

CoderDojo Annual Survey 2018 Report

Jonathan Dickins



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Raspberry Pi Foundation Research No. 10



Raspberry Pi



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Introduction

CoderDojo is a global community of free, open, and local programming clubs for young people. Dojos are clubs where volunteers give 7- to 17-year-olds the opportunity to learn how to create with technology. Dojos are an informal, social environment where young people can create with code, learn new skills, and collaborate to create practical solutions to problems in their local areas and beyond.

This publication gives the results of our 2018 annual survey of CoderDojo champions (the volunteers who run Dojos), and gives us insight into the wide range of ways champions run their Dojos, the resources that their participants use to develop their projects, and the impact that they see in the young people who take part.

Thank you to all the champions who took the time to tell us more about their Dojos, and to all those who drive the impact on young people that we report here. We will use what we've learned from this survey to improve the way in which we support our champions and their Dojos.

Overview

Our annual survey of CoderDojo champions has given us a greater understanding of their characteristics, how they run their Dojos, how they use resources to support projects and learning, and how they view the impact of CoderDojo on the young people involved.

Key results

- Of the champions, 86% agree that the young people at their Dojo are more interested in programming and computers since they started, and 84% say that the young people they reach have improved their programming skills.
- There is no one way to run a Dojo. Dojos can range from a handful of young people to over 100, with an average of 21 attendees. There was no venue with a clear majority, but popular locations included public spaces like museums and community spaces, and schools and universities.
- Dojos provide for a wide range of age groups, but over 90% have attendees between the ages of 9 and 11. This is also reflected in the breadth of the projects that attendees work on: over 90% of Dojos use Scratch resources, but around half also use Python and HTML/CSS resources. Additionally, Raspberry Pi, micro:bit, and Arduino projects are used in around a third of Dojos.
- We estimate that around 33% of CoderDojo attendees around the world are girls, and some venues, like schools, universities, and office buildings, are more likely to have Dojos with a higher proportion of girls.
- Female champions have a different balance of backgrounds to males, who are more likely to be working in a STEM occupation. Female champions are more likely to be educators, parents of participants, or librarians.
- We found differences between Dojos with attendees over the age of 14, which tended to be larger and to use a much wider range of projects and resources to support learning, and those with only younger children. Dojos with only under-14s were smaller, more focused on simpler projects such as Scratch, and more likely to take place in a community space than in a school or university.
- Dojos in different venues use projects and resources differently to support learning. While around half of champions told us that their Dojo used a mixture of printed and online resources, Dojos in schools and universities were more likely to use only online resources. Those in public settings, like libraries and community spaces, were more likely to use printed materials.

Recommendations

- Conduct more research to understand the different age focuses of Dojos, and how we can support Dojos that are focusing on older teenagers with relevant resources and projects.
- Investigate how female champions become aware of CoderDojo, and look into why there are such big differences in background between male and female champions.

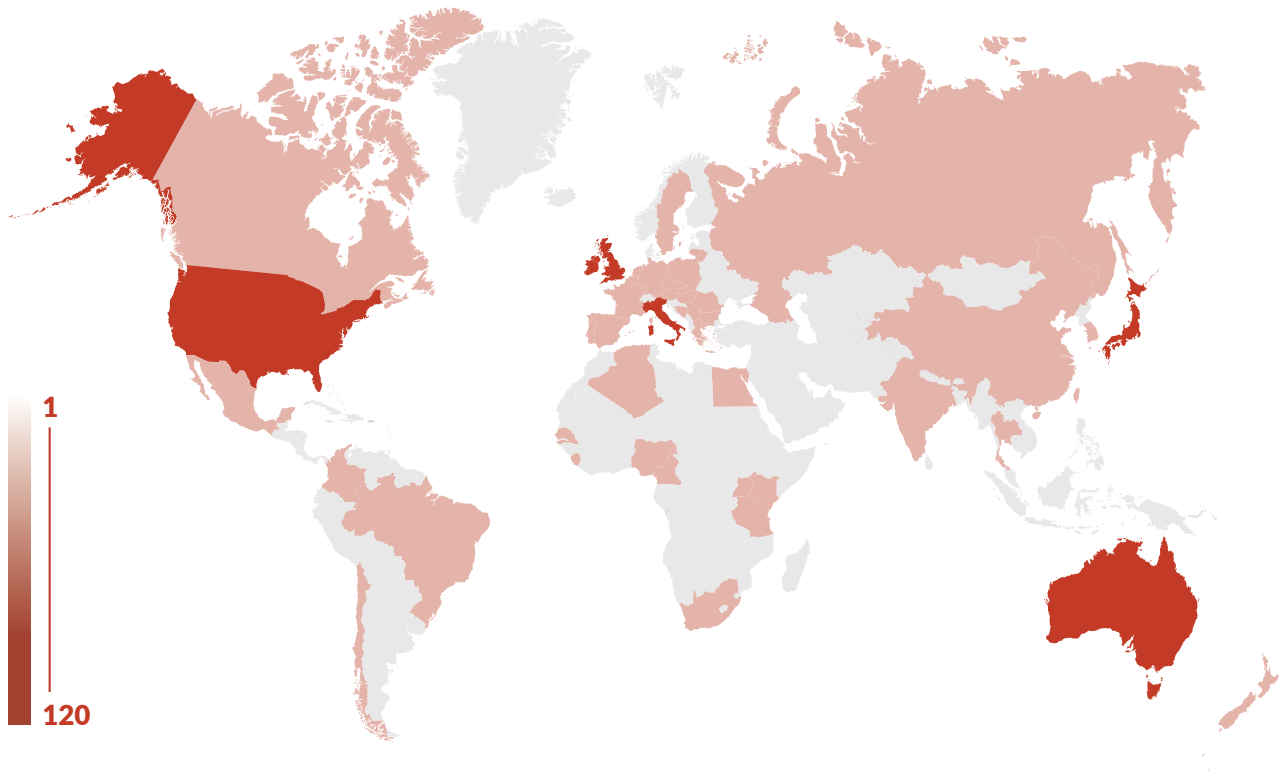
About the survey

In all, 832 volunteers (out of a total of around 1900 CoderDojo champions) completed the survey, from clubs across 53 countries — a response rate of 44%.

Headline results

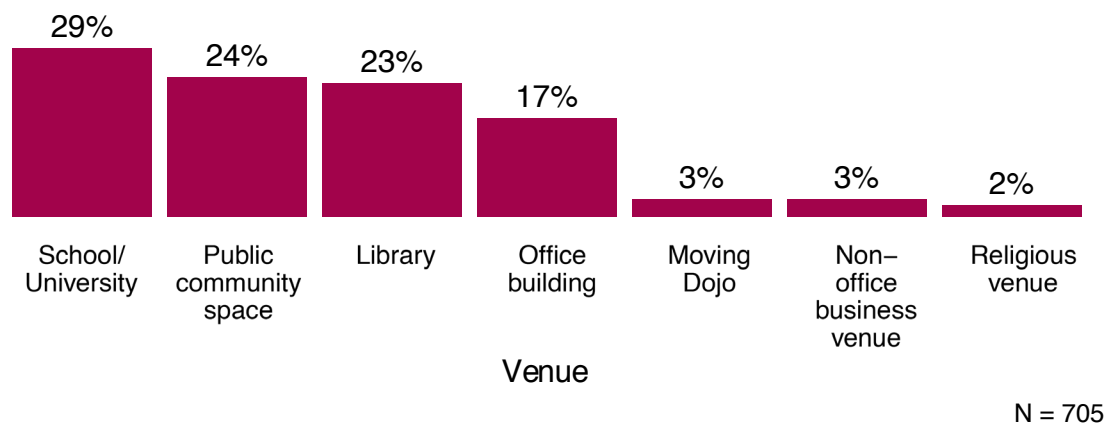
Dojo characteristics

Country of your Dojo



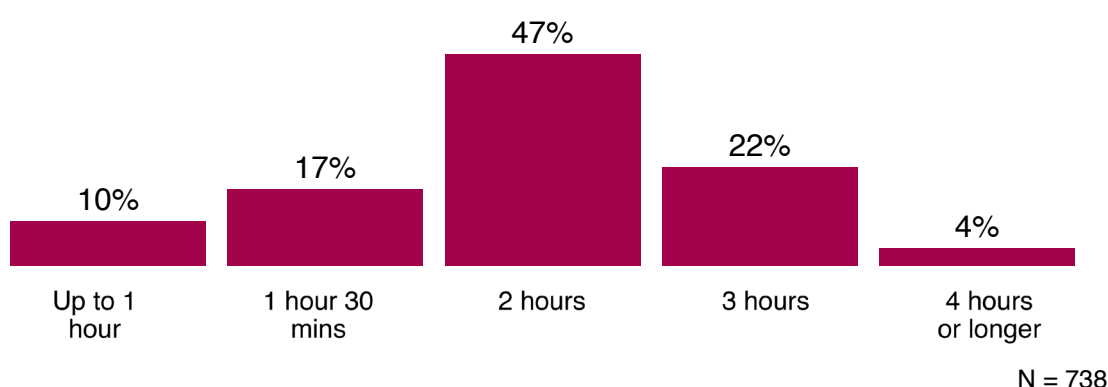
- The top countries by number of responses were:
 - Japan (120 responses, 14% of the total)
 - Ireland (102 responses, 12%)
 - UK (91 responses, 11%)
 - United States (72 responses, 9%)
 - Italy (68 responses, 8%)
- There were responses from volunteers in 53 countries in total, out of the 111 countries that had Dojos at the time of the survey.
- Proportionally, the number of responses we received from each country is similar to the distribution of Dojos across those countries. The top five countries listed above account for five of the six top countries by number of Dojos, the other being Australia (which accounted for 7% of total responses to the survey). This means that we can be confident that the results reported here are representative of Dojos around the world.

What type of venue is your Dojo held in?



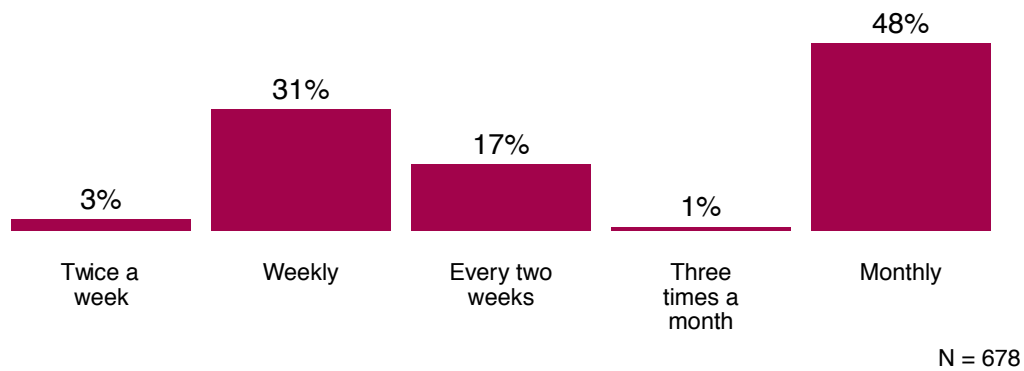
- There was a lot of diversity in where Dojos are held, with no clear majority for any one type of venue. Of those who took the survey, 29% of their Dojos were held at a school or university, 24% in a community space such as a museum or gallery, 23% in a library, and 17% in an office building.

How long does your Dojo normally meet per session?



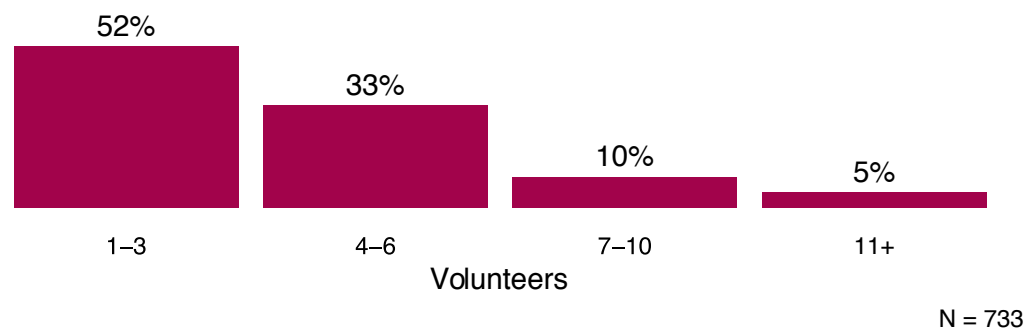
- Almost half (47%) of Dojos typically meet for two hours, with 22% holding longer sessions of three hours, and 17% holding shorter sessions of an hour and a half.

How regularly does your Dojo meet normally (excluding breaks for public holidays?)



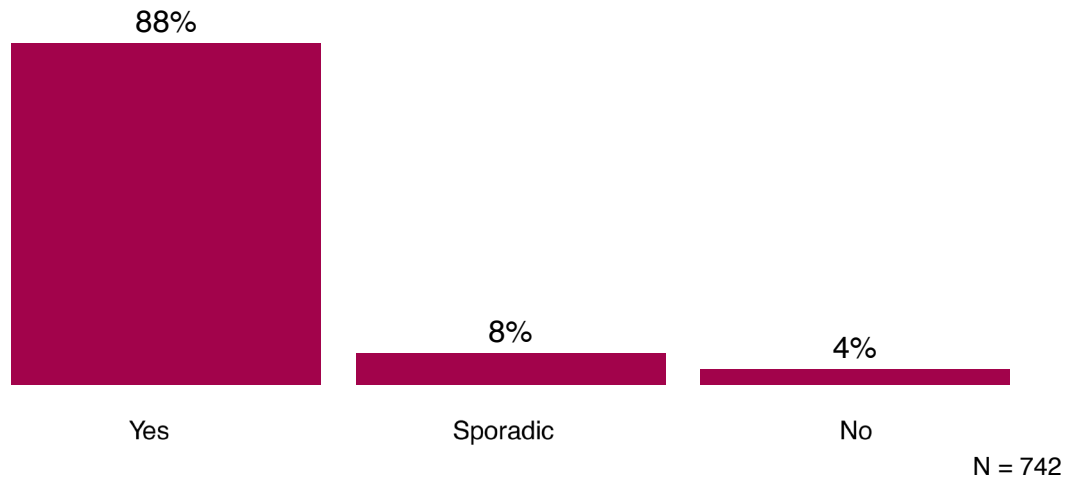
- 48% of Dojos meet once a month, with another 31% meeting weekly.

How many volunteers do you have at a typical Dojo session?



- Around half (52%) of Dojos have between one and three volunteers, and another 33% have between four and six.
- 15% of Dojos have more than six volunteers.

Do participants usually have internet access while at your Dojo?



- 88% of champions reported that internet access was available at their Dojo, with another 8% indicating that internet access was typically sporadic.

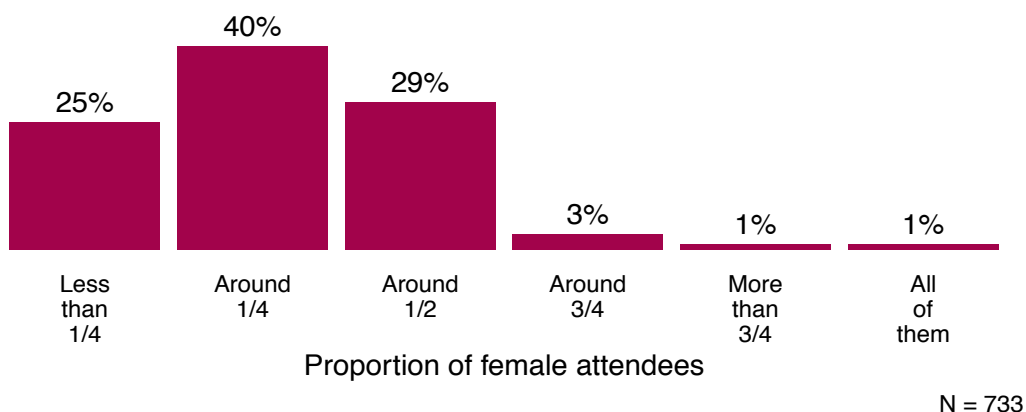
Headline results

Participants

On average, how many participants do you have attending your Dojo?

- The mean number of participants was 21, and the median was 15.
- Attendee numbers ranged from fewer than five to over 100.
- The most common responses were ten participants (84 responses) and twenty participants (78 responses).

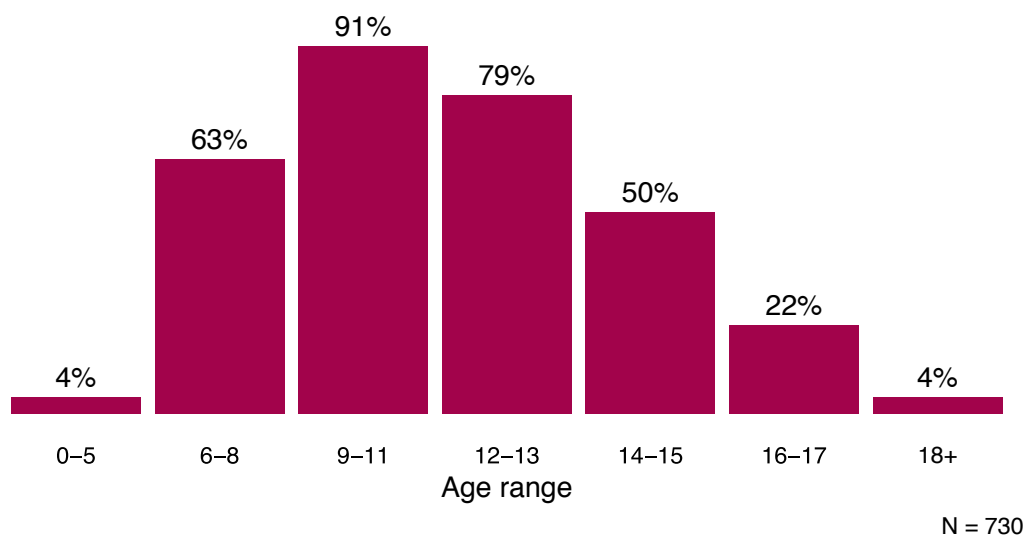
Over the last year, roughly what proportion of the young people attending your Dojo were girls?



- We gave volunteers categories to help them estimate the proportion of girls attending their Dojos, as different participants can attend different sessions and attendance at individual sessions isn't generally registered by champions.
- About 33% of CoderDojo attendees around the world are girls.

What ages are the young people who attend your Dojo?

Proportion of Dojos with participants in age ranges

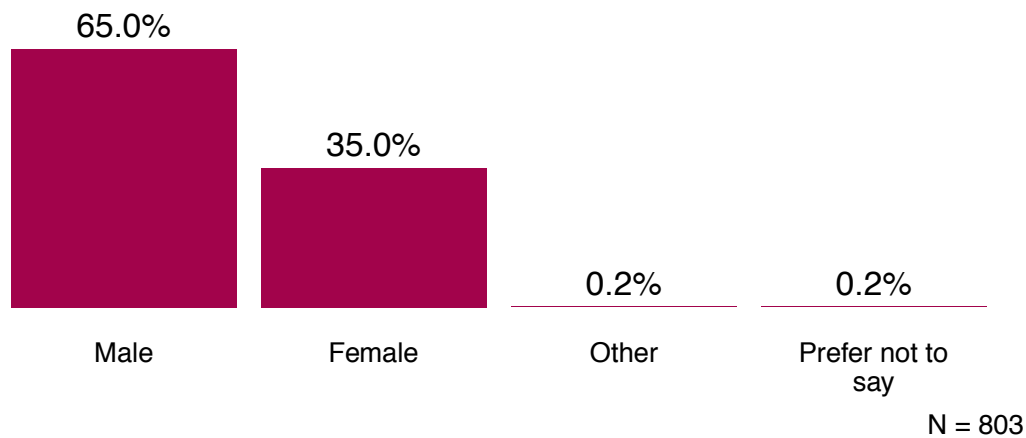


- Dojos cater to a variety of ages, and the average champion reported that their Dojo included young people from more than three of the age groups shown above.
- 91% of Dojos include young people between the ages of 9 and 11.

Headline results

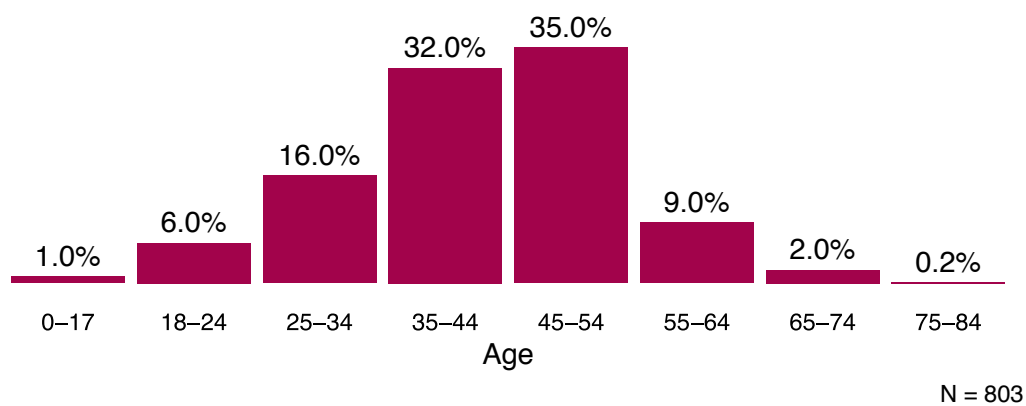
Volunteer characteristics

What is your gender?



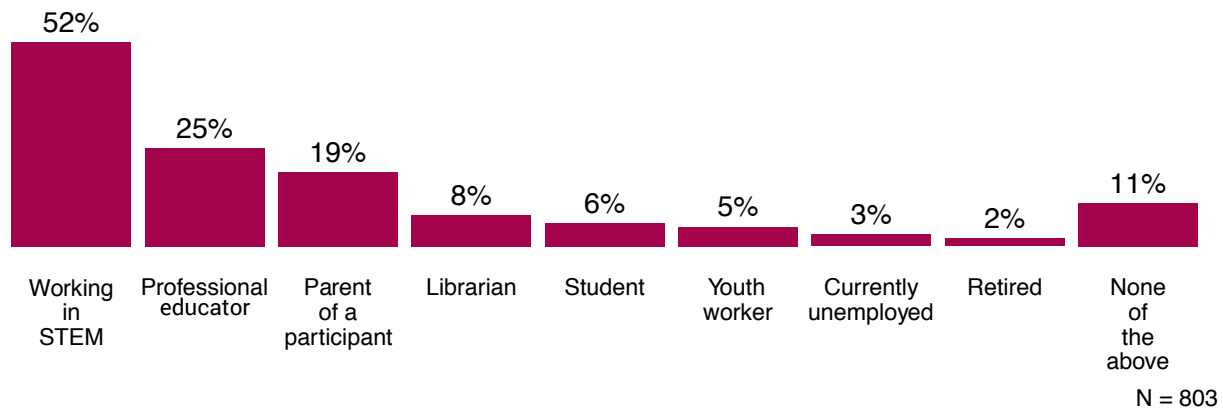
- 65% of champions are male and 35% are female.

What is your age?



- Dojos are run by champions of a wide range of ages, but the most common responses were 45–54 (35%), 35–44 (32%), and 25–34 (16%).
- 82% of champions were between the ages of 25 and 55.

Which of the following apply to you?

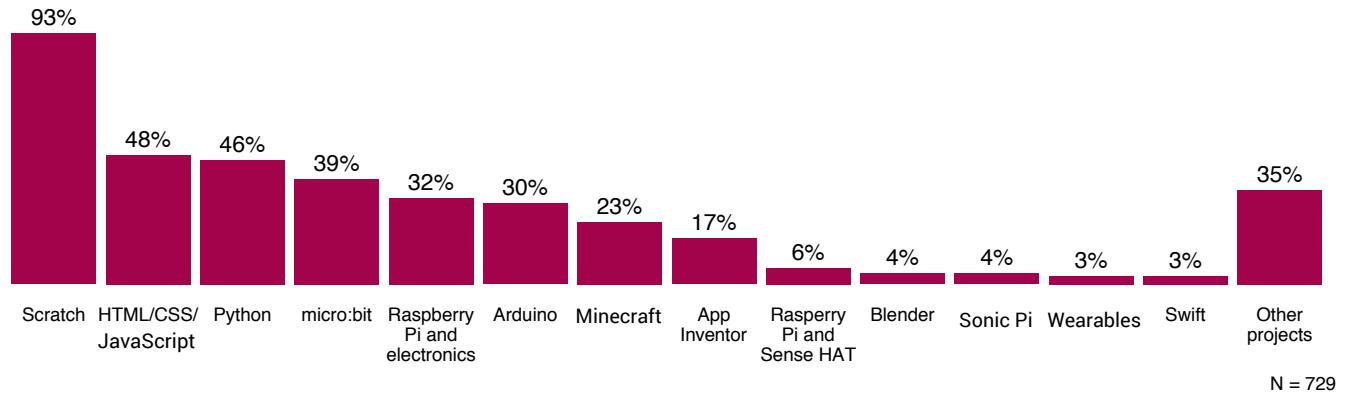


- 52% of champions work in a STEM (science, technology, engineering, and maths) occupation, and another 25% are professional educators.
- 19% indicated that they were a parent of a participant, and 13% indicated that they were either librarians or youth workers.
- The fact that 11% of champions did not believe any of these roles applied to them shows the diversity of backgrounds among those running Dojos.

Headline results

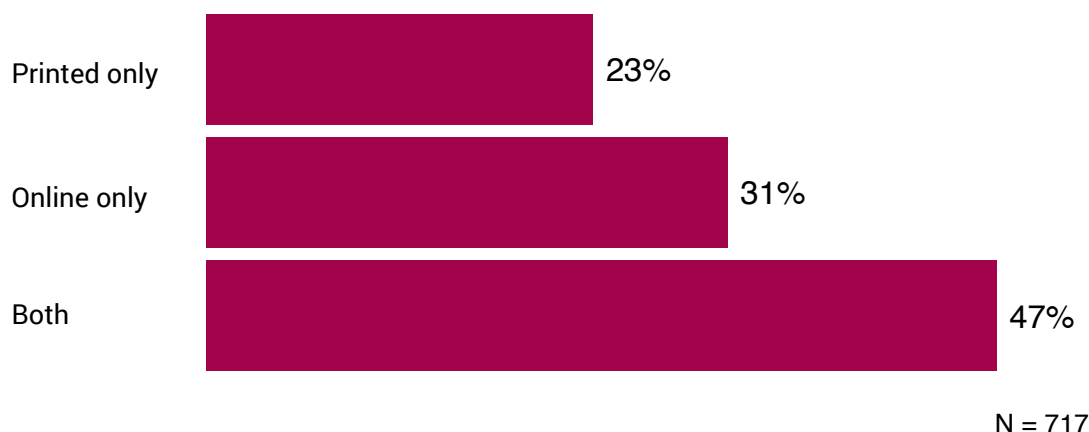
Using projects and resources

What projects or resources do you use?



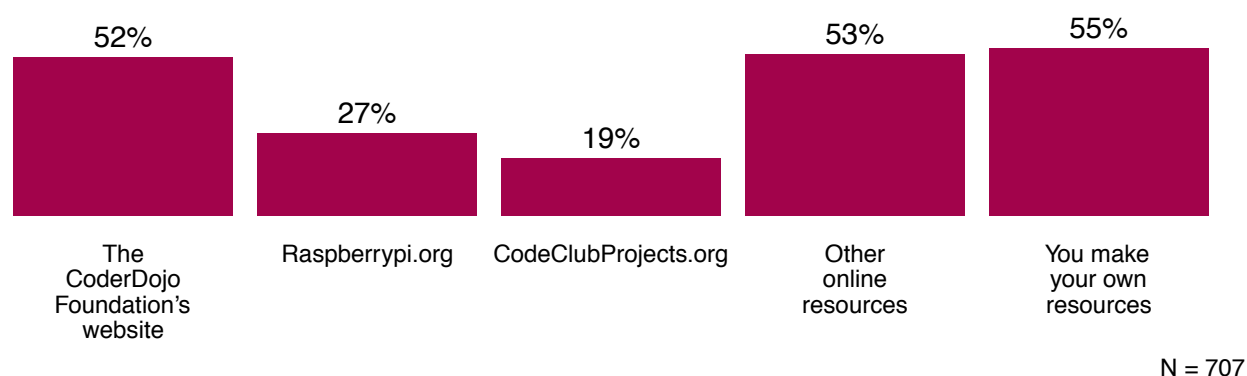
- Young people can learn and create with whichever tools and projects they choose, and keeping track of what types of projects are being worked on in Dojos helps us to support our champions with the right resources and guidance.
- Scratch is used in almost all Dojos (93%), with other popular choices being HTML/CSS/Javascript (48%) and Python (46%).
- Physical computing projects are also popular, with 32% of Dojos using Raspberry Pi and electronic components, 39% using micro:bits, and 30% using Arduinos.
- There was also a free-text option for projects not listed, and champions told us about a range of other projects their attendees were working on, including the use of robotics tools such as mBot, game development software, 3D printing, and a host of other programming languages, including C++ and Ruby.

Do you use resources and projects online or as printed worksheets?



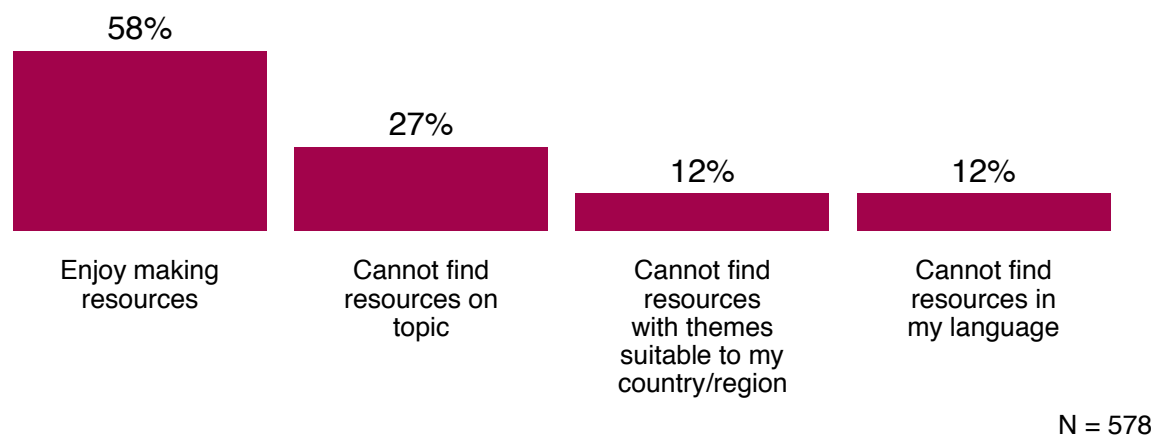
- Dojos varied in the mix of resources they use to support learning. 47% reported using a combination of online and printed resources, and 31% use only online resources.

Where do you access projects and resources?



- Around half of Dojos access resources through the CoderDojo Foundation website, with others using resources from the Raspberry Pi Foundation and Code Club.
- 55% of Dojos make their own resources to support learning, and we asked further questions to find out more about this practice.

Why do you make your own resources?



- While some Dojos told us that they couldn't find resources with suitable themes or in their language, the majority of champions who make their own resources do it simply because they enjoy it. This is a testament to the creativity of the champions running Dojos.

Headline results

Impact

What has been the impact on the young people in your Dojo?

Since starting at CoderDojo, the young people in my Dojo...

% who responded 'agree' or 'strongly agree'



N = 725

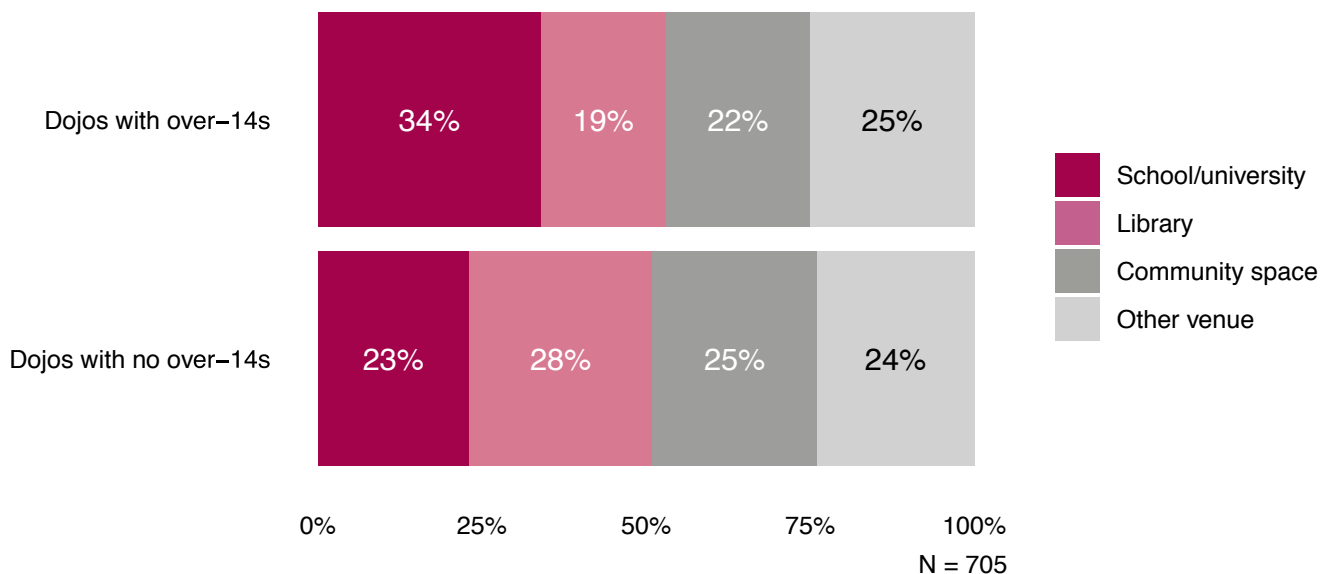
- Dojos provide an informal opportunity for young people to learn new skills, and we asked more specifically about the impact that taking part has had on the young people involved.
 - 86% of volunteers say the young people they reach are more interested in programming and computers.
 - 84% say the young people they reach have improved their programming skills.
 - 83% say the young people they reach are more confident in their computer skills
 - 73% say the young people they reach are better at solving problems with computers.
 - 68% say the young people they reach are more able to teach others computer skills.
- We were pleased to note that a high proportion of champions reported that taking part in CoderDojo has had an impact on the skills and attitudes of the young people involved.

Additional analysis

Differences in Dojos that cater to older and younger children

- Dojo participants are typically aged between 7 and 17 years old, but not all Dojos have Ninjas (attendees) across all ages. Encouraging teenagers to take part in Dojos is important to us, so we need to understand if there are any differences between Dojos that have teenagers attending and those that don't. To do this, we split our sample into Dojos with Ninjas over the age of 14, of which there were 384, and those without, of which there were 360.
- Dojos with teenagers are more likely to take place in an academic setting. 34% of Dojos with over-14s take place in a school or university, compared to 23% of those without. It may be that teenagers with a Dojo taking place in their school or university are more likely to attend simply through greater awareness of CoderDojo.

Age profile of Dojos by venue

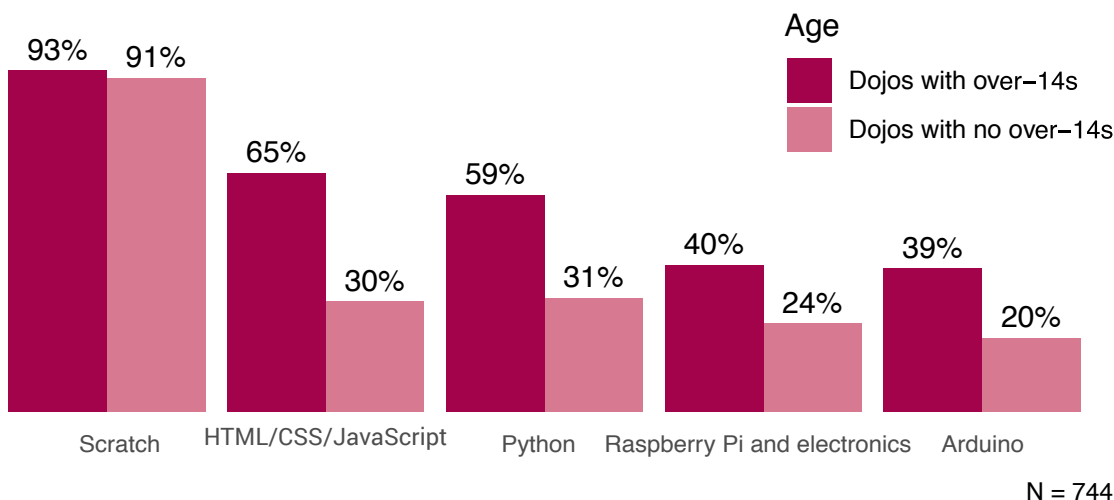


- 25 Dojos (3%) told us that they have only over-14s, so the vast majority of Dojos that have teenage attendees also have younger Ninjas.
- In terms of projects and resources used by Dojos, those that have attendees over the age of 14 typically use a wider range of projects than those that don't. For instance, 65% of Dojos with attendees

over 14 use HTML/CSS resources, compared to 30% with only under-14s.

- Older Ninjas are probably less likely to be using Scratch, and more likely to be learning with Python or HTML/CSS, so Dojos who are looking to increase their numbers of teenagers should grow expertise in these areas to support learners.
- It may be that the wider range of projects used at Dojos with over-14s is due to Dojos with this age range typically being larger and more established, with a wider range of expertise available from volunteers. We found that Dojos with over-14s had, on average, twice as many attendees per session (27) as those without over-14s (14).

% of Dojos that use specific projects or resources

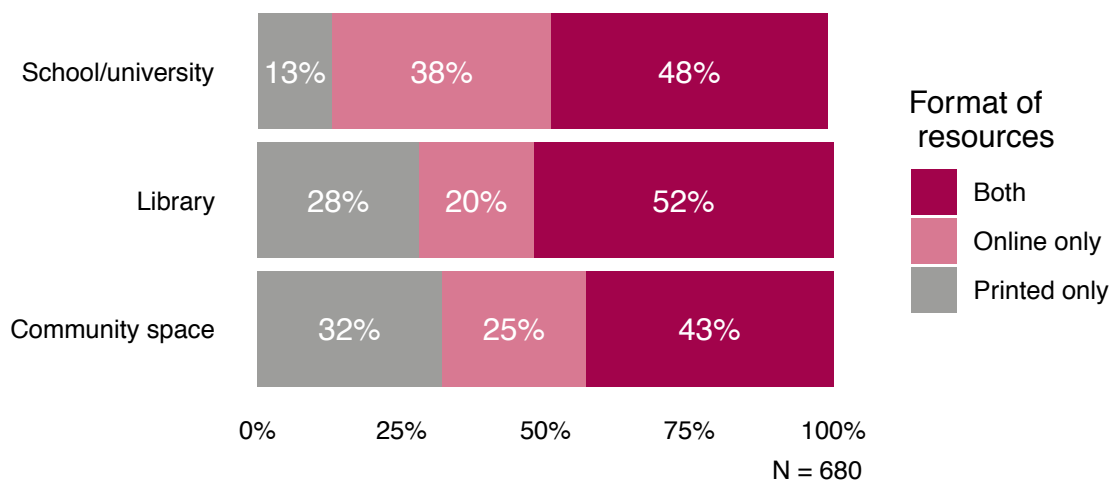


Usage of projects and resources by venue

- We provide resources and projects online and in the form of printed worksheets to help young people learn about coding and digital making at their Dojos, including Sushi Cards that help with learning popular skills, and over 200 specific projects. You can find out more at projects.raspberrypi.org/en/coderdojo.
- We saw in the previous section that around half of Dojos use a mixture of online and printed resources, but with internet connectivity being an issue for some Dojos, we wanted to explore whether there were differences in how Dojos used resources depending on the venue they are hosted in.

- 13% of Dojos hosted in a school or university used only printed resources, compared to 32% of those hosted in public community spaces and 28% of those hosted in libraries.

Usage of projects and resources by venue



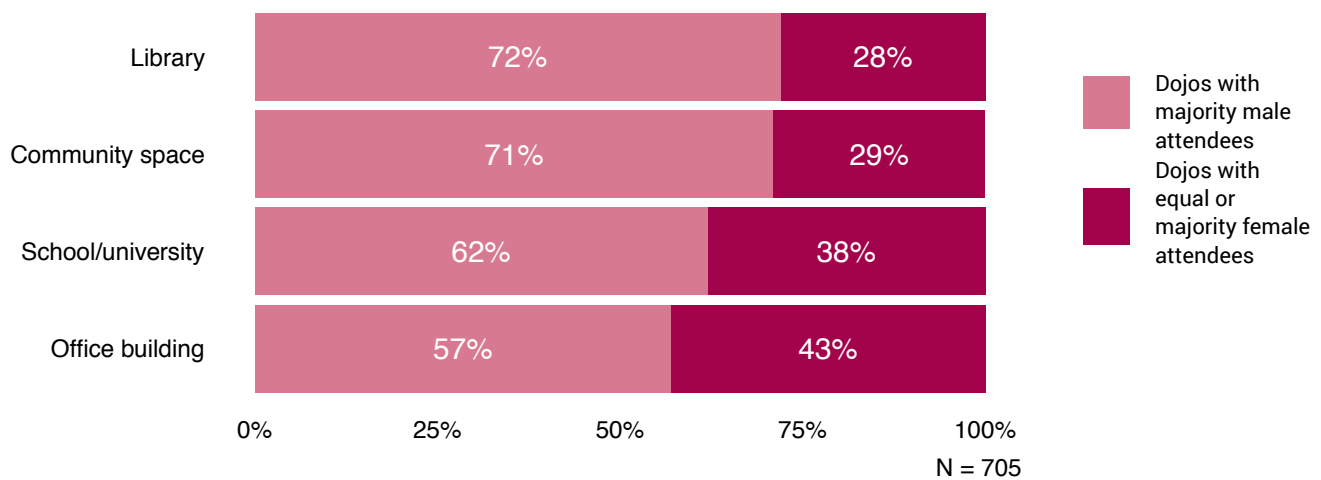
- 52% of champions running their Dojo at a library reported using a mixture of online and print resources, and 48% of those at a school or university.
- Unsurprisingly, access to a reliable internet connection affects how Dojos use resources. Dojos with sporadic or no internet access were more likely to use only printed resources.

Encouraging more girls to take part

- Dojos are intended to be inclusive environments where all young people can learn about programming and create with technology, and increasing the proportion of girls attending Dojos is a major priority. Understanding why some Dojos have a higher than average proportion of girls is therefore very important to us.
- Of our respondents, 258 (31%) told us that the proportion of girls in their Dojo was around half or more.
- Dojos with an equal or higher proportion of girls were more likely to take place in certain venues.
 - Only 28% of Dojos in libraries have equal or majority female attendees, and 29% of Dojos in community spaces.

- Dojos with an equal or higher proportion of girls were more likely to take place in an office building. 43% of Dojos in office buildings had equal or majority female attendees.

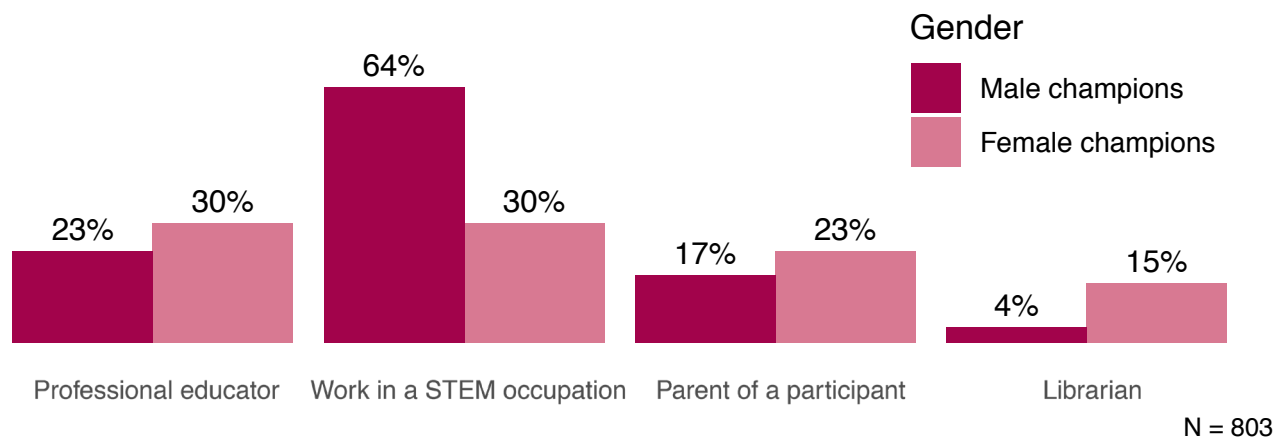
Gender profile of Dojos by venue



- Female mentors help by supporting girls, and act as vital role models in an environment that can often be male-dominated. We looked at whether Dojos with an equal or higher proportion of girls were more likely to have female champions.
 - 37% of Dojos with an equal or higher proportion of girls had a female champion. 32% of Dojos that had a higher proportion of boys had a female champion.
 - A small number of Dojos (42) indicated that they typically had a higher proportion of girls than boys. 45% of champions in this small sample were female.

We also wanted to understand if there were differences in the backgrounds of male and female champions.

How would you describe yourself?



- There were differences in how male and female volunteers described themselves. Of the male volunteers, 23% told us that they were professional educators, and 64% worked in a STEM occupation. Female volunteers, on the other hand, were equally split across these two categories, with 30% identifying as professional educators, and 30% working in a STEM occupation.
- Female volunteers were also more likely to be librarians (15%, versus 4% for male volunteers), and more likely to be a parent of a participant (23%, versus 17%).

What is the best thing about CoderDojo?

We asked volunteers to tell us, in their opinion, what was the best thing about CoderDojo. Many champions talked about the collaborative nature of Dojos, and the sharing of knowledge through showcasing and talking about their projects. Others mentioned how much young people enjoyed building creative projects and realising the potential of technology.

Volunteer comments

"It's the sharing of knowledge freely that is always inspiring: the exchange of views between those that know and those that are always asking the questions. I believe the Ninjas grow in their ability to communicate with the mentors, and vice versa."

"The delight on children's faces when they create something fun, bizarre, and utterly unique."

"Seeing the enthusiasm of the attendees, as they develop their problem-solving and express their creativity."

"The best thing about CoderDojo is the relaxed and friendly environment that encourages and supports communication, innovation, and collaboration through its members and with the community."

"I love the concept of giving young people a place to go for them to code on a regular basis and to build a community for them to explore and create. Many of them do not have this anywhere else, and I think that coding is an essential skill that all young people should learn."

"A child living in a village with no tarred roads feels that he belongs to a world community when he receives tools to pursue his dreams."

Conclusion

This survey has updated our understanding of how Dojos are run, who our volunteers are, and how they support young people in learning to code. It has also given champions a chance to feed their opinions back to us and to tell us more about the impact they see on the young people they support. We will use what we've learned to help us support our community of volunteers better.

For the first time, we asked champions to assess the impact that taking part in CoderDojo has had on the young people involved. A high proportion of champions agreed that CoderDojo has been beneficial to the programming skills, problem-solving, and confidence in computer skills of the young people involved, as well as boosting their interest in programming and in computers generally.

Our champions come from a range of backgrounds, with only around a third being professional educators. Many others are STEM professionals who use their knowledge and skills to help young people create projects and learn, and we also have librarians, youth workers, and parents of participants among our champions. They range in age from under 17 to over 75, and make use of learning settings such as schools and universities, as well as community venues, libraries, and office spaces, to run their Dojos.

There is no one way to run a Dojo. They can range from having a handful of attendees to over 100, and the frequency at which they are held varies: some are held as frequently as weekly, and they are held over all seven days of the week. Dojos also differ in the types of projects their attendees are working on. We've been delighted to see the range of skills and approaches young people are working on across Dojos.

We've also looked more closely at how Dojos are engaging young people over the age of 14, finding that those with teenagers are more likely to take place in an academic setting, more likely to be larger clubs, and more likely to have attendees working on a wider range of projects. We will use what we've learned to help us support Dojos cater to teenagers.

Dojos are open to all, and increasing the proportion of girls taking part in CoderDojo is a major priority for us. We've investigated how Dojos with a higher proportion of girls compare to those with a higher proportion of boys, finding that Dojos with more female

attendees are more likely to take place in certain venues, such as office buildings. Understanding the profiles of our female champions is vital, as evidence suggests that the presence of female role models is important for improving diversity. We found that our female champions are more likely to be professional educators, parents of participants, and librarians, whereas most male champions are professionals working in STEM.

Finally, this work has helped us to identify some recommendations. We want to know more about how female champions become aware of our work, and about their experiences in setting up and running their Dojos. We will also continue to develop learning resources across a range of topics to support Dojos with teenage attendees who want to develop new skills.

Thank you to all the champions who took the time to complete the survey, and for the time they give in bringing the power of computing and digital making to children around the world.

