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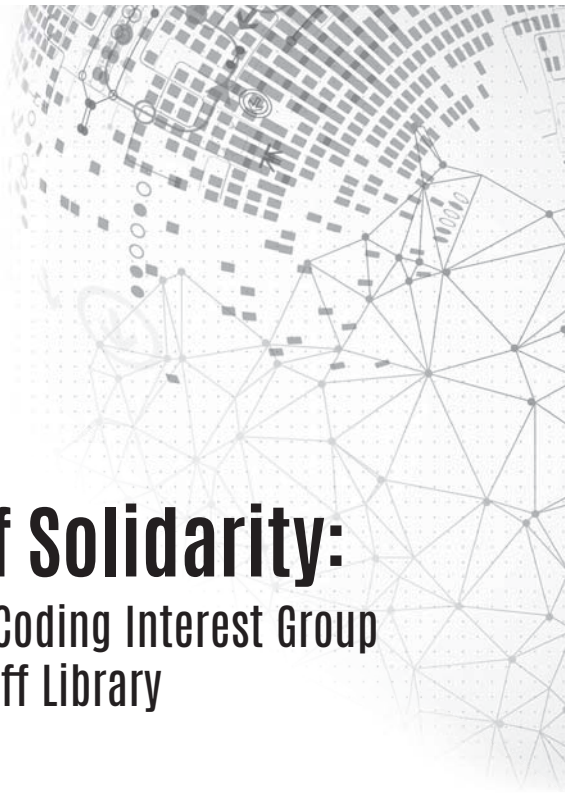
# The Practice of Solidarity: Forming a Collaborative Coding Interest Group at AUC Robert W. Woodruff Library

Joshua D. Hogan
*AUC Robert W. Woodruff Library*

Justin de la Cruz
*AUC Robert W. Woodruff Library*

CHAPTER 21



# The Practice of Solidarity:

## Forming a Collaborative Coding Interest Group at AUC Robert W. Woodruff Library

Joshua Hogan*
Metadata & Digital Resources Librarian
Robert W. Woodruff Library, Atlanta University Center Library

Justin de la Cruz
Subject Librarian, Music and Psychology
Robert W. Woodruff Library, Atlanta University Center Library

## Introduction

Of the many values that inform the practice of librarianship, "service" stands as one of the most essential.[1] Ours is a service-oriented profession, dedicated to serving all library users, including both patrons and colleagues. This core value calls us to stand in solidarity with the communities we serve and with each other, to provide mutual support for shared endeavors, and to labor for excellence in our profession. Indeed, the American Library Association's explanation of Service as a Core Library Value includes the assertion that, "We strive for excellence in the

profession by maintaining and enhancing our own knowledge and skills [and] by encouraging professional development of co-workers."[2] As our profession continues to evolve in the light of emerging technologies, it is, therefore, imperative that we find ways to "enhance our knowledge and skills" in this area to better serve our patrons. By the same token, this core value urges us to do all in our power to support our colleagues as they also continue to learn and grow as twenty-first-century library and information professionals.

At the Atlanta University Center Robert W. Woodruff Library (AUC Woodruff Library), librarians and staff found themselves facing an increasing need to understand information technology and computer programming and the programming languages that lie behind them. For example, reference questions about computers and technology have become more frequent, while the use of digital devices and mobile apps to access library materials has become ubiquitous. This need has been particularly true for web technologies and languages, such as HTML5, CSS, and JavaScript. Librarians familiar with these topics are better equipped to address common reference questions, edit library websites, create blog posts, design effective research guides via platforms such as LibGuides, and contribute to courses in learning management systems.

Recognizing this situation, staff at the AUC Woodruff Library formed an interdepartmental Coding Interest Group (CIG) to explore topics in computer programming like markup languages and basic web scripts in a collaborative setting. Participants in the group worked on projects such as updating the library's website, enhancing the library's mobile app, creating a workflow for digital preservation activities, and improving the research guides available through the library website. The CIG, as a result, was designed to focus on peer instruction and learning support, grounded in the Core Library Values of Service and Education and Lifelong Learning. It was important to the participants involved to form a collaborative group of librarians and paraprofessionals because the need to code impacts the entire library and because differing perspectives enhanced the discussion and the skills available for sharing. The skills learned in the way they were learned allowed us to deepen our lifelong learning commitment while also extending our ability to serve our patrons. The most obvious impact of our strengthened skills is, perhaps, in the public services realm, but service includes how behind-the-scenes employees perform their work.

In addition to public services staff, other librarians at AUC Woodruff Library also need enhanced skills in information technology as the library strives to expand its digital holdings, particularly of archival material. The librarians and staff in the Digital Services Department and the Archives Research Center actively build online collections in the institutional repository, create online exhibits on the library's instance of Omeka, and develop online finding aids in the ArchivesSpace

platform. Additionally, as digital collections grow, the library must find ways to preserve the digital content for future users. Learning coding skills can help staff members in these areas use technology to make access and preservation of digital assets easier and more reliable. These efforts translate into library systems that are easier for our patrons to use, which remains a vital library service component in a time when so many older materials are being digitized and when so many newer materials are born digital.

As a medium-sized institution serving a consortium of HBCUs, the AUC Woodruff Library has limited funds to hire specialized staff for the activities above. The library has a small staff of IT support professionals and a part-time contract developer, but it has no dedicated web developer or programmer on staff. Therefore, it is even more imperative that the librarians and support staff of the library learn to code as their professional development directly impacts the effectiveness and quality of the services provided to library patrons.

Professional development for librarians tends to be a straightforward, structured process. It may involve pursuing specialized certifications, attending workshops or webinars, or progressing through online courses in a self-directed manner. For technology topics, however, and especially for computer programming, there is a steep learning curve and, accordingly, alternative approaches to professional development should be considered. The Coding Interest Group has pursued different approaches to learning and peer instruction, including a traditional classroom-based method using popular educational websites and a project-based approach to learning. While there are distinct benefits and challenges to both styles, project-based learning seems to be a good fit for librarians trying to learn how to code. As technology skills become a necessity rather than a luxury, libraries should keep in mind that they play a pivotal role in the access to and learning of technology for their communities. Core values of service and professionalism indicate that librarians should continue to develop their own technology skills in order to serve their patrons.

## Literature Review

In recent years, there has been a clear cultural impetus for increasing digital literacy, both inside and outside of libraries. In 2015, the administration of President Obama launched TechHire, an initiative geared toward expanding technical training and linking tech employers to new communities.[3] Another recent program, titled ConnectAll, also introduced by the White House, involves a component with the Institute of Museum and Library Services to deliver training in digital literacy skills nationwide.[4] Within the library field, the American Library Association formed a Digital Literacy Task Force to offer recommendations on

libraries' roles in this area.[5] The recommendations line up well with the library's commitment to service to our patrons and to our profession, and lifelong learning by librarians and library staff is key to fulfilling these goals.

The need for libraries and librarians to be engaged with digital literacy and emerging technologies is clear from the increasingly larger role that these technologies are playing in society. Examples include the rise of mobile apps, the widespread reliance on learning management systems, the advent of portable and wearable technology, the rapid expansion of broadband internet, and the development of virtual reality systems. Librarians must respond to the evolving needs of patrons who will continue to utilize traditional resources while also searching across rapidly changing online environments, software programs, and other digital platforms. Since computer programming is at the core of all of these advances, learning how to code can be beneficial for librarians in terms of understanding information in context—how it is processed, shared, stored, and retrieved in digital environments.

The need to understand programming is also evident from many recent open library job descriptions. Monica Maceli explored the frequency of technology requirements in job postings from the year 2014 at the Code4Lib job website (http://jobs.code4lib.org/). Web technologies (XML, HTML, CSS, JavaScript, etc.) were particularly prevalent in job listings not only for technical positions such as "Systems Librarian" but also for positions that would provide direct support to the library's patrons, e.g., "Digital Scholarship Librarian."[6] Maceli concluded that it is "vital" for anyone who wishes to become a "technologist" to have a "willingness and aptitude to quickly adjust to a fast-changing technological landscape."[7] Again, we see the importance of commitment to lifelong learning for librarians. Job listings at less technical sites such as joblist.ala.org also illustrate the importance of learning computer programming and digital technologies. For example, recent listings for public services positions, such as humanities librarian, include such language as, "Familiarity with digital humanities research tools and methods."[8] Even in a seemingly non-technical position, it is clear that computer programming skills are increasingly in demand as ways to serve the public and profession.

There has been some research on librarians and computer programming, though not much discussion about librarians starting their own learning groups. Matt Enis provided an overview of projects carried out by participants in the 2012 ALA Library Code Year Interest Group, which served to highlight the importance of coding for librarians. Enis argues that learning code can "help librarians customize and improve the usability of web-based resources and vendor interfaces."[9] Many of the participants stressed the importance of using code to harvest the "low-hanging" fruit of automating repetitive tasks such as editing MARC records or customizing web-based resources like reference chat widgets. Others used coding

to provide more user-friendly interfaces and new public services for their libraries. Jason Griffey of University of Tennessee at Chattanooga launched a project to reformat display results from Serials Solutions database products for easier patron interaction. Bohyun Kim argued that coding skills "will help libraries to adapt themselves to this new environment of information abundance," with the example of pulling data from social media and Google Maps to display the information on library websites as a sort of content curation service.[10] This would assist with library marketing and would help patrons become more engaged with other public services. From freeing up time to creating new digital collections for patrons, coding activities provide new opportunities for enhancing library services.

There are plenty of free and inexpensive resources available for librarians learning how to code. These resources make it possible to design programs in libraries to help staff and patrons learn vital coding skills. For example, Brigham Young University's Harold B. Lee Library created a "self-directed training program" titled Technology Challenge, designed to encourage their librarians and staff members to expand their knowledge of computer programming and emerging technologies. The librarians who designed the program found it "was successful in teaching technology skills and in promoting lifelong learning."[11] Andromeda Yelton has provided a helpful annotated bibliography of online resources, including a discussion of online communities like StackOverflow and code repositories like GitHub. Yelton also presents a concise set of tips for new learners. Included among the tips are: finding a relevant project to work on in order to produce real-world outcomes; relying on existing sets of code in order to avoid writing from scratch; and recognizing that learning code will be a difficult task and that learners are expected (and should be allowed) to feel challenged and overwhelmed at times.[12]

Bohyun Kim discusses similar strategies that librarians can use to code more effectively: think about how learning code will apply practically to the library environment, find or build a community for social learning and support, and jump into a real-world project as soon as possible.[13] These tips align with an educational approach known as Project-Based Learning (PBL), which allows students to learn by working on practical projects with tangible outcomes. Although there are various approaches to PBL, Fallik, Eylon, and Rosenfeld present a breakdown of the key components involved: projects are central to the curriculum (centrality); projects are driven by a research question that reflects the core concepts in the discipline (driving question); students construct knowledge during the process of working on project components (constructive investigations); students can control various aspects of project management (autonomy); and the projects being worked on are "realistic or authentic" (realism).[14]

Project-Based Learning has been shown to be an effective way to provide training for prospective computer teachers[15] and continuing professional

development for science and technology teachers.[16] It also appears to be an ideal approach to teach computer programming, since the subject is "normally presented in a confusing, hierarchical manner where students start by learning lower-level skills and then build on them piece by piece until they achieve some level of fluency. In the case of coding … this implies that students will learn the basics of syntax first and then gradually move on to semantics, structure, and finally style."[17] Effective programmers will be familiar will all levels of the hierarchy and use each skill as needed, but new students may not understand how all of the pieces fit together. One benefit of PBL is its way of letting the learner decide what to focus on, which can lead to a better holistic view of the process:

> First, projects demonstrate … that it is not necessary to cover many topics or reach the end of the course before being able to construct something interesting. Second, projects show that programming is the balance of several domains apart from just algorithmic and programming languages. And third, projects confront students with real-world like problems from different domains.[18]

Bohyun Kim also suggested that "[t]he library field has plenty of untapped potential for building a coding community of its own."[19] In addition, Erin Fields of the University of British Columbia points out that there is "no lack of learning opportunities" for professional development in librarianship. She states: "Video lectures, podcasts, and interactive websites are just a few ways by which traditional education models can be supplemented, or in some cases replaced."[20] The formation of a coding group at the AUC Woodruff Library was a response to this call for action, particularly in regard to forming a social support group, one in which we could practice service and solidarity with one another while taking on this enterprise.

## Group Activities

The Coding Interest Group consists of a mixture of reference librarians, archivists, systems librarians, and support staff. Participation is optional and open to anyone interested in attending. Meeting attendance therefore fluctuates between a few members and about a dozen. The group's organizers, Joshua Hogan and Justin de la Cruz, have a combined experience of reference work, technology training, website development, and library systems support, which has assisted with leading this group. At the start, group members had varying levels of experience with computing topics and little exposure to learning in an interactive group setting. Accordingly, the formation of the group was slow and steady, with organizational adjustments made over time as needed.

One early group component that worked particularly well was a set meeting schedule. In particular, meeting on a weekly basis provided enough consistency for engagement in the topics without experiencing intellectual fatigue. Learning technology generally and computer programming specifically requires a high level of engagement on a frequent basis, much like acquiring fluency in a foreign language. Jenkins claimed that coding is such a difficult subject to learn that students should be provided training in coping skills to overcome the stress and anxiety inherently produced from their studies:

> They were probably used to performing well academically [in other subjects] and had developed a set of tried, tested and trusted learning and study skills. To arrive in a setting where they are confronted with a totally new topic that does not respond to their habitual study approaches, and where a single semi-colon is the difference between glorious success and ignominious failure, must surely represent a 'radical novelty' in [Edsger W.] Dijkstra's terms.[21]

Inevitably, an early question for those learning computer programming is which language to study. Jenkins asserted that programming requires multiple skillsets and that "it is only when a programmer has had the experience of more than one language that [higher level] concepts actually become apparent."[22] Accordingly, there is no single computer language that is uniquely better than another to learn, nor is there one that is best to learn first. Utility and context play a big role, and Yelton suggested that "the best language for you to learn depends on your personal taste, whether you have ready access to a community of experts, and above all the project you want to write."[23] The early meetings of the Coding Interest Group addressed these topics by polling members on what they had experience with and what they thought would be most useful to learn for their library work. There was a general consensus that HTML presented an opportunity for everyone to build on some existing knowledge, and although it may not be considered a true programming language (in the sense that it doesn't process inputs and outputs nor use conditional statements, loops, or other hallmarks of dynamic languages), HTML is used widely throughout library work and serves as a great first topic to learn for aspiring computer programmers.

The group first turned to popular online learning websites for a curriculum. Codecademy offered an HTML & CSS course (https://www.codecademy.com/learn/web) and edX.org had created a series around HTML5, starting with a general introductory course (https://www.edx.org/course/html5-introduction-w3cx-html5-0x-0). These lessons were mostly structured like traditional courses:

they included reading materials (with some videos), exercises, incremental exposure to new topics, and quizzes or milestones to reinforce learning. Although Codecademy presented exercises in an interactive way and edX included videos, both had the limitation of working on HTML in a vacuum: any materials that learners create are kept within the learning software, so students cannot easily export their work to freestanding webpages. Users were also presented with a linear set of lesson plans, which encouraged a strong adherence to the order in which topics were to be learned and discouraged any creative explorations of different topics.

Members of the Coding Interest Group completed each course individually while meeting as a group to discuss that week's lesson plans, topics, and practical applications of the knowledge they had gained. Following the completion of both courses, all group members were able to demonstrate an ability to read and interpret HTML and CSS, locate basic errors, and fix or add to existing website code. They also gained experience in using Brackets, one of many available software programs designed for generating code, and built-in developer tools in internet browsers like Chrome and Firefox. Several group members used what they learned to better address reference questions relating to websites and HTML and to update LibGuides and blogs. One additional benefit was the weekly opportunity group members had to interact and learn with colleagues from different library projects, which led to some work projects unrelated to the Coding Interest Group.

However, after completing both courses, the group searched for another way to approach learning computer programming. The group's organizers introduced the idea of Project-Based Learning, which is a learner-driven approach that allows for more flexibility and produces tangible outcomes. Then, instead of a discussion around what topics the group wanted to learn, there was a brainstorming session on what projects the group wanted to do with coding. By entertaining every suggestion, from the very minor to the highly unrealistic, the group drew up a list of possible projects and settled on one that not only related to HTML and CSS, but included more computer programming topics and seemed reasonably achievable. This approach transformed the group's approach to learning by adhering to the tenets of Project-Based Learning:

- *Centrality*: The group placed the project, not the subject matter, as the central focus in the learning process.
- *Driving question*: The library had three flat-screen televisions showing news. The group project related to displaying content on flat-screen televisions that were already in place in the library, with the driving question being, "How do we use the televisions we already have to promote library services, materials, and events?"

- *Constructive investigations*: Since the group had been learning about how to use HTML to construct websites, the investigation began as to how to create a website that could show promotional materials. The group also looked into how to best display the website on the televisions.
- *Autonomy*: The group's organizers assigned roles to group members based on various needs, including building the website template, finding and implementing code for scrolling pictures, and displaying the website on a television
- *Realism*: The proposed outcome of the project would be a proof of concept that the library could use Raspberry Pi computers to display various materials on flat-screen televisions via a custom website build by the group.[24]

Assigning different members to various stages of the project's completion provided group momentum, individual encouragement, and built-in project milestones. Project-Based Learning provided an ideal template: the group identified a problem, proposed a project solution, developed a breakdown of the project, drafted a flexible timeline, separated group members into teams, and worked together to support each other's efforts. As various parts of the project became realized, group members would share time teaching others what they had learned. Following the completion of the project, the group will analyze what happened over the course of the project, record the successes and challenges involved, and present the outcomes to their colleagues. The next project and set of lessons then follow the same basic structure as this first project.

## Conclusion

Generally speaking, professional development relating to technology in libraries can be intimidating to some library staff no matter how much experience they have in the profession. For those who feel alienated or frustrated by technology learning, there are a few practical things to consider. Creating a routine for your learning can prove to be very successful: consider scheduling a set time to learn, even if it's only a few minutes, on a daily or weekly basis. To avoid distractions, try to learn in a space away from your personal work area, if possible. Additionally, form or join a group to learn; you can gain important perspectives from your colleagues and learn from their experiences. Pursuing topics that seem interesting even if they have no immediate, apparent applications to your library work can prove to be a useful way of encouraging your early engagement with technology learning. And taken together, group support and intrinsic motivation to learn will help when you have to push through the inevitable challenges associated with learning social media, web development, mobile apps, and other technology topics that are directly related to library services.

Specifically, computer programming is a complex and challenging subject to tackle, and it takes effort and determination to master, especially for those who are full-time practitioners of another field, such as librarianship. Learning in a group can, however, make the process more manageable and enjoyable. Having a set time to learn in a social setting provides an avenue for deepening relationships and offers opportunities for supporting one another while exploring new, and often difficult, concepts. It provides a consistency and external motivation that doesn't come with individual learning efforts. The group approach also ensures that different skill sets are brought into play and that participants' experiences can help fill gaps in each other's knowledge. The group dynamic forged through the CIG has been complementary, rather than competitive and is illustrative of service in a library setting. In other words, we take responsibility for the projects and learning outcomes undertaken by the entire group.

Pursuing learning activities as a group also enhances the value of the many freely available online learning materials. These materials, which include online courses, guides to coding, HTML authoring software, and open-source developer tools for making apps on mobile devices, are wonderful resources but are often not sufficient on their own for people brand new to the subject to achieve a moderate level of fluency. Our approach with CIG provides a safe, comfortable learning environment where people are willing to take new approaches to learning and can leverage the advantages of these materials through mutual assistance.

The group found that the traditional classroom experience only goes so far in terms of learning computer programming. Studying computer science theory, best practices, or other topics in isolation provided some sense of achievement in its own right but didn't translate into practical outcomes or aid with learners' intrinsic motivation levels. Project-Based Learning provided an alternative approach to computer programming that assisted the Coding Interest Group with its mission. By selecting a project that meets a library need and structuring a curriculum around that project, the group found more interest in the subject matter, became more creative with coding, and became more focused by only addressing topics in computer programming that were immediately relevant to their current work.

Because of our profession's devotion to professionalism, service, and lifelong learning, we should stay informed on the technology topics in which our communities find interest. Developing our skill sets to include practical coding, applied to real-world tasks, enables us to serve our patrons and each other at a higher level. Service and Lifelong Learning are mutually necessary values; you cannot have one without the other. Libraries serve as community centers and educational centers and can serve to encourage novice learners of computer programming to develop their own project ideas and seek out the resources needed to make them work. Librarians should form their own groups for professional development but

can also work to create coding clubs for patrons, which has already been done in some libraries and can be a future avenue of research in this area.

## Notes

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