reach of ‘Engaging Opportunities’ to include a greater number of DTSA secondary schools and colleges.</p> <p>Progress in Year 2 aligns closely with progress against the project objectives as outlined in our Year 1 report (listed there under ‘Progress against call aims’). By the end of the project<sup>2</sup> we will have brokered opportunities for direct engagement between OU researchers and at least 3,800 students from across Milton Keynes and the surrounding area. In Year 2, we have directly engaged at least 1338 people,<sup>3</sup> almost exclusively local school students, but also involving OU researchers, teachers, parents and other interested publics. Added to our Year 1 figure (750 people), we have directly engaged 2088 students, teachers and parents from Milton Keynes<sup>4</sup> with OU research and researchers over the first 24 months of the project.</p>
<p><b>Progress against your objectives</b></p> <p><b>Project Management</b></p> <ol style="list-style-type: none"> <li>1. Dr. Richard Holliman has been co-opted as a member the DTSA Strategic Board and the OU/Brilliant Club Working Group, respectively.</li> <li>2. We have maintained membership of the core project team, including dedicated staff from the OU and DTSA (see <a href="#">profiles</a>). We had a small turnover of staff due to retirements (Liz Whitelegg and Steve Swithenby, OU) and career progression (Andy Squires became Head Teacher of Denbigh School). We have recruited replacements for these core staff (Dr. Vic Pearson, OU, has responsibility for equality and diversity; Prof. Nick Braithwaite is Director of eSTeEM, see below), and Helen Brown (Assistant Headteacher, Denbigh School) provides strategic leadership perspective on behalf of the DTSA. Janice Ansine joined the team bringing expertise through her work on citizen inquiry initiatives. We employed an intern, Jessica Carr, for four weeks over the summer during a particularly busy period for our SUPI.</li> <li>3. The ‘Engaging Opportunities Strategy Group’ meets on a monthly basis, recording minutes of meetings. A sub-set of core staff from the team continues to meet regularly to discuss operational issues.</li> <li>4. <a href="#">Helen Brown</a> (Visiting Fellow) was granted OU ‘visiting’ status, giving her routine access rights.</li> <li>5. The project continues to be hosted in the cross-Faculty, multi-disciplinary <a href="#">eSTeEM</a> research centre with dedicated support from a Project Manager (Diane Ford). Prof. Nick Braithwaite routinely attends the Strategy Meetings. Working with Vic Pearson, Prof. Braithwaite was instrumental in supporting our SUPI’s proposal under RCUK’s Cutting Edge Research in the Classroom Initiative (see below). eSTeEM have funded a number of project-related expenses that were not covered by the RCUK SUPI scheme.</li> <li>6. We have continued to work with the OU’s Human Research Ethics Committee, gaining approval for all the interventions discussed in the section on monitoring and evaluation.</li> <li>7. Dr. Richard Holliman supported <a href="#">Dr Gareth Davies</a>’ successful application to become an NCCPE Public Engagement Ambassador, based on his SUPI work. A further OU academic joined the scheme on the basis of his school-university engagement, <a href="#">Professor Andrew Norton</a>.</li> <li>8. Dr Richard Holliman mentored a postgraduate researcher (PGR), <a href="#">Dr Leanne Gunn</a>, as she developed and evidenced the skills and competencies required in project management to become a professional science communicator with a particular focus on engagement with schools and young people.</li> </ol>

<sup>1</sup> This report is authored by Richard Holliman (OU), Gareth Davies (OU), Mark Russell (DTSA) and Victoria Pearson (OU). The case studies were authored by: Trevor Collins, Peter Devine, Richard Holliman (OU) & Mark Russell (DTSA); and Mairi Walker and David Martí Pete (OU).

<sup>2</sup> The final data for the Engaging Opportunities project will be based on the 2015/2016 programmes of open lectures and open dialogues. These programmes will be complete by July 2016.

<sup>3</sup> This figure for Year 2 does not include online engagement, e.g. with the Science Matters lectures. By December 2014 the archived recordings of [2013 Science Matters](#) lectures had been accessed 3416 times from more than 40 countries, spanning six continents.

<sup>4</sup> We have not included data from engagement with schools outside the DTSA.

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**Communication: research with young people at the centre**

We continue to face similar changes in Year 2 to those we faced in Year 1: 1) the lack of profile for school-university engagement has required that we raise awareness of RCUK-funding for SUPI within the OU & across the DTSA, but without raising expectations giving the limited funds & support we could offer;<sup>5</sup> 2) working to promote quality school-university engagement, therefore making strategic & operational judgements about quality & performance;<sup>6</sup> and 3) to better understand existing school-university activity across the OU (see monitoring and evaluation).

These challenges are ongoing and are likely to be live issues across the 'SUPI family'.<sup>7</sup> With these challenges in mind, we have introduced the following communication and engagement strategies in Year 2:

1. The project continues to be led by the OU's Champion for Public Engagement with Research, Dr. Richard Holliman. In Year 2 he continued to report SUPI-related issues directly to the OU's Pro Vice-Chancellor (Research, Scholarship and Quality), also connecting the project with the Deans, Associate Deans for Research and Research Centre Directors.<sup>8</sup>
2. We made efforts in Year 2 to increase the number of schools we engage with. For example, several schools took part in a research café at Denbigh School, anticipating they might be interested in other activities. Two schools attended, and they have subsequently run activities and actively sought out more opportunities to engage. We also produced leaflets about the project activities, which were sent to head teachers. Mark Russell also attended a Science Networking Meeting for Heads of Faculty, and Richard Holliman presented at the DTSA Head of 6th-form meeting. (We have focused our promotion around activities that are easier for schools to run, e.g. lectures.)
3. We continue to invite contributions from researchers, but our assessment process has changed. We now invite written submissions to the team on a rolling basis. Once the submission is in a format ready for detailed discussion the academics are invited to present their idea at one of the routine monthly project meetings, resulting in discussion and further refinement. Several open inquiry activities are currently 'active' within this process, e.g.: [MK: Smart 'Appathon'](#); [Juxtalearn](#); [Virtual Skiddaw](#); [Earth in Vision](#); and [Floodplain Meadows](#).
4. We have worked with media professionals, now based in eSTeEM, and OU graphic designers, the latter now based in the OU's Institute of Educational Technology, on Open Creativity activities.
5. We have analysed the data from the baseline evaluation survey (see monitoring and evaluation) to explore current attitudes towards engaged research, and to identify existing activity in this area.
6. Our main OU and public presence and channel for dissemination is the OU's Engaging Research wordpress blog (e.g. [School-University lectures](#))<sup>9</sup>, but we have also communicated our work through the DTSA App and the Denbigh School Newsletter. We use these channels for OU researchers, and DTSA students and teachers, to promote events and showcase activities (e.g. [Code breaking challenges](#)). In total, we have commissioned and edited 16 posts in Year 2 for the blog that showcase aspects of the 'Engaging opportunities' partnership. Wherever possible, we are using a mixed media approach in our communication work. We continue to have a presence on twitter, mainly through @science\_engage and @Denbigh\_TSA using the hashtags #SUPI, #RCUK and #Engagingopportunities.
7. We have an Engaging Research seminar series, which we record. The following seminar could be of interest to the wider 'SUPI family', NCCPE and RCUK: [Gareth Davies & Richard Holliman](#) on evaluation.

<sup>5</sup> Funding for school-university engagement continues to be a significant challenge. University and school resources are stretched, and other external sources of funding tend to be very limited. (We have worked with researchers on several research proposals; none have been funded.) Furthermore, we have received mixed feedback from OU researchers on whether school-university engagement is being assessed as a legitimate and equivalent pathway to research impact, when compared to other pathways.

<sup>6</sup> Anecdotal evidence suggests this may be a sector-wide issue. As an example, [Dr Holliman](#) worked as a judge on the NCCPE's Engage Competition. Working with other judges he assessed the finalists in the school-university engagement category. Following unanimous agreement none of the finalists were put through to the final assessment where the overall winner of the competition would be decided.

<sup>7</sup> By 'SUPI family' we mean the 12 RCUK-funded SUPI projects, the NCCPE as coordinators of this network, and the RCUK PER team.

<sup>8</sup> Another challenge for the SUPIs is turnover of staff in senior management positions. Following the REF submission several faculties changed their Associate Deans for Research. Furthermore, the OU's support structures for research are changing with the loss of Research Centres. More recently, the PVC, RSQ took on the role of Acting Vice-Chancellor, subsequently taking on a new challenge as Vice-Chancellor of Middlesex University. The result of this routine turnover of staff and organisational change is a lack of continuity for the project alongside some confusion about structures and lines of reporting, requiring further investment of time on the part of the PI to raise the profile of the project.

<sup>9</sup> The OU's WordPress platform is undergoing an upgrade to improve functionality and analytics. The aims of this upgrade are: to improve OU branding for school-university engagement; to ensure that academics can routinely draw on relevant metrics to support applications for external funding; and to inform academic workload planning for these activities.

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8. Staff from our SUPI contributed to NCCPE-organised, 'SUPI family' meeting in London (12 Nov. 2014), 'Collaborating for Success: Inspiring Inquiring Minds', which was a forum for discussing the benefits and issues associated with school-university partnerships. Gareth Davies and Helen Brown led a session ('How was it for you? An exchange of teacher and researcher evaluation know-how'), which has led to discussions with Claire Wood (NCCPE) about more social space around the coordination meetings.
9. Two OU academics presented at the International Public Communication of Science and Technology (PCST) Conference in Brazil (5-8 May 2014) on behalf of the wider project team.<sup>10</sup>
10. We have recorded outputs from our SUPI in the RCUK Researchfish database.

**Activities: facilitating lifelong engagement with research**

We have continued to use the framework of four types of activities as a way of framing our interventions:

**Open Lectures:** The second jointly organised OU/D TSA open lecture programme started in Autumn 2014. OU and DTSA staff planned the programme, recruiting OU researchers in the process. Our aim in Year 3 is to further extend the pool of lecturers and to get other schools interested in hosting lectures.

In Year 2 18 lectures and 3 introductory briefings were delivered, at: Denbigh School; Stantonbury School; St. Paul's School; Walton High, MK College; and the Open University, the latter as part of the [2015 Science Matters](#) event.<sup>11</sup> 12 of the lectures were delivered by OU researchers. In total, the lectures have been delivered directly to 1069 people (almost exclusively students from across Years 7-13). In addition, we received 14,546 pre-event hits on the promotional site for the 2014 Science Matters lectures, and 326 live connections.<sup>12</sup> As of 30/01/15 we've had a further 1,704 hits on the archive version.<sup>13</sup>

**Open Dialogues:** In Year 2 we organised four research cafés in three schools & MK College, involving 91 students. The debating competition was postponed due to work pressures on the part of the researchers.

**Open Inquiry:** We ran the second 'Rough Science' competition in July 2014 with five teams of six Year 9 students (30 in total)<sup>14</sup> competing in a competition to launch water rockets. The teams, representing five schools, were judged by a panel (including the Mayor of Milton Keynes) on a revised set of criteria: distance flown; distance from a target; and design. The activity is outlined in more detail at: "[MK students are go for launch](#)". We also ran a pilot at Denbigh School of the Brilliant Club (BC) programme involving two OU PGRs and 16 students as part of a wider OU/BC partnership.<sup>15</sup> Six [Nuffield Research Placements](#) were hosted in environmental science: 5 students, three for 4 weeks and 1 for 5 weeks. Two maths-related activities, focused on [code breaking](#), took place at St Pauls with Years 9, 10 and 12 (90 students; see case study).

**Open Creativity:** Three media training workshops (each engaging 10 students from two local schools & MK College) were completed, producing six films, portraying aspects of [Rosetta Mission](#), the [nQuite Platform](#) and the [Invisible Witnesses](#) Project, respectively.<sup>16</sup> We have also run a graphic design project, which engaged six Denbigh students in a process of participatory design to develop an artefact representing students' involvement in SUPI activities (see case study).

**Key highlights or learning points**

One of the key highlights was the lecture by NASA astronaut, [Dr Stan Love](#). Through the work to raise the project of SUPI we were allocated 50 places for students in what was a packed lecture theatre. Another was connecting one of the MK College students, by phone, with one of their all-time heroes, the actor who plays the Sontaran Strax from *Dr. Who*.

One of the key learning points has been the programme of open dialogues. We were unable to recruit an additional member of OU staff to expand the pool of OU researchers. In part, this was because we had no funding to support this role. In practice, it has proved to be extremely challenging to promote the concept of research cafés to researchers and schools, both of whom are coming across this idea for the first time.

<sup>10</sup> The reference for the presentation is: Holliman, R., Davies, G., Sumner, J., Squires, A., Brown, H. and E. Scanlon (2014). 'Engaging opportunities: Developing a school-university partnership to connect young people and teachers with researchers.' Presented at the 13<sup>th</sup> International PCST Conference: 'Science communication for social inclusion and political engagement'; Salvador (Bahia), Brazil, 5-8 May.

<sup>11</sup> The date for the date for the 2014 lectures had to be set at a time when we had OU researchers on campus to deliver them as this clashed with a major international conference. The subsequent timing of the event ruled out several local schools as they had broken up for Christmas lowering the numbers attending. We have set already the date (Monday 7<sup>th</sup> December) for the 2015 lectures, following consultation with local schools.

<sup>12</sup> We have no data on the number of people watching from each of these connections.

<sup>13</sup> The lectures have been viewed from 32 countries, including the UK, Spain, Bulgaria, Norway, Australia, Kenya, Argentina, Cyprus and the USA.

<sup>14</sup> Nine people contributed to the organisation of this competition, including OU & DTSA staff, a PGR and an intern. A further five teachers supported students on the day.

<sup>15</sup> A [promotional film](#) was produced to promote this opportunity for OU PGRs. Many more OU PGRs have worked for the BC over the past 12 months, but in schools outside MK. We have therefore not included them in our figures.

<sup>16</sup> A further workshop was planned, but cancelled at the last minute by the school, highlighting one of the challenges of SUPI work. Five OU PGRs were recruited, producing one film about a partnership between the OU and the Field Studies Council: [Field Network System](#).

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<p><b>Issues, challenges and risks</b></p> <p>In the main the issues, challenges and risks are addressed elsewhere throughout the report. However, we note that it is extremely unlikely that we will meet the targets set in our project proposal for the number of research cafés we proposed. Having said this, we remain hopeful that we will meet our overall targets for the number of students and easily exceed the proposed number of researchers involved with the project.</p>
<p><b>Forward plans</b></p> <p>We will focus on extending our partnership working across the academic domains at the OU and across the schools that constitute the DTSA, working with staff that are more likely to push the activities, such as middle-leaders. We have made some progress in Year 2 in working with a greater diversity of academics and a wider range of schools. We are also contributing to RCUK's Cutting Edge Research in the Classroom initiative, developing a model of engagement using the <a href="#">Labcast</a> format used for OU undergraduate teaching. In this pilot, a teacher will work with a researcher from the <a href="#">Rosetta/Ptolemy</a> team to deliver a live event from the researcher's lab to the teacher's classroom, with the students in the classroom interacting. This new method of direct and virtual engagement will also provide teaching experience for the researcher, professional development for the teacher, and an authentic experience of contemporary, high profile research for the students. In addition, two proposals for external funding are in development.</p>
<p><b>Details of any significant deviation of spend profile, and how you propose to rectify this</b></p> <p>Not applicable.</p>
<p><b>Comments to RCUK and any help required from us and NCCPE</b></p> <p>Questions about funding &amp; quality have yet to be sufficiently resolved (see footnotes 5 &amp; 6). They continue to hamper our efforts to develop a strategic and sustainable approach to school-university engagement.</p>
<p><b>Update on monitoring and evaluation plans</b></p> <p><b>Publication of baseline surveys carried out with Open University researchers:</b></p> <ul style="list-style-type: none"> <li>In collaboration with the OU's Public Engagement with Research Catalyst and the Research Career Development (RCD) Team we have jointly authored a paper titled "<a href="#">Mapping public engagement with research in a UK university</a>". This paper, which has been accepted for publication in <i>PLOS ONE</i>, subject to minor revisions, reports findings from the <a href="#">CROS</a> and <a href="#">PIRLS</a> surveys (administered in Spring 2013 to researchers/research leaders), combined with interventions designed to facilitate culture change around engaged research. (The paper and open dataset are available on request.)</li> <li>We have secured agreement from the OU's RCD Team to include four institution-specific questions that explore researcher perspectives of the engaged research agenda. (These questions are in draft form. We can submit them to RCUK, and share across the SUPIs, on request.)</li> </ul> <p><b>Year 2 evaluation has consisted of carrying out the following:</b></p> <ul style="list-style-type: none"> <li>The Open Lectures have been evaluated using pre and post responses (using separate evaluation forms for students, teachers and members of the general public) and by interviewing speakers after their talks to capture lessons learnt from their experiences; data analysis is ongoing.</li> <li>Open Creativity: Evaluation of the media training workshops involved pre and post evaluation forms and interviews with the teachers and OU media professionals. Analysis of this evaluation will be used to complement the insights from our evaluation of the 2013 media training programme (see Holliman et al. 2014). We received funding from Santander Ltd, UK. &amp; the NCCPE (through their Public Engagement Ambassador Scheme) to present findings from this evaluation at the international PCST Conference in Brazil, May 2014. A copy of the abstract and slides can be provided on request.</li> <li>Open Dialogue: Evaluation of the research cafés consisted of interviews with the OU researchers involved; data analysis is ongoing. (We note that we need to recruit a larger sample of researchers to improve the rigour and increase the reliability of this analysis.)</li> <li>Open Inquiry: Evaluation of the water rocket completion consisted of asking students to complete a post evaluation form. Evaluation of the Brilliant Club partnership consisted of pre and post evaluation forms, and interviews with Denbigh School students &amp; OU researchers; data analysis is ongoing.</li> </ul>
<p><b>Comments from your key school partner(s)</b></p> <p>The partnership between Denbigh School and The Open University has been very positive. Staff at the OU have been very good in developing ideas for projects and in helping creating links between the schools and researchers. They have attempted to be responsive to individual school's needs and find appropriate researchers and activities that suit them and also to keep logistic issues to a minimum.</p>

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**Publishable case studies (including pictures).** Please provide up to two short case studies of particular achievements

**Communicating partnership: Participatory design with young people**

*Trevor Collins, Peter Devine, Richard Holliman, Mark Russell and six Denbigh School pupils (years 8 and 9).*

'SUPI' is not a very meaningful name for young people, although arguably it is less of a mouth-full than the 'School-University Partnerships Initiative'. This case study describes how a participatory design approach was applied to explore young people's and university researchers' perceptions of school-university partnerships and develop information resources for schools that communicate the values underpinning the initiative.

A series of five school sessions and one university session were completed over the course of the year. The school sessions lasted between twenty and forty minutes each and were held during lunchtime. Six pupils, one teacher and three university staff were involved. The university session lasted around thirty minutes, involved six university researchers and was completed during a morning coffee break. From these sessions the pupils produced a design for a wristband. The activities within the sessions were as follows:

1. *Is it a design classic?* The introductory session outlined the purpose of the collaboration, namely to design some way of communicating the work of the SUPI project in schools, and discussed examples of design classics and what made those designs effective (11th February).
2. *Drawing attributes I:* The pupils were given outline images of a person and were asked to draw on them to illustrate the positive attributes of an OU researcher that they would like to work with, and to write the attribute on the back of the paper. After completing thirty nine of these, the pupils were asked to illustrate the negative attributes of a researcher they would not like to work with. Thirty eight negative attributes were drawn (20th May).
3. *Drawing attributes II:* A similar drawing attributes exercise (as above) was completed with OU researchers, asking them to draw and note the positive attributes of researchers that work with schools and then negative attributes. They drew eighteen positive and sixteen negative attributes (17th June).
4. *Clustering attributes:* The images drawn by the pupils and researchers were scanned and ordered to produce a stop-frame animation, which was shown to the pupils at the start of the fourth session. The written attributes were grouped into clusters by the pupils. The clusters were reviewed and labelled, and the pupils explained their reasoning (24th June).
5. *Messages, motivations and symbolism:* Using the attribute labels and categories, the messages, motivations and symbolism of the partnership were reviewed. The meanings of colours and shapes were discussed and a preferred set selected, the pupils suggested items that could be used to communicate the project and chose a wristband as their strongly preferred option (8th July).
6. *Paper prototypes:* A set of paper prototype wristbands were drawn up, using the identified set of messages and preferred colours, and taken into the school for testing (16th December). The strips of paper were tried on and a final design chosen (below), which is now being made.



**CREATIVE**



**IMAGINATIVE**



**POSTIVE**



**INQUISITIVE**

The main challenge of working collaboratively has been with regard to scheduling the sessions, as the pupils have many constraints on their time and their multiple commitments resulted in clashing events during some of the lunchtime sessions. However, the results could not be achieved by either the pupils or the university staff working separately. Working together was the only way to gain an insight into the priorities and values held by pupils and researchers, which was a necessary foundation for communicating effectively the goals of the initiative. As the wristbands are used this year, we'll get further feedback from other pupils, teachers and researchers on the effectiveness of the outcomes from this co-design process.

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**Code-breaking challenges**

Mairi Walker and David Martí Pete, The Open University



**Mairi Walker and David Martí Pete**

Over the past couple of months we have engaged pupils from St Paul's Catholic School, Milton Keynes, in a series of interactive maths workshops.<sup>1</sup>

We are both STEM Ambassadors and postgraduate researchers based in the Department of Mathematics and Statistics at The Open University. The series of events that we organised aimed to give pupils an authentic sense of what maths research is

really about: solving problems.

Being based in Milton Keynes, we are geographically close to both St Paul's and to Bletchley Park, the latter is where Alan Turing famously cracked the Enigma code during the Second World War. This meant that code-breaking seemed like an ideal choice for our first workshop, as we could really put the topic into context. Although our research is not in the area of cryptography, we both feel that logic and problem solving are by far the most important skills used in our day to day lives as maths researchers, and are also skills that are highly sought after by employers.

In our code-breaking challenge, small teams of Year 9 pupils battled it out in a series of tasks requiring them to decrypt secret messages as quickly as possible.

During the two-hour session pupils encountered a series of increasingly difficult codes, from simple substitution cyphers, where each letter of the alphabet is simply replaced with another, through binary number coding, to the final 'mystery cypher challenge' that required pupils to analyse the frequency of letters occurring in the coded passage.

It was great to see pupils thinking outside the box, and they came up with some really innovative ways of tackling the challenges. What we liked best was how well the pupils came together as teams, nominating team leaders, dividing up the work where appropriate, and supporting and encouraging one another.

The competition was close, with all teams finishing within a few points of each other, and we had a tie for first place. All pupils worked hard though, and definitely earned the certificates they were presented with at the end of the session.

The timing of the workshop was perfect, as it was shortly after the release of *The Imitation Game*, a film looking into the life and work of Alan Turing, and just before the opening of registration for the 2015 Alan Turing Cryptography Competition. This competition, which began on 26<sup>th</sup> January 2015, is open to teams of school pupils up to Year 11. To find out more about the competition, or to register a team, visit [http://www.maths.manchester.ac.uk/cryptography\\_competition/index.php](http://www.maths.manchester.ac.uk/cryptography_competition/index.php).



**St. Paul's School Students: The Winning teams, with Mairi Walker and David Martí Pete.**

1. Our 'cryptic challenge' workshop was based loosely on one developed by the University of Leeds as part of a HEFCE funded More Maths Grads project.