Queen Mary University of London | Centre for Public Engagement

Centre for Public Engagement Large Awards
Final Report

1. Please provide an overall summary of the project. This can include information about numbers reached, evaluation information, comments from participants etc. and will be used on our website, and as case studies. (Max 300 words)

A bit more of A bit of CS4FN

We wanted to expand our CS4FN (Computer Science for Fun) project to include primary school age children (Years 5 and 6) and their teachers. 'A bit of CS4FN' is the result. It originally consisted of a website (https://abitofcs4fn.org/) that had little traffic. An earlier grant had funded a trial issue of a magazine. In this project we extended this to two further editions of an A5 magazine.

CS4FN, aimed at secondary schools, has been running for 12 years and sends 20,000 copies of an A4 magazine to 2,000 subscribing UK schools with additional website material. *A bit of CS4FN* is building up a list of subscribers and as of 31 July 2018 our mailing list now has over 330 subscribing teachers requesting nearly 11,000 copies; we have also sent over 2,000 copies to non-subscribing schools through a cold mailing, 1,000 copies to the Mayor of London to give away at their RE:CODE events and several hundred to various teacher-conferences and school events around the UK.

Website

In the whole of 2017, before this project, fewer than 2,500 people visited our site but in the first seven months of 2018 we have already exceeded that number. We have also stepped

up the number of posts on the site with 210 posts published on the site, over 120 of which were published in 2018.

Evaluation information
Teachers and children welcomed a free magazine about computing. The children enjoyed reading the articles and doing puzzles and the teachers found them (and accompanying website material) useful as both a pedagogical tool for computing classes but also just as a piece of interesting non-fiction for their class to read at their leisure. We were particularly keen that the booklets fulfilled this dual role.

Comments from participants
Comments redacted from this version of the document.

2. Please outline progress against each objective as identified in your initial application, identifying areas where activity deviated from that proposed and justifications.

Our objectives were
2.1 To enhance our face-to-face engagement with primary school teachers by having supportive material for them at events, and create a network of teachers engaged with our wider work.

Summary: We have handed out hundreds of copies of A Bit of CS4FN magazines directly to primary teachers (and parents of young children) at a variety of QMUL and external events. Waving a brightly coloured magazine, obviously aimed at children, gives us an 'in' or a 'token' with which to approach people as they pass our table.

We gave out copies of the first issue of A bit of CS4FN (originally funded by the CPE as part of a separate pilot project) at the School of Electronic Engineering and Computer Science department's Christmas lecture in December 2017, using this as an opportunity to advertise the new issues and build our network of interested teachers signing up to receive copies of the next edition. We also advertised the project through our popular Twitter account @cs4fn.

We have also benefited from links already in place through the CAS London project. Computing At School (CAS) is a grass-roots community for computing teachers with additional support from 10 university-led regional centres around the country. Staff from QMUL (inc Curzon and Brodie, also REDACTED) and from King's College London form the CAS London team, so we have used this network to advertise the magazines further. Copies of the new issues were sent on request to other regions, including Northern Ireland, to be given out at their events. The project (pilot magazine) also featured in issue 3 of *Hello World* a magazine aimed at computing educators in the UK.

NEWS FEATURE

The pilot issue of A bit of cs4fn. Image credit: A bit of cs4nf

CS4FN MAGAZINE

A new free magazine for primary schools

The CAS London team behind Computer Science for Fun has created a new free magazine for primary-aged pupils called A bit of cs4fn. The pilot issue of the magazine combines articles with games and puzzles.

"A bit of cs4fn is designed to help girls and boys to become computational thinkers for fun," says Paul Curzon, Professor of Computer Science at Queen Mary University of London.

The magazine mixes computing with topics from other subjects, supporting numeracy and literacy while drawing on history, science, music, and art. The pilot issue explains how the Romans invented pixels, so they could have mosaic floors anywhere in the empire. Another feature explains how Victorian Countess and mathematician Ada Lovelace foresaw the key ideas behind the digital age.

"We also investigate whether an invisibility cloak could ever become a reality," says Curzon; and the magazine explores what "machine learning is all about" to explain how our brains work.

Sign up for free copies of A bit of cs4fn at **abitofcs4fn.org**. (HW)

Fig 1. Screenshot of an article in *Hello World* introducing A bit of CS4FN to its readers

At the annual CAS London conference in February 2018 we gave out copies of the pilot issue to all 200 teachers (via their delegate bags) along with a sign-up sheet for the new issues. Copies were also used in a well-received workshop session run by QMUL staff for 25 teachers. We had a magazine stall laden with a range of our CS4FN magazines and other material for both primary and secondary teachers. In June 2018 at the at the National CAS conference (held in Birmingham) 300 teachers received copies in their delegates bags and Paul Curzon's 'Speed Geek' session at the conference focused on the contents of issue 2 and logic puzzles from the magazine and website.

We had a table at QMUL's *Ideas Unwrapped* stall (26 April 2018), staffed by REDACTED (who has also helped us post out additional copies of magazines when these are requested). Although that event was aimed at QMUL staff we are keen that our colleagues know they can share our free material at future events or with their children's teachers.

At the Festival of Communities in the summer we gave away 60 copies of issue 1 and 2 alongside our other CS4FN materials. We engaged with an estimated 60+ families and had some really interesting discussions with parents who commented they would welcome material for an even younger audience. More detail on the Festival of Communities is in Section 7.5.

2.2 To provide primary teachers UK-wide with useful long term classroom resources based on computer science research that inspires students about the subject but also supports literacy and numeracy.

Our magazines and website articles use themes that will not date quickly (the magazines themselves are not timestamped and will be usable for a long time). A comment from a teacher relating to the earlier first edition noted our commitment to using gender-neutral text: Comment REDACTED from this version.

We now have a range of magazines in 330+ UK primary schools (and additionally in 1,500 London schools through a cold mailing) and both the magazine and our other communications with teachers have let them know about our website too, which has 210 articles on it with 150 PDF activity sheets to download.

Electronic PDF copies of the magazines have been also made available and downloaded, though print copies are much more popular. At 31 July 2018 the A bit of CS4FN magazines had been downloaded a total of 1,495 times (detailed info on downloads per issue removed from this version of the document).

Teachers have specifically acknowledged that the magazines are very useful as a non-fiction reading resource for children to read by themselves or in class. Numeracy emerged as less of a focus for primary teachers (with respect to using the magazines / website) despite the fact that the material does include number-based activities and maths. Primary teachers, being generalists, are likely to find a multi-purpose magazine or activity sheet more useful and our material stretches beyond just literacy and numeracy and also touches on history, art and design.

Comments from teachers at the sign-up stage also told us how they intended to use the magazine in class (we assume that they will have had some idea of its content from the web before requesting one or more copies both from the web descriptions and as individual articles were online and the PDF copy is freely available and highlighted) –

COMMENTS REDACTED in this version.

2.3 To inspire primary school pupils about interdisciplinary computer science through research

It was harder than anticipated to get this information *directly* from our readers as only 20 young people responded to our survey (See Section 7.4 on primary school pupils' response), however 63% of teachers thought that the magazine had increased their pupils' interest in computing (see Section 7.3 on teachers' survey responses) and a number of teachers specifically referenced that they expected their classes to find the material inspiring (a couple of examples ~~shown below~~ REDACTED). A few teachers also acknowledged that they themselves would find teaching inspiration from the material (not shown).

3. What were the key highlights and achievements of the project?

We are delighted to have produced an entirely new high quality resource for younger audiences which can be given to them through several routes: via schools (posted to teachers for distribution), conferences (delegate bags, take-away tables, in-workshop

giveaways where the magazines are used as part of the workshop) or other events (eg shared with families at QMUL events).

Feedback from teachers indicate that they welcome having a free, physical 'multi-purpose' magazine that they can use in a variety of ways. For example, teachers can use the magazines in class as part of lessons (or derive lesson plans from them, and from additional online material), they can leave them in a reading box as non-fiction material for the children to read at leisure or they can give them out as prizes. The magazine can be folded flat and photocopied easily and does not require an internet connection. Those who can access the internet and a printer can take advantage of the extra free activities on our website.

The children also indicated that they enjoyed the magazine though they were less excited about the website as they would prefer interactive puzzles rather than things to print.

QMUL / EECS events aimed at potential future students have tended to focus on teenagers (people who might consider coming to study with us) but it's helpful to have something to offer to younger people too. The basis for decisions about future careers can be formed while still in primary school. Developing a pipeline of interest from this early age increases the chances that students will choose Computing options at school and be strong at it. We hope that our readers will develop or maintain a positive attitude towards computer science.

Paul Curzon was also delighted to win, for the wider CS4FN project, the Garriott Award for Leadership in Public Engagement, reflecting the work done by the CS4FN team in making computer science accessible to children, teenagers and teachers.

4. Please outline some key learning points: what did you do well, or wish you had done differently? If you could go back in time, what do you wish you would have known at the beginning of the project? Do you feel that your engagement method was effective?
In this project we produced two additional issues of the primary school A bit of CS4FN magazine, distributed this to schools in good time, and engaged with hundreds of teachers in schools and at conferences, and with many families with young children at QMUL events. We now have a small stock of back issues which we can continue to distribute at future events. We have also uploaded over 100 activities to our website for teachers (or children) to download and print. We also shared additional material through our website and used this, and magazine material, at events for teachers and also at the Festival of Communities. We do feel that this engagement method is effective for getting computing magazines (and website resources) to primary teachers and school children and engaging their interest in the topic.

Learning points
4.1 Already knowing (or learning about) how other teams work
We benefit from having a long and positive working relationship with the various different teams both internally (design, printing, ad hoc posting) and externally (bulk mailing)

involved in bringing our magazines to schools. This means that our processes are already fairly streamlined and each new publication doesn't require a lot of background explanation. People newer to this sort of undertaking need to pay attention to turnaround times and school closing dates (so that magazines don't arrive while the school is on holiday). This is expanded upon in Section 5.

4.2 Writing for a new, younger audience

With CS4FN we have been used to writing for a slightly older school student and it has been an interesting challenge to get the right words for 'A bit of CS4FN'. Writing appropriately was more time consuming than expected (even though there are fewer words to write). We have been very fortunate to have a primary school teacher supporting the team who has been able to help us during the drafting and proofreading process. Having primary school teacher support is critical - it is not *just* about getting the language right for children but about making sure the topics are relevant to the curriculum, or themed in a way that will make sense to teachers as well as be readable by children.

4.3 Being mindful of language and images that helps all readers feel represented

We've been careful to adopt gender-neutral references and also to ensure that computer science research by women has been well-represented. We have been mindful of varying the ethnicities of 'people' appearing in our cartoon images (see front cover of the second issue, published in Spring 2018 for example). Images that are both suitable and inexpensive (ideally free) are not always easy to come by – we have used Pixabay for free images though these are often pot-luck and so Paul Curzon has drawn many by hand to get the images that suit. This meant sourcing images was a lot more time consuming than originally expected.

4.4 Don't tie things too strongly to a particular bit of pop culture that dates it

To ensure longevity we have aimed to create resources that won't go out of date, using perennially popular themes such as superheroes and robots rather than linking to a specifically fashionable topic.

4.5 Data collection - informed consent

We've taken particular care in our sign-up information to let teachers know how we will use their data and ensure that they are positively opting-in to receive our material. This is particularly important in light of the new GDPR regulations.

4.6 Getting the most from forms - embedding and short links

Our subscribers sign-up form is hosted at Google Forms - these can easily be embedded into a free WordPress.com website or used standalone. We can share a link either directly to the Google Form or to a page on our website where they can find it, and additional information. Google Form links are naturally long and unwieldy which are fine to use in electronic media (eg Twitter, Facebook etc) where people can just click but on printed leaflets (eg at events) we use a shortened bitly link version. This is much easier for people to type in and it also lets us see how many people have visited the page via that link (126 people have visited the sign-up link from our single bitly link). It is also possible to create multiple bitly links pointing to the same site and use these across different media to find out which brings most visitors.

https://abitofcs4fn.org/free-copies-sign-up/ - this points to our landing page for the sign-up form
http://bit.ly/abitofcs4fnsignup - this points directly to the Google Form

4.7 Keep a dashboard / dump
Finally, the writing of this particular report has been made easier by maintaining a 'dashboard' or 'living document' on file with key dates and information kept in it, added soon after it happened. This is effectively a 'dump' of info that is otherwise scattered across different files, emails and even face to face comments. We recommend aggressive file management!

5. What challenges, issues and risks did you come across? How did you address these? What would you tell someone about to embark on a similar project?

5.1 We narrowly averted missing a print deadline because the designers were experiencing additional seasonal loads and staff sickness.
Although we allowed the recommended six weeks notice for one of the issues to be designed and printed we nearly hit a potentially significant delay because (i) a member of the design team was off sick, (ii) the rest of the design team were focused on producing new brochures for various open days and (iii) strike action made it much harder to co-ordinate things. We were very fortunate that they were able to support us (for which we thank them) and produce the magazine drafts in good time for us to proofread.

A small delay at one point in the process can have a catastrophic knock-on delay later on, and could mean the difference between having the magazines arrive in plenty of time to be read in the classroom or only in time to be handed out at the end of term. We needed that extra 'sufficient time' to allow them to be read in the classroom, or at leisure, and reflected on by the teachers and children so that they had the opportunity to provide responses to our survey(s). Happily we were able to get the magazines out a month before term ended and contact subscribers a fortnight later inviting them to take part in our survey. However despite this survey sign-up rates were lower than we'd have liked.

Recommendations
When distributing items to schools be aware of term dates and holidays, ensuring that there is sufficient time for your item to be received in term time. This website is helpful https://www.gov.uk/school-term-holiday-dates

We would recommend contacting the [Design] team in advance to find out what their predicted workload is like and adjusting plans as necessary. We would also recommend thinking of a back up plan too. For example if we'd not been able to time things in order to get feedback from children in schools we might have been able to arrange a special activity workshop based on the magazines and survey the children through that.

5.2 Getting ethics approval and working around that until we had it

For the third issue (last in this project) we needed to be able to include, in the going-to-print version, a link to a survey for children that was not yet finished or approved. To solve this we created a landing page on our website and customised the page's address so it read **abitofcs4fn.org/survey** and put that in the magazine. This allowed us to create the survey elsewhere, using SurveyMonkey, and once ready link to it from our generic landing page. Although the page was 'public' it was not linked from our homepage menu so less likely to be found before everything was ready, and so likely restricted to only those people reading copies of the magazine (as we would wish).

This gave us a little extra space and time to develop the draft readers' survey and submit it to the Ethics Committee (this is not needed for teacher surveys). Fortunately the approval process was straightforward and our survey was accepted (QMERC2018/37) with no changes. We were also given helpful advice on recruiting more participants (we were given permission to suggest to teachers that they invite their students to fill in the survey in class time, providing parent or guardian permission had been sought). The questions used in the survey can be found in Appendix C.

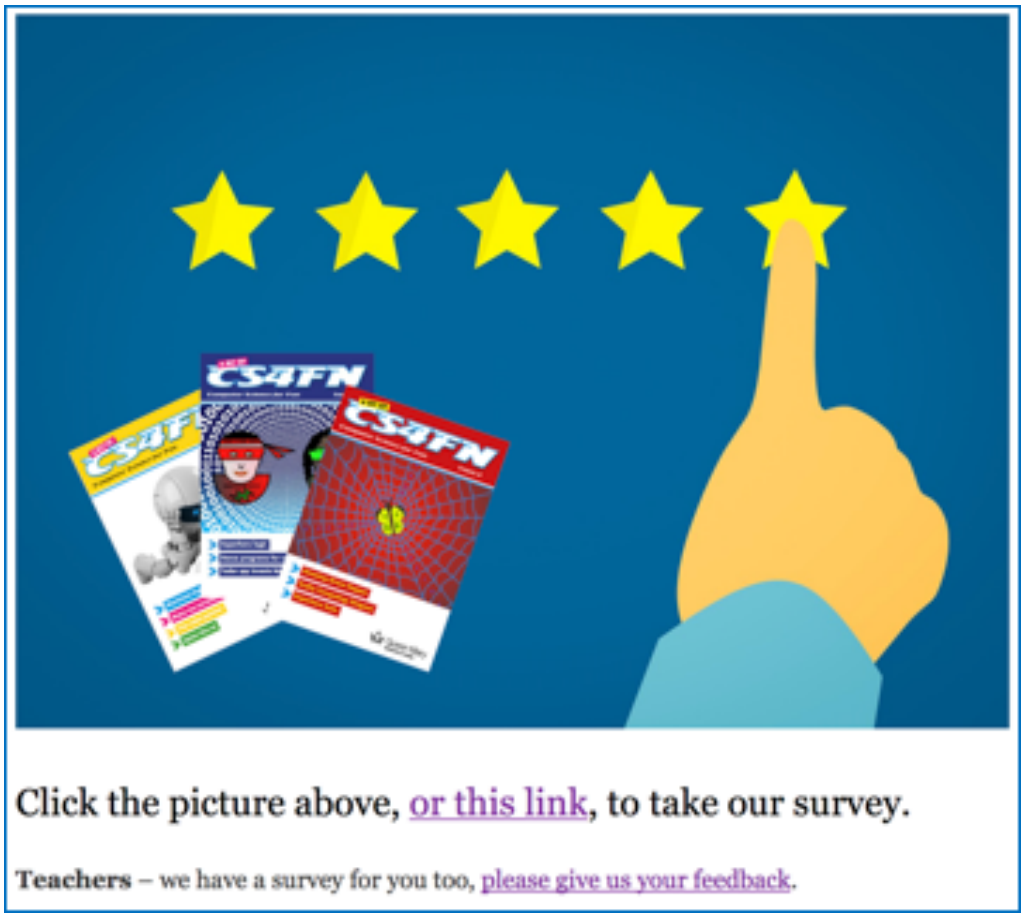

Fig 3. We used this composite image (above) on our website to encourage young people to take our survey. The basic image is the blue background, five stars and pointing hand which

was free from Pixabay and we added a spray (layout adapted in PowerPoint) of our magazines to make the image relevant.

5.3 Getting the numbers right.
Because we use the same sign-up form for teachers adding themselves to our subscription list *and* for requesting additional copies we found we'd overestimated the numbers of people and magazines required due to challenges of deduplicating. This meant a slightly lower than expected print run of Issue 2 but numbers built up again at issue 3. We were fortunate to be able to use some follow-on funding to re-print additional copies of Issue 2 to meet extra demand and we have been sending these out on an ad hoc basis. Perhaps it may be better for us to use a separate form (though this is offset by then having two forms to monitor).

5.4 Challenges of deduplication
If a teacher signs up for 90 copies and then uses the form again to sign up for another 90 copies later it may not be clear if they've realised they need 180 copies of the next issue or if they believed they were signing up for 90 copies of each magazine separately. We made as sensible a guess where we could and occasionally checked with teachers if it wasn't clear (though this can take time and email to-ing and fro-ing).

5.5 Age-appropriate language
After writing for older children getting the language level right for the younger audience turned out to take more time and discussion than expected. We are fortunate to have a former primary school teacher and parent of a young child involved in the project.

5.6 Useful background information
If creating a survey or feedback form that uses smiley, nonplussed and sad faces this can easily be done in a text editor using the letters J, K and L in Wingdings typeface.

J K L

6. Please provide details of all spend on the project as per the budget submitted. Please highlight any significant deviation of spend (even if you had previously agreed this with the CPE).

6.1 Printing magazines
Combined = **£3,500** approx

6.2 Posting magazines
Combined = **£4,500** approx

6.3 Other costs and salary contribution for administrator
£2,000 approx

7. What impact did the project have, and what is the evidence for this? Please provide information on any evaluation or reports. Did you use the evaluation toolkit? How did you find it?

We didn't use the evaluation toolkit for this as we have previously evaluated related CS4FN projects and maintained the same methods.

Overall project impact
The project has given us the opportunity to create an entirely new set of long-term computing resources for a younger audience and their teachers and to make these available free. It also gave us another opportunity to remind departmental colleagues (we emailed them to let them know about the fact that we'd been awarded the grant, and again when new magazines were published) that we have these resources available, and now for an even wider age-group, that can be given away at QMUL events or taken to other events.

Although our department's outreach focus would naturally be on older students who are nearer the age of deciding what A levels and university courses to consider this project has widened our opportunities to engage with younger students who are learning about programming and computational thinking in school. We now have an additional 'token' (a brightly coloured physical magazine) to hand to younger children and families at QMUL events.

From the increasing numbers of teachers adding themselves to our sign-up list we know the magazine is popular with them, and both formal and informal feedback confirms this. Teachers can quickly deploy ideas from the magazine (and website) in classroom teaching. A third of respondents to our teachers' survey said they had already done so.

We also enjoyed exploring a different aspect of CS4FN and gaining more experience in writing for younger audiences.

Evaluation
The evaluation comprised several strands.

7.1. Teacher sign-up list
[Details removed but we have over 330 teachers signed up requesting around 11,000 copies, several of the teachers have requested additional copies too.]

7.2. Teacher comments on signing up
When teachers sign up to receive copies of the magazine we require them to enter a brief comment to tell us how they intend to use them. It is likely that many of those signing up will have seen at least an electronic PDF copy and so have some idea of the magazines' content. Later subscribers (those signing up after the pilot project) may also have seen a

physical copy of the first issue. We have included some of these comments throughout this report [REDACTED].

7.3. Teachers' survey about the magazine and website

All teachers receiving copies of the magazine were invited to fill in our teacher survey on SurveyMonkey (Appendix A). Subscribing teachers received a follow-up email with a link to the survey a fortnight after the magazines arrive. For the copies we sent to non-subscribing schools (cold mailings to head of department) we included a letter with the same information. As of the end of July 34 teachers had responded to the survey of whom 70% were female.

Most teachers had read the magazines (or website articles) themselves and half had either learned something new or got ideas for future lessons. A third had already implemented something from the project in their classes. A third of teachers also gave the magazines away (as gifts or rewards) to particularly engaged students and around a quarter handed copies to all children in their class.

Teachers liked the A5 size of the magazine and welcomed something that could be used with a range of ages and abilities (younger or less confident readers can enjoy the bright colourful pictures and stories whereas older or more confident readers can do the puzzles and activities).

Peak use of the material was with Year 5, though teachers thought the language was most suited for Year 6. With slightly younger students one teacher commented that the language was a little hard for their class however another thought the articles were great for that same age-group where reading support was available, or for those students who wanted to stretch themselves. One teacher even used the magazine with a Year 1 class of six year olds, adapting the instructions themselves in-class for that age group.

8. What is the legacy from the project? What are the next steps?
Where can any materials, videos, reports etc. be found?

We have shown that primary schools welcome a free, age-appropriate magazine that talks about computing in a fun way and which can be used in computing lessons or additionally as a reading resource. We have 330+ subscribing teachers and their schools have copies as a potential long term resource. While they'd like the magazine to continue publication we would need additional funds to make that happen. The next steps are to explore the possibility of funding with the wider college and external funders so that this can happen. Whatever the outcome we will continue to add new resources to the website.

Children would like more interactive puzzles on the website (instead of printables). Unfortunately we can't currently offer them that in any sustainable way but there are also plenty of stories there too.

The outputs from the project are (i) physical copies of three issues of the magazine distributed to subscribing teachers, non-subscribers (cold mailings) and copies in Paul

Curzon's office for use at QMUL or external events and (ii) electronic supporting materials including a large number of activity sheets for use in school, all of which are available from our websites https://abitofcs4fn.org/ and https://cs4fndownloads.wordpress.com/

9. Please provide 1-2 images, and any other media (videos etc) that the CPE can use to showcase the project

(We submitted some but we're not including them in this redacted report)

10. Do you feel you received enough information and support from the CPE to make your project a success? Please let us know if there is anything you think we could offer to support future projects.

Yes. While we already have a lot of experience in producing and distributing magazines and evaluating this type of project it's been very helpful and enjoyable to meet with other Large Awardees regularly, and share ideas and with the Centre for Public Engagement team at QMUL. Preparing the interim report was also helpful for checking progress and gathering information for the final report.