CoderDojo and Libraries:
Why Your Library Should Get Involved and How to Start Your Own

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Abstract

CoderDojo is a movement of free computer coding clubs which began in Cork and is now a worldwide phenomenon. Examining what CoderDojo is and how it works in a public library setting, as well as the extant literature, this article gives reasons why your library should start a Dojo and a ten-step guide on how to do so.

Keywords: *CoderDojo, coding, programming, IT, libraries, peer learning, children, teenagers*

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Introduction

In June 2016 I presented at the Youth Library Group's Success Stories Day about Ballyroan Library's CoderDojo, which fell under our larger Creative Campus project.[2] The brief presentation was met by huge interest in the topic and a lively Q+A session. Most participants wanted to know the practicalities: what exactly it is, how it would work, how to set one up, how to get mentors on board, and how much it would cost (it's totally free!) It was these questions, along with the realisation that there was very little literature regarding CoderDojo and libraries, that prompted me to write this article.

What is CoderDojo?

Coding, the act of writing statements – or lines of code – to instruct a computer to accomplish specific actions, is what all modern computing is based on. Every computer program you use has been constructed by formulating many lines of code (often running into millions) using a variety of computer programming languages such as C++, Python or Java. CoderDojo is a coding club for children aged 7-17 where children "learn how to code, develop websites, apps, programs, games and explore technology in an informal and creative environment"[3]. CoderDojo (https://coderdojo.com) began in 2011 when Cork student, James Whelton (then 18) set up a computer club in his school, taught other students programming languages used to create webpages, HTML and CSS before later joining forces with entrepreneur Bill Liao[4]. Together they started the CoderDojo movement which has grown into a worldwide phenomenon with hundreds of Dojos world-wide. Each Dojo's remit is different; they commonly cover the basics such as Scratch, HTML, and CSS, but can also include other topics such as more advanced programming languages, game development and even hardware and robotics[5].

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2   https://coderdojo.com/about/
3   https://coderdojo.com/about/
    Winner of the 2015 Chambers Ireland Best Library Service Award
4   https://coderdojo.com/about/coderdojo-movement/
5   https://coderdojo.com/about/coderdojo-movement/

A Dojo Case Study: CoderDojo Rathfarnham at Ballyroan Library

Each Dojo is free, led by volunteers (or in Dojo-speak, mentors) and organised by the Dojo's champion. I am the champion for our Dojo, CoderDojo Rathfarnham, which began in 2013. It runs every Wednesday from 6-8pm in two terms, from September to December and from January to May. As of May 2016, we have had 81 weekly Dojos. Each Dojo has 20 places – 12 PC places (where the attendees use our library PCs) and 8 laptop places (where they use their own laptops) and is hosted in our Digital Training room. So far, we have provided 162 free hours of coding per student/place to a potential 3240 students.

Initially there was an unprecedented demand for places, so it was decided to make the booking process first-come, first-served, and on a weekly basis (instead of per course or per term). This facilitates both children and parents; if the child cannot make it one week, they need not book; or if they come to a few classes, and find it is not for them, they can stop coming without leaving an empty space mid-course. Such adaptability corresponds with the fact that

our Dojo has a completely child-led curriculum. It is not a class, but a coding club; the mentors show beginners the basics using handouts, guide intermediate level coders using more advanced handouts, instructing them using various online resources such as CoderDojo's own wiki, Kata[6], or external sites like CodeAcademy[7], and even assist advanced coders who are working on larger projects or programs. We are able to provide learning to all levels within the one structure.

The success of the Dojo is entirely dependent on having a pool of committed mentors. They can be adults working in IT, or older teenagers (16 and up) who are code proficient; we have had both in Coder Dojo Rathfarnham. Luckily, we have talented and enthusiastic mentors who volunteer their time, weekly. Regarding using younger mentors, we find that the children respond well to mentors closer in age to themselves, and also that younger mentors rise to the responsibility. Crucially, we have had attendees transition into being mentors themselves, which is an example of Coder Dojo's open learning community ethos.

Why You Should Set Up a CoderDojo in Your Library

Whizz-kid Jordan Casey (14 years), proclaims that "coding is the future" (Holmquist, 2014) but it is also now a fact of everyday life. We are increasingly surrounded by smartphones, tablets and PCs and children nowadays have grown up with these technologies, becoming what Palfrey & Gasser (2008) call "digital natives". However, whilst most can use these technologies intuitively, what is becoming more important is that they understand how they work, and that they are not only able to consume, but also to create. As such it is "increasingly a coder's world" (Wisniewski, 2012, p. 57) where "the single skill that will, above all others, distinguish a literate person is programming literacy, the ability to make digital technology do whatever, within the possible one wants to do" (Prensky, 2008, cited in Sheridan, Goggin & O'Sullivan, 2016) and CoderDojo provides a path through this landscape.

Unlike the tutor-led computer classes in libraries, CoderDojo is entirely free; the mentors give their time gratis and all it takes is some organisation by staff including the printing of some handouts.

Hosting a Dojo not only fosters a sense of community but also encourages youth mentoring and self-led learning[8] .However "the real success of the clubs is the philosophy of peer learning – students learning from each other in a sociable and creative environment" (Holden, 2014). Such an environment is also excellent at enticing teenagers into your library, something which can be difficult, if not impossible at times, since they can completely vanish from public libraries until later in life (Brown, 2004, quoted in Snowball, 2008, p. 25). We have found that our Dojo attracts not just boys, but girls also, in a relatively even gender split, which is very encouraging. This is perhaps due to the sterling work of other Dojos, where they have some problems attracting female participants. DCU set up a local initiative, CoderDojoGirls to encourage young girls to participate[9]. Either way, it is important to note is that CoderDojo appeals to boys and girls of all ages.

Another reason to consider hosting a Dojo is that the demand is there. A 2014 article warned that there is a need for ten times the amount of Dojos currently operating in Ireland, with such demand resulting in long waiting lists (Holden, 2014). As of June 2016, there are now "more than 1,000 dojos operating across 63 countries, reaching about 35,000 young people on a weekly basis" (O'Connell, 2016) with the amount of new Dojos continually increasing.

The best reason to set one up in your own library is that few libraries do it, and we are a perfect fit for this type of regular event. Currently, Ballyroan Library is the only library in Dublin that hosts a Dojo and CoderDojo. Their website and organisational literature suggest libraries first and foremost as a venue to host a Dojo. As Wisniewski said in 2012, the "requirements for setting up a Dojo are straightforward and align very well with libraries' missions and

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6   http://kata.coderdojo.com/wiki/Home_Page
7   https://www.codecademy.com/

8   https://coderdojo.com/about/
9   https://coderdojo.com/news/2015/03/11/girls-who-code-coderdojo-girls/

capabilities: You need meeting space, internet access, some volunteers (or library staff) who have something to teach, and computers. Check, check and check!" (p. 60), a statement which still holds true now. Staff involvement in CoderDojo could have practical benefits for Continued Professional Development. As libraries embrace more technology , our roles become more technical, and involvement in a Dojo is a chance for staff to develop their own coding skills.

10 Steps to Start a CoderDojo in Your Library.

- **Step 1:** It Is What You Make It
  Before beginning, the important thing to remember is that "there is no typical Dojo and the activities run vary from club to club"[10]. Whilst this may seem initially daunting, it will ultimately be to your advantage. Consult with your recruited mentors to see where their strengths lie. They may be proficient in HTML, Python, or Scratch and perhaps that is what your Dojo may focus on. Some Dojos do specific sessions on different languages, whereas others, like ours have a more open framework. There is no right or wrong and its structure is entirely up to you.

Indispensable, and available on CoderDojo's website, are a series of start-up guides, such as "Your Guide on How to Start a Dojo"[11] which clearly lays out all of the basics you need to consider, as well as smaller guides such as "How Do I Start a Dojo"[12] and "Become a Mentor"[13] as well as CoderDojo's own Recommended Practice policy[14]

- **Step 2:** We are the Champion(s)
  A Dojo champion is someone who is in charge of set-up and the running of the Dojo. I am Coder Dojo Rathfarnham's champion and, as CoderDojo themselves state, you do not have to be a techy type to be a champion (see "How Do I Start a Dojo"[15]). In fact, I do not understand most of what is taught and learned in the Dojo! The main functions of the champion are administrative and organisational, something that library staff can easily undertake, and consist mainly of interviewing, liaising and managing the mentors; setting up booking for the Dojo; responding to queries; and promoting the Dojo.

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10 https://coderdojo.com/about/coderdojo-movement/

11 https://coderdojo.com/wp-content/uploads/2015/06/CoderDojo-Start-a-Dojo-Guide.pdf
12 http://kata.coderdojo.com/images/d/d6/CD_Start_Dojo.pdf
13 http://kata.coderdojo.com/images/2/23/CD_Become_Mentor.pdf
14 https://coderdojo.com/wp-content/uploads/2015/04/CodeofRecommendedPractice.pdf
15 http://kata.coderdojo.com/images/d/d6/CD_Start_Dojo.pdf

- **Step 3:** Register Your Dojo

  You need to inform people that the Dojo is happening and the best way to get started is to register your Dojo with Zen, CoderDojo's community platform. On Zen, there is a searchable list of all active Dojos. Once you register and are subsequently approved, you will receive your own Dojo page where you can put up general information, booking information and anything else you require. It is essentially the Dojo's website, as well as attendees' first port of call., This is an essential step in the process. Our Dojo page is here[16].

  We suggest setting up a dedicated email address with a free email hosting service, such as Gmail, to deal with queries/liaise with mentors, as well as social media accounts. Our Dojo has a dedicated Twitter account (@CoDoRathfarnham), as do most Dojos, and we also promote the Dojo through our Ballyroan Library Facebook Page.

- **Step 4:** Mentors

  Gathering a pool of mentors is crucial. CoderDojo have highlighted places where you might find them such as "in local technology companies, businesses, or community centres [and] in local universities, college or second level schools"[17].

  Once registered on Zen, you can highlight on your page that you are looking for mentors, and as a direct result of doing so, I have had many people contact me looking to volunteer. To build a pool of active mentors, I constantly advertise that we are seeking new volunteers, since mentoring at a Dojo can be a big time commitment, and at times people may need to drop out. CoderDojo recommends a ratio of one mentor to eight young people and while that is largely true, I would suggest for the first while at least, a smaller ratio of one mentor to five young people.

- **Step 5:** Where, When and How Often

  In Ballyroan Library, we have a Digital Training room which holds 12 PCs It

also has room for three long tables where we host eight laptop spaces. In addition, provide space and chairs for the parents who attend the Dojo with the children. You could host a Dojo in your public access computer spaces within the library, or if you do not have a dedicated space, perhaps you could host a laptop-only Dojo in your meeting space?

Many Dojos, particularly in Dublin, are held on Saturday mornings. However, due to staff availability, we decided to hold ours on Wednesday evenings. You could assess what other local events may clash with the Dojo but ultimately, you should host the Dojo when it suits your library.

Our Dojo is held weekly during terms and while the demand is always high, due to time and staffing constraints, we are unable to provide more than one Dojo per week. If hosting a Dojo weekly is too much of a commitment, you could opt for fortnightly or monthly sessions. You could perhaps run an initial series of sessions to gauge local interest.

- **Step 6:** Staff Buy-In

  Unlike regular and easily explained library events like a Movie or Book Club, a lot of patrons may be unsure of what a CoderDojo will be in practice, and this will need to be explained clearly to all staff so that it can be disseminated to patrons, as well as procedures for booking (which is entirely online, and discussed in Step 8 below).

- **Step 7:** Course Content

  Our Dojo is child-led and caters to each child's own level of ability. We have a small selection of handouts that we have collated over the years that we use to give the children small projects to work on.

  We have found that Scratch[18], a programming language, designed by MIT Media Lab's Lifelong Kindergarten, is great for beginners as it permits them "to create and experiment with code that doesn't have to be syntactically precise, [allowing them] to get a feel for working with conditions, parameters, and actions without getting tripped up by a misplaced comma or unclosed bracket" (Wisniewski, 2012, p. 59). They

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16 CoderDojo Rathfarnham on Zen: https://zen.coderdojo.com/dojo/ie/dublin/ballyroan-library-orchardstown-avenue-rathfarnham-dublin-14/rathfarnham

17 http://kata.coderdojo.com/images/d/d6/CD_Start_Dojo.pdf

18 https://scratch.mit.edu/

have a great handout called "Getting Started with Scratch" which is the first one we give to an absolute beginner and is available here[19].

There are plenty of free handouts available online. Good places to check are:
– Kata[20], CoderDojo's wiki, has a vast array of downloadable handouts available
– Other Dojos often put up handouts they use for free online. Follow them online (Twitter seems to be the most commonly used social media for Dojos)
– Sites like CodeAcademy, or Code.org

When in doubt, consult with your mentors who should be able to point you in the right direction, or perhaps even write their own.

- **Step 8:** Registration and Ticket Booking
  In 2015, CoderDojo revamped their website and completely changed their booking process. Before this, they suggested that a Dojo set up a free EventBrite account[21], through which you can create an event and tickets (as long as the event is free, there is no charge) which was embedded into your Dojo page. This is the model that we still follow here, as our patrons are used to it. However, Eventbrite embedding is gone, so we now just post a text link on our page. This is perfectly adequate since, as CoderDojo state themselves, "Dojos are autonomous entities [and] all operate different registration systems and policies"[22].

  For each Dojo, on our EventBrite event page, we offer three types of ticket:
  – Child's PC Ticket (for those who wish to use our PCs);
  – Child's Laptop Ticket (for those who wish to bring their own laptop);
  – Parent's Ticket (in our Dojo, all children aged 12 or under must be accompanied by an adult – for more information, see step 10).

  However, we would suggest, that new Dojos starting up avail of the current booking system, where one must first create one of four types of account (Champion, Ninja[23] under 13, Ninja over 13, Parent/Guardian) and once they register to a specific Dojo, the champion can create an event, notify all their members, who can then book in – all through Zen.

- **Step 9:** Marketing
  Although a lot of marketing will be done through simply having your Dojo listed through Zen and promoting it through social media, it is important to advertise the Dojo any way you can. We always advertise our Dojo in our monthly event brochures (both digital and print), our digital signage, posters, and through personal interactions. Other ideas could be to promote the service direct to schools and youth groups, or to liaise with your local newspaper.

- **Step 10:** Child Protection
  Child Protection is an issue that must be borne in mind when running a Dojo. In CoderDojo Rathfarnham, all children aged 12 and under must be accompanied by an adult at all times. CoderDojo has their own Child Protection Policy, as well as support documents, and details on how to Garda vet all involved, as well as Child Protection training courses that they run[24].

Conclusion

The literature on CoderDojo, its implementation and use in libraries is scant. Besides Wisniewski's short 2012 article, Sheridan, Goggin & O'Sullivan (2016) are one of the few to address CoderDojo and libraries in their fascinating conference paper that explores "the potential to link the digital competence which might be attained by participants with formal educational pathways thus potentially encouraging wider participation in third level education", which could prove an effective route for demonstrating the value of CoderDojo to libraries in the future.

Hopefully this article will go some way to redress the lack of literature on the topic and perhaps even convince you to start your own library Dojo. If you have any further questions, please feel free to contact me, and if you would like to hear

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19 http://d.umn.edu/~sivelab/project/learningToCode/Getting-Started-Guide-Scratch2.pdf
20 http://kata.coderdojo.com/wiki/Home_Page
21 Ours is here: http://www.eventbrite.ie/o/coderdojo-rathfarnham-4896173973
22 https://coderdojo.com/attend/

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23 "Ninja" is Dojo-speak for a child.
24 http://kata.coderdojo.com/wiki/Child_Protection_Ireland

more and see our Dojo in action, CoderDojo Rathfarnham was featured in the Public Libraries 2020 project in a short video which is on YouTube[25].

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Acknowledgements

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25 "Coding is Child's Play" https://www.youtube.com/watch?v=X1bUuJLCbaI