

Coded to Succeed

A Beginner's Primer to Robots, Kids, and Libraries

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Perhaps you've heard the stories, read the news reports, or seen it for yourself. Perhaps you let yourself lapse into daydreams—what if *my* library had robots?—but then quickly returned to reality. Perhaps the time has come to change that. This article's goal is to get youth and teen librarians excited about robots and their interactions with young patrons, provide them with resources for further investigation, ideas from other libraries, and tell what's going on in the world of kids and bots.

This article won't be discussing large-scale robots used by the library as an institution (though they are pretty awesome—libraries are using automated systems for retrieval of material, circulation, and shelf-reading within the library, especially large ones—check out the Autonomous Robotic Shelf Scanning system in use in Singapore, or NYPL's train-like retrieval system). Our focus will be on robots that interact with the public, particularly kids, and are in use in programs or available to check out.

For example, the Longmont (CO) Public Library had a friendly robot nicknamed Bibli, with large, round eyes, a book-shaped sort of head, and Roomba-like base. It was programmed to roam the stacks, joking with patrons and finding lost books.¹ The Chicago Public Library has added five hundred Finch robots to its collections, and they're available for checkout to any adult library card holder.² They're also used within the libraries as part of youth programming.

Establishing Robot Contact

How do you start off with robotics programs? That's a question Sarah Kepple approaches in her book *Library Robotics*.³



The book, aimed at librarians with any level of previous knowledge, is a quick-start guide to building your program from scratch. She advises how to make the case to supervisors, what to purchase, which resources to beg and borrow from, and—this is the brunt of the book—what to do for stand-alone activities, camps, and clubs. Her focus is on integrating robotics with English Language Arts, but librarians with any goal could benefit from reading the introductory chapters.

First Thing First: Money

The first issue is, of course, funding, and that can come from many places. Most librarians I got in touch with did not fund their robotics programs solely from their regular budget. Requests to Friends groups, grants from IMLS/LSTA, donations by local business, organizations, or charities (specifically those involved with children), special STEM budgets, and gifts from patrons made up a large part of funding for most libraries. Some Illinois libraries cited Project NextGeneration, an initiative by Secretary of State/State Librarian Jesse White, as their source of funding.

What Can You Do?

Reach out to your local businesses and organizations. Chicago got their abovementioned Finches as a gift from Google

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Chicago.⁴ You can also broaden your horizons, though, and apply to nationwide grants; one library mentioned that they funded some of their robots through a grant from Toyota. Cary Memorial Library in Lexington, Massachusetts, used the online fundraising platform Razoo (similar to GoFundMe) to raise the \$5,000 they wanted to get their program off the ground.⁵

Next Up? Staffing

Who's going to run these programs? Anyone can do it, stresses Kepple; you don't need to be an expert to start experimenting and learning from your mistakes together with the kids. Especially with today's robots, which are so easy to start using from the box, there's no reason why the youth librarian can't try it. In fact, most librarians that I got in touch with say they've directed the programs themselves, learning alongside their young patrons. Staff members often used online video tutorials, relied on other departments like Tech Services or Teen/Adult Services for backup, and occasionally hired a professional to train staff or run the programs.

Another idea is using teen interns or volunteers, which works especially well for summer programs. The New Haven (CT) Library gave its teen interns a small paycheck, great job experience for their résumés and life, and city bus passes.⁶ In addition to being affordable, there are plenty of other benefits. "During summer, we have a basic Stem2Gether program where older kids help younger children," says Emily Bayci of Naperville (IL) Library. One plus is that teens are usually comfortable with the technology: "I often have teen volunteers help out who have never seen these robots before," says Annamarie Carlson of Westerville (OH) Library.

Another option is adult volunteers, whether from local robotics and tech groups or young-at-heart retirees. Kepple advises librarians to use local enthusiasts whenever possible; contact groups, clubs, and competitions in your area. People are usually happy to help out at their local library. Librarians can also learn and teach other staff members in other branches, becoming experts of sorts with enough experience.

The next step is to identify where to source the robots. There is the option of creating a robot with the help of the kids it will serve, such as was the case with Longmont's Bibli. A group of young patrons, most on the autism spectrum, collaborated with the local company Robauto to create the autism-friendly robot.⁷ (As an aside, robots are particularly suited to the autistic population, with their straightforward manner and lack of body language or emotions to decipher.) I spoke with Elektra Greer of the Longmont Public Library, who confirmed that the Bibli project is currently in the school district's hands; the excitement and community involvement in the project proved to be too much for the library's resources. "It grows quickly, and it's important to be sure your library's or city's leadership team can commit substantial resources to the programs," Greer advises.

While building the robots on your own sounds fantastic, it's not always so practical. Sometimes librarians need to just order the robot online, and with the wonderful variety available to us today, that option is easy and even affordable.

Some popular options:

- For the very young, Bee-Bots, Cubelets, and Cubettos seem to be a hit. They're easy to use and don't require computers or coding.
- Moving up, there's Dash & Dot, Sphero, Ollie, Finch, Ozobot, and more. These are fairly affordable, easy to learn, and come fully assembled and ready to use from the box; no robotics know-how is required. They usually support coding from several different programming languages and environments but also have the option for free-range driving and playing. (There is some setup needed to install the apps on your device and connect the robots.)
- For those who want to construct the robots themselves, there's VEX, LEGO Mindstorms, LEGO WeDo, and more. These are usually significantly more expensive and geared toward older kids.
- Other products include LittleBits (in my experience, they're just as fun and downright awesome for the staff to play with!), Makey Makey kits, and the Paper Mechatronics program. These may not be defined strictly as robots but can also be an integral part of STEAM programming.

Planning Your Programming Programs

So you've got the robots, the staff, and the space. What's next? That depends on your collection and your patrons. If you have one or two, you'll probably want to save them for special programming. If you're lucky enough to have a lot, offering them for checkout might be a great way to let kids (and their parents and siblings) experiment with coding at home. If you already lend out items like laptops, tablets, or hotspots, it's not a far jump to add these to the circulating collection. Try creating displays with coding and CS-related books and media near the robot-checkout area to boost circulation even more.

If you're keeping them in the library, you need to create programs. The target age group depends mostly on the kind of robots you've got and your goals. Most librarians I spoke to catered to the tween population (ages nine to fourteen), but some have created programs for the K-5 sector using simpler bots. The types of programs varied from one-time sessions to intensive clubs (weekly or biweekly sessions over a couple months) and camps (daily sessions during a school break). Libraries have also hosted "Robolympics," "Robot Expo," and "Robot Rally" programs, often with a family focus and the aim of introducing patrons to the robots. If you're working with the kids toward a competition or toward integrating robotics

Tips for a Successful Robotics Program

Based on tips from Coral Borg of Joliet (IL) Public Library's Black Road Branch

- Keep it simple. Introduce one concept at a time and review it with the kids.
- Time it right. You may need to make classes as long as an hour and a half to get it all in, and allow for a few minutes of show-to-parents time at the end. On the other hand, keep extra filler activities on hand in case they went faster than you expected.
- Discourage parents from hovering. The point is for kids to figure it out with their team and learn from their mistakes, not to be perfect.
- Collaboration breeds creativity. Progress happens faster when kids work as a team; those who go solo are inevitably left behind.
- Accept help. Teen volunteers are great for supervising, troubleshooting, and encouraging the kids. They can be someone to show off to or brainstorm with.
- Get to know your kids and be prepared to deal with classroom management issues. Giving concrete definitions of how long a turn is, providing fidget items for restless kids, or clearly delineating the day's activities can go a long way toward off-setting trouble.
- Communicate with parents: not only should recurring misbehavior be mentioned at pick-up time, but try to give praise when it's due. Parents might not hear that enough.

into an established STEM/STEAM program, then your sessions might be scheduled differently.

If you have kits, you can organize programs or clubs lasting weeks or months in which the kids design, build, experiment, and tinker. Even without the kits, there's a lot to do during clubs and camps: building obstacle courses, games, action

challenges, and more, depending on your type of robot. Robots can be great assets to passive programming as well; set up an arena (in your line of sight!), hang an inviting sign, and have kids record their scores or times on a whiteboard. There's also the option of using them for outreach and to impress patrons with how cool your library is!

Helping kids learn coding might be the greatest service we can do for our patrons. In the age of the Internet of Things, when much of the future job market seems to be in IT, valuable coding skills can make a difference in our kids' lives.

While it may seem daunting, we as a profession are proud to be embracing the future and doing the best for our communities. Try a robot yourself—you may find that it's not as difficult to work with as you may have thought, even for the non-tech type of person that many of us profess to be. And remember—you're allowed to make mistakes and have fun, mess up, and try again. Isn't that what we tell our kids? 🤖

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