



Les Pounder travels to Pi Towers to find out more about what the Raspberry Pi Foundation is doing to educate the educators.

Computing in schools has become a hot topic in the last few years, and teachers are keen to learn new skills to expand their knowledge of the subject. Typically this is achieved via self-learning, but when teachers need quick results they reach for training via established training providers. Continual Professional Development (CPD) is not new to the teaching world, and providers are looking to meet the needs of teachers who are eager to learn what the Raspberry Pi can do.

The Raspberry Pi Foundation has its own education team, and its champion of CPD is Carrie Anne Philbin, an ex teacher, author of *Adventures in Raspberry Pi*, and creator of a popular series of YouTube videos under the title "Geek Girl Diaries".

Linux Voice was privileged to be given behind-the-scenes access to Picademy, the free professional

development event provided by the Raspberry Pi Foundation, and the team that make it happen. We asked them all about the genesis of Picademy and the future of CPD training for UK teachers.

Genesis

When Michael Gove, the former Secretary of State for Education, announced that there were to be changes to the ICT curriculum many teachers around the UK felt that they were ill-prepared to teach the new computing curriculum and searched for specialist

CPD training to help bridge their skills gap. Around the time of this announcement the Raspberry Pi was on sale with a mission to help children learn more about

"Teachers are keen to learn new skills and to expand their knowledge of the Raspberry Pi."

Computing via creative means. What was missing was a support system of lessons and ideas for teachers to work with, and so the Raspberry Pi

Foundation created its education team with the goal of providing support material for teachers to use with their Pis. With the hiring of Carrie Anne Philbin, the Foundation education team created their own CPD under the name of “The Raspberry Pi Academy for Teachers” informally known as Picademy. The first Picademy took place at the Raspberry Pi HQ in April 2014 and 24 teachers from around the UK took their place as Raspberry Pi Certified Educators (RCE). Since April, there have been four more PiCademies, each training 24 more teachers who are spreading their knowledge to other schools around the UK.

Structure of Picademy

Typically, CPD is structured around a single day and is lead by a single trainer who is an expert in the subject. Picademy is a little different in that it is split over two days and is lead by a team of specialists from across the Raspberry Pi community.

On day one, the 24 teachers from around the UK arrived at Pi Towers in Cambridge for an early start to a full day of Pi-based training. Each of the teachers had previously gone through a rigorous selection process that involves a written application to find out about their skills and aspirations for the Pi, which is then followed up with a video application. From the hundreds of applications the chosen 24 make it to Cambridge and are put into teams that encapsulate the essence of Pi, with team names such as GPIO, Scratch, Python and Minecraft becoming precursors to the content of the next two days.

The four teams were then introduced to the Picademy team, consisting of Carrie Anne Philbin, Sam Aaron, Ben Nuttall and Dave Honess, and to the community members, which on this occasion included James Robinson, Martin O’Hanlon, James Hughes and your humble narrator. Over the course of the two days these people were on hand to guide each of the teams through their learning.

The first training session was with James Hughes, who led a quick guide to Linux and the command line, both of which are essential skills to learn when hacking the Raspberry Pi.

The second training session is with me, making my début with my favourite Pi add-on board, the Pibrella.



Using Pibrella with a little Python 3 we all made our own version of the old quiz show game “Wheel of Fortune”, which uses a wheel to randomly select a question or prize.

Session two, led by Clive Beale, introduced the class to the excellent Scratch GPIO application maintained by Simon Walters. Using Scratch GPIO, the class quickly built their own traffic lights using breadboards, LEDs and wires.

Hacking the camera module

Session three was an introduction to the Raspberry Pi camera unit and the corresponding Python module, led by Ben Nuttall. This session was a swift yet succinct introduction to the camera and how to use it with Python 3. Ben instructed the class on how to install and use the hardware using the `raspistill` command and the Python library using a hardware button to trigger the camera.

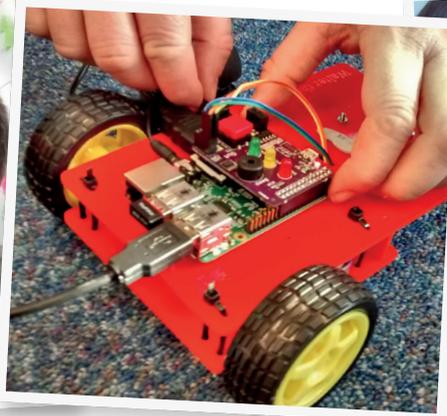
Session five was led by Martin O’Hanlon, and demonstrated how *Minecraft* can be used to teach Python in a fun and inventive manner, starting with teleporting and the x y z positioning system, and ending with the creation of diamond walkways that enable the player to walk in thin air. Martin, along with David Whale, has written a book in a similar fashion to Carrie Anne’s successful *Adventures in Raspberry Pi*, wonderfully called *Adventures in Minecraft*.

Picademy gives teachers the time and resources to try out their Pi-based projects in a supportive network.

Below left At the end of day 1 the teachers added their projects to a large wall of projects from previous Picademies.

Centre Robots are a great way to demonstrate coding concepts in an exciting manner. Why show off a boring loop with “Hello World” when you can have a robot drive around?

Below right Constantly changing the location and trainer for sessions helps the class to retain their focus along with a notebook full of notes and sketches.





Top Picademy uses Motorola lapdocks to enable teachers to be fully mobile with their Raspberry Pi projects. **Above** At the start of day 2 there were speakers from the Foundation and the Community. Here we see the Foundation's artist in residence, Rachel Rayns talking about art and the Raspberry Pi.

Sonic Pi, led by Sam Aaron, was session six, and this proved to be the most popular session of the day. Sonic Pi, the popular music composition/programming suite, is an exceptionally powerful tool in the hands of practitioners such as Sam. After demonstrating a series of ambitious projects, Sam let

the class compose their own tunes using samples and programming logic.

The last session of the day was a double feature, first led by James Robinson, who talked about integrating the

Raspberry Pi into the classroom. In the second half of the session Dave Honess demonstrated a classroom solution known as LTSP created by Andrew Mulholland that enables the Raspberry Pi to be used in a similar fashion to a thin client.

With all of the sessions complete for day one, the Picademy teachers were issued a challenge – in order to complete their Picademy training they were asked

“The teams at Picademy get all of the toys they need to build any type of project.”

to think of a project and complete it in the second day of Picademy.

Day two starts bright and early with a few presentations from key members of the Raspberry Pi team and community. Our first speaker was Rachel Rayns, an artist who works for the Raspberry Pi Foundation to further the use of the Raspberry Pi in creative and artistic projects. Rachel talked about her journey from being a traditional artist to using digital media and tools from the maker community. Our next speaker was Sam Aaron, the main developer of Sonic Pi, who works at a supersonic pace to improve the project, which is clearly visible in the changes made between version 1 and 2 of the application. Sam talks about how coding and music are interlinked with similar concepts that complement each other. Sam also demonstrated how live coding with Sonic Pi can be used for creative DJ sessions, something that will add an extra incentive for musically minded programmers. The last speaker is Matthew Manning aka Raspberry Pi IV Beginners, and his talk focused on the various communities that are present in the Raspberry Pi world.

Hands-on

With the talks over and the teams eager to get hacking on their projects, they set to work creating their Pi-powered inventions.

The Raspberry Pi Foundation provide lots of equipment and access to the engineers behind the Raspberry Pi, so each of the teams get all of the toys that they need to build any type of project. At the October Picademy the theme was quite clearly Halloween, and with projects such as a robotic mobile disco that danced to Michael Jackson's *Thriller* and a Tweeting "Ghost Catcher" this is clearly evident. During the course of the day, the teachers hacked their projects into life ready for a show and tell at the end of the day, where they met Lance Howarth, the CEO of the Raspberry Pi Foundation's charitable activities, who was on hand to issue the certification for each of the team members who are now Raspberry Pi Certified Educators.

The class graduate and network amongst themselves, forging new branches to the education network via social media and traditional networking channels. The ideas created and friendships made here will go on to help others around the UK to work with the Raspberry Pi.

How can you apply for Picademy?

Teachers from around the UK are welcome to apply for Picademy. Over the course of two days you will learn more about the Raspberry Pi and how it can be integrated into all aspects of your classes. You don't need to be an expert in the Raspberry Pi, as full guidance is provided; just arrive with an open mind ready for lots of fun and inventions. To apply for Picademy, head over to www.raspberrypi.org/Picademy where full application details can be found along with a short video introducing the Picademy training.

Interview: Carrie Anne Philbin

During Picademy Linux Voice had the chance to talk to **Carrie Anne Philbin**, the lead for CPD training in the Raspberry Pi Foundation.

LV Hi Carrie Anne, thanks for talking to us. What is Picademy all about?

Carrie Ann Philbin: The Raspberry Pi Academy for Teachers, or Picademy, is a continued professional development programme for any practising teacher around the world, from any subject specialism. The two-day course leads to certification as attendees become Raspberry Pi Certified Educators and join an online community to share knowledge and good practice. The course is completely free to attend and takes place at our headquarters in Cambridge, UK. Every cohort includes a mix of primary and secondary school teachers in equal measures, as well as experienced computing teachers and those new to the subject, to share ideas.

LV There are many different providers for CPD but not many that specialise in the Raspberry Pi. How did the idea for Picademy come about?

CAP: With the introduction of the new computing curriculum in England and with many of the Google Raspberry Pis being distributed to schools through the Hour of Code Competition in 2013, we found that Raspberry Pi was being used in more formal learning settings than it had been previously. In January 2014 I attended BETT, the largest educational technology show in the UK, with the education team and found that teachers were no longer asking "Why should I use Raspberry Pi in my classroom?" but instead asking "When will you be running training courses?" I returned to work determined to create a training programme for teachers that would be inspiring, fun, creative and worth every second. So Picademy was born.

LV Why is CPD so important for teachers and the future of our new computing education system?

CAP: The changes to the curriculum are often misrepresented by the media as a "coding" curriculum, which has led to confusion and a lack of confidence from some teachers. There is also a skills gap for many teachers. The Computing At School organisation is doing a fantastic job in dispelling these myths and providing a

platform for teachers to talk. They have also developed CAS Master Teachers in order to train other teachers and share their best classroom practice.

LV So how is Picademy different to traditional CPD?

CAP: What we are doing at Raspberry Pi is different in that we are not training teachers to teach the new curriculum, but instead to see computing as cross curricular and a subject that underpins many others like Music, Art, Science, and Design Technology.

Only 44.9% of secondary school ICT teachers have a post A-level qualification relevant to ICT and the overwhelming majority of primary school teachers do not have a computing background. A recent survey found that 60% of teachers did not feel confident delivering the new curriculum.

So far, the government has provided £3.5 million for CPD, which is equivalent to £175 per school. By comparison, Jersey is investing around £5,750 per school to make a similar step change to computing. The sum also compares poorly to recent provision for CPD for teachers in maths, physics and global issues.

LV Education is an important part of the Foundation's mission. How can Picademy be expanded to take it to more people across the United Kingdom, and possibly the world?

CAP: That's the million dollar question! We have a very small education team at the foundation and have lots of projects going on that take up a lot of our time. We are very lucky to have members of our community like Sam Aaron, Martin O'Hanlon, James Hughes, Matthew Manning and Les Pounder to give up their time to come and help us with Picademy currently.

I'm looking to create more documentation for our current RCEs (Raspberry Pi Certified Educators) so that they can train others in their area, perhaps with the support of their local Raspberry Jam, to spread knowledge.

LV Is Picademy branching out and heading on tour?

CAP: In January 2015 we are moving Picademy to Wales, and having our first ever



'on the road' event at the Sony factory in Pencoed where Raspberry Pis are manufactured. It's not out of the realms of possibility that we might visit other places in the UK and across the globe moving forward, but let's see how Wales goes first! There is something special about coming to Pi Towers for two days that I don't want to lose from Picademy.

LV What has been the response to Picademy from the Pi community?

CAP: The community has been hugely supportive. The MagPi magazine wrote an article about the CPD early on and offered us free printed issues of their magazines for swag bags. The Pi Hut, Pimoroni, Cyntech and ModMyPi have all donated swag for the teachers and the infamous prize box. Individuals like Les Pounder, Martin O'Hanlon, Sam Aaron, Alex Eames, Matthew Manning, Alan O'Donohoe, James Hughes, James Robinson and many more have helped to support the event through workshops, talks or videos.

LV If there were any changes that you could make, what would they be?

CAP: I'd like to be able to reach more teachers who lack confidence right now or who feel unsupported in their school. I'd like to show them that there is a great community out there ready, willing and able to help them. I'd also like to see our RCEs run more of their own training events in their region, and sharing resources with us to publish on our website. But it is early days for Picademy having only just completed our 5th event. There's loads more to come. **LV**