# FULL PROPOSAL ABSTRACT, NARRATIVE, AND SCHEDULE OF COMPLETION

*App Authors: Closing the App Gap II*

The applicant, the Graduate School of Library and Information Science at the University of Illinois at Urbana-Champaign, seeks funding for a three-year long project grant addressing the focus area of Learning Spaces in Libraries. *App Authors: Closing the App Gap II,* which builds on our previous planning grant *Closing the App Gap: From Plan to Project I,* will begin October 1, 2015 and conclude September 31, 2018. Funding will support project staff—a 40% research assistant, a project manager, a communications coordinator, and a consultant—and provide a portion of the travel and tool costs to engage in a multi-site project designing and implementing app-creation curricula for children from eight to twelve. Our core partners, who will be our project sites through years one and two, are the Champaign County (IL) Unit 4 School District, the Douglass Branch Library (Champaign, IL), the Frederick County Public Libraries (Frederick, MD), and the Springfield Public Library (OR); two to five additional sites will be recruited for participation in the third year of the project for a total of six to nine sites.

With STEM education a current national priority, libraries can play an important role in creating STEM learning spaces for young people, especially those young people who have limited access to technology at home. One of the main current educational challenges, noted in President Obama's "Educate to Innovate" initiative, is the encouragement of young women, minorities, and people from low-income backgrounds to explore STEM subjects and careers. Early involvement in STEM activities offers an opportunity for girls and underrepresented minorities to develop their interest, and extracurricular programming allows young people the chance to explore, and play, make mistakes and learn, outside of the confines of the classroom. Such early exposure frames STEM work as a field in which they can be contributors and participants, not merely consumers. Apps provide an excellent entrance point for coding and STEM explorations, since even young people without their own tablets or smartphones are likely to possess basic competency with their interfaces; young people who think STEM subjects are too hard will readily play a game on a tablet or enjoy interacting with an e-book. Because of the technology's comparative low cost, many libraries are able to make tablets and apps available to young users, and they seek ways to maximize their impact.

*App Authors* will create a curriculum and tools for use in school and public libraries that will teach young people to create apps and allow them to share their achievements with other children; that curriculum will be disseminated for adoption at other school and public libraries. The project will provide young people with early programming experience, and further establish the place of libraries as a site of opportunity to engage youth in STEM exploration and digital development. This project grant addresses IMLS Strategic Goal 1; it "places the learner at the center and supports engaging experiences in libraries and museums that prepare people to be full participants in their local communities and our global society."

***App Authors: Closing the App Gap II***

**Overview**

*App Authors: Closing the App Gap II* is a three-year project that will be led by Dr. Deborah Stevenson, Director of the Center for Children's Books, with co-PI Dr. Kate McDowell, Associate Professor, both at the Graduate School of Library and Information Science at the University of Illinois Urbana Champaign. The proposal is being submitted under the Project category, and it addresses the focus area of Learning Spaces in Libraries. Over three years, we will work with a total of six to nine school and public libraries to present app creation programming for children aged eight to twelve at those sites. The project's goal is the creation of a curriculum for use in school and public libraries that will teach young people to create apps and allow them to share their achievements with other children; that curriculum will be disseminated for adoption at other school and public libraries. The project will provide young people with early programming experience and further establish the place of libraries as a site of opportunity to engage youth in STEM exploration and digital development.

**Statement of need:**

*STEM learning*

Awareness of the need to stay competitive in a global marketplace—and for the emerging workforce to find careers in growth industries—means a rising focus on STEM education for young people. This emphasis goes as high as the office of President Obama, who launched the "Educate to Innovate" campaign in 2009 to motivate young people to excel in the STEM fields and to encourage the growth of STEM literacy, seeing it as vital to meet the "grand challenges" facing the country and the world. And the need for STEM education is documentably acute. Code.org predicts 1,000,000 more jobs than students in computer science by 2020, yet many K-12 schools offer no programming opportunities at all. The National Science Foundation states that impending baby boomer retirements mean a departure of older scientists and engineers from the workplace, which will leave a gap in many fields—and also create an opportunity for younger professionals in those fields.

*STEM diversity challenges*

One of the main challenges, also noted in President Obama's initiative, is the encouragement of young women, minorities, and people from low-income backgrounds to explore STEM subjects and careers. Disparate levels of STEM achievement exist at many important levels of education, and the higher the education, the greater the gaps. The National Science Foundation reports that while women's representation in STEM careers is increasing, they still constitute only 18% of bachelor's degrees in computer science and 19% in engineering; they are also underrepresented in those professions, making up only 13% of engineers and 25% of professionals in computer and mathematical sciences. African Americans, Latinos, and Native Americans/Alaska Natives constitute 13% of the engineering degree holders in 2011, despite their proportion of the overall population being

over 26%; computer science sees similar underrepresentation. As early as 2002, mathematics educator Robert Moses theorized that such educational gaps would make young minorities into the "designated serfs of the information age." Additionally, there are indications that even schools equipped with technology use it only to teach comparatively simple skills, that access is most available to those who least need it, and that "many schools that serve large numbers of students of color are 'technology rich, but curriculum poor.'" Additionally, studies indicate that computer science and STEM-related subjects are perceived as being too hard, and that this perception of difficulty is a particularly significant bar for underrepresented minorities; those fields are also perceived as "expensive" and "exclusive," suggesting that young people feel the obstacles to such subjects' study are only surmountable for the privileged few.

Early involvement in STEM activities therefore offers an opportunity for girls and underrepresented minorities to develop their interest, and extracurricular programming allows young people the chance to explore and play, make mistakes and learn, outside of the confines of the classroom and graded work. Such early exposure frames STEM work as a field to which they can be contributors and participants, not merely consumers. Author Brendan Koerner, relating the work of computer scientist J. Paul Gibson and others, also argues that early education in coding is one of the most valuable experiences for developing critical thinking and introducing kids to an important career track. Like our pilot project in our planning grant, our program aims to reach preteens ages eight to twelve, ages when young people are keen to explore and likely to benefit substantially from enrichment.

*Apps and tablets*

With our work on *Closing the App Gap,* we joined the ongoing library and educational discussion about app use; at conference panels with field leaders such as Cen Campbell of Little eLit and in informal professional discussion associated with the project it was clear to us that apps and tablets continue to feature strongly in classrooms, and that proficiency with them is emerging as an important educational skill. Apps provide an excellent entrance point for coding and STEM exploration, since even young people without their own tablets or smartphones are likely to possess basic competency with their interfaces; young people who think STEM subjects are too hard will readily play a game on a tablet or enjoy interacting with an e-book. A recent survey by Harris Poll on behalf of Pearson indicates that young people find tablets highly engaging and strongly support their greater educational use; African-American and Hispanic students were particularly likely to support their use in the curriculum and to believe smart interfaces are advantageous for learning.

*Libraries and STEM learning*

As noted by scholar Mega Subramaniam, libraries have considerable untapped potential as venues for cultivation of STEM learning and exploration, and their role is ripe for valuable expansion. Libraries have for several years now been leaders in the makerspace movement, providing physical spaces that offer tools for exploration, play, and experimentation ranging from fab labs (fabrication labs) to

hackerspaces to DIY crafting opportunities. The makerspace movement has had particular importance for youth; makerspaces offer young people a chance for concrete creativity, encouraging young people to dive into hands-on learning and develop problem-solving skills outside of classroom strictures, skills that may lead students into STEM subjects and careers but will serve them in many future endeavors. In a space away from grades and recorded judgment, youth are free to experiment and grow. Libraries are just beginning to explore the possibility of offering app-creation opportunities, with institutions such as the Cuyahoga Public Library (Ohio) and the Skokie Public Library (Illinois) holding workshops and "App-a-thons."

But as they always have, libraries and schools rise to meet these challenges on ever-tighter budgets. The focus on STEM programming and makerspaces especially can be a challenge for the finances, since such programming can involve technology that's difficult to affordably scale for large numbers of students and young patrons. Librarians therefore seek ways to maximize the impact of the technology they do acquire. And since institutions often acquire hardware before creating a plan for its use, librarians must devise curricular and programming practices to give that hardware value.

**Impact**

Our prior planning grant, *Closing the App Gap: From Plan to Project I,* was built on the need to close the youth app gap, the division between those young people who regularly have access to tablets and smartphones and those who do not. Our study confirmed the value and appeal of app and tablet programming with young people and verified the usefulness of the library as the site for such programming. We focused on preteens, young people approximately eight to twelve years old, and found this age group was excited by apps and poised to work more deeply with tablets. We also noted that existing apps for young people disappointingly lacked diversity (out of our nearly 200 apps evaluated, fewer than 15% presented non-white people in any significant roles); our young subjects, who were almost all African-American, clearly noticed this lack and responded with particular enthusiasm to apps that featured people who looked like them. We were also struck by the young people's collegial approach to app use; rather than finding tablets a solitary diversion, our subjects leapt immediately to collective exploration and sharing of successes.

We therefore believe that the App Authors project is ideal to address several current needs in STEM education and will indeed confirm the library as a learning space. The project will:

1. Provide librarians in public and school libraries with tools to help them teach children computational literacy through app design.
2. Empower young people to represent themselves in apps.
3. Allow for valuable mentoring and peer experience as young people work with one another and share their creations with young audiences.

With our core partners, our programming sites for the second year of our project, we reach four institutions: one school system, one county library system, and two public libraries. We will then expand from those core partners to launch programming in our third year at two to five additional sites, chosen for breadth of dissemination. Over a total of six to nine institutions, we have the opportunity to reach a large number of young people; the curriculum we will subsequently broadly disseminate has the potential to reach thousands more. Our partner sites vary in size, in resources, in geographical location, and in population served, ranging from a small branch library, Champaign's Douglass Branch, to a large county system, Frederick County Public Libraries; from a school system, Champaign County's Unit 4, to a single library serving a diverse town, the Springfield Public Library in Oregon. We will accommodate the needs of these varied institutions, thereby demonstrating flexible approaches that will be viable for a wide range of schools and libraries.

This project has great potential to be widely applicable to other libraries, especially those reaching underserved populations. While technology expenditures can be costly, tablets are relatively inexpensive and present touch-screen interfaces that are easy to use for youth with minimal literacy or for whom English is a second language, and this program adds to such technology's value in library and school settings. Tablets' friendly interface and recognizability makes working with and designing for them an accessible and appealing goal that can draw young people otherwise hesitant about coding. Such benefits will make the project's curriculum rewarding and feasible to implement as well as replicable in a variety of settings.

By the completion of our project, we will have involved youth in multiple systems and at multiple sites across the country, have established the value of app-creation programming and libraries as a site for such STEM-related growth; we will have created and employed programming curricula to allow schools and libraries to replicate and adapt our programs for their own use. The results will be shared widely through conferences and publications, and we intend also to draw on GSLIS's extensive distance learning structure to offer online seminars, in a multipronged strategy for reaching a new group of youth services librarians and educators who can further disseminate the curriculum and program plan.

Our prior project illustrated the ongoing difficulty of research in a public library space; young people have little interest in taking tests or surveys in their free time and therefore regularized feedback is challenging to obtain. We therefore plan to measure outcomes in other ways: we will track program attendance; we will survey the onsite professionals about the effectiveness of the curriculum; at planned peer-sharing sessions for the young participants, we will observe and collect non-individually identifiable responses; and we will explore the possibility of a third-year site that allows for more regularized participation that could include a survey of our participants.

**Project design:**

The project will begin on October 1, 2015 and end on September 31, 2018.

*Year One: Design, October 2015-September 2016*

3 months (fall) — PIs, project coordinator, research assistant, and consultant

- app-building tools selection, testing, and planning for curriculum building
- begin work on basic lesson plans for sessions in the App Authors curriculum
- regular meetings and progress reports
- create software demos to show partners
- discuss recruitment processes to insure invitations to and inclusion of libraries in underserved communities and schools
- submit IRB proposals for spring and summer piloting of curriculum

3 months (winter) — research assistant, PIs, and partners

- schedule monthly virtual meetings with partners for winter and spring
- share plans and software demos for input from partner institutions
- create initial plans for how to structure curriculum (probably 5-6 sessions that we or librarians lead at each site) so that it will work for each kind of institution
- choose and test online repository for sharing apps
- finalize IRB approvals

3 months (spring) — research assistant, PIs, and partners

- continue monthly meetings and identify on-site session leaders
- develop curriculum
- travel to each partner institution for face-to-face meetings to confirm plans
- work with on-site leaders to test technology and confirm local tech support
- confirm session leader, either research assistant or on-site librarian
- pilot curriculum sessions at Champaign School District

3 months (summer) — research assistant, PIs, and pilot partner

- pilot curriculum sessions at Douglass Branch Library
- seek input from partners and modify curriculum based on pilot sessions
- plan data collection, including observations, interviews with librarians and children, and other data needed for evaluation
- IRB application for evaluation of implementation at partner sites
- finalize curriculum

*Year Two: Implementation, October 2016-September 2017*

3 months (fall) — project coordinator, research assistant, consultant, partners

- meetings to review final curriculum with partners
- preparations at partner sites, including technology acquisition and testing as well as reaching underserved populations in each community
- coordination with librarians who will be leaders of App Authors sessions to insure that they have what they need to implement the curriculum
- identify sites for year 3 further dissemination

3 months (winter) — project coordinator, research assistant, and consultant

- meetings to review technology preparations and feedback from partner sites
- technology troubleshooting, including hardware or software updates
- meetings to plan implementation at school partner site
- workshops led by research assistant to train the on-site librarian leaders at public library sites

3 months (spring) — research assistant and PIs with school partner
- implement curriculum in school setting, including approximately 5-6 research-assistant-led sessions and plans for a continuing afterschool club
- insure that all apps are downloadable on app sharing websites
- facilitate sharing of apps with intended audience (peers or younger children) and schedule sessions of user experience feedback for the app authors
- conduct evaluation of implementation
- meetings to plan implementations at public library partner sites, including 5-6 librarian-led sessions in a program series or club format

3 months (summer) — research assistant and PIs with public library partners
- implement curriculum in public library settings, at partner libraries
- travel to partner sites to insure coordination and facilitate evaluation
- facilitate sharing of apps with intended audience (peers or younger children) and schedule one or more sessions of user experience feedback for the app authors, across all of the public library sites
- conduct evaluation of implementation
- confirm expanded sites for year 3 implementation
- prepare curriculum for dissemination to new sites

*Year Three: Refinement and Dissemination, October 2017-September 2018*
3 months (fall) — project coordinator, research assistant, and consultant
- disseminate curriculum to new sites
- virtual App Authors meetings with partner sites as co-presenters
- involve partner sites in structuring the teaching of the curriculum
- update and troubleshoot technology as needed
- IRB application for data collection at expanded sites

3 months (winter) — research assistant and PIs
- conference proposal submissions (ALA, AASL, ALSC, YALSA, ISLMA, educational technology conferences)
- virtual meetings as training for expanded sites in using the curriculum
- planning for sustainability of program, of curriculum, and of apps

3 months (spring) — research assistant and PIs
- implementation at expanded school/school library sites
- interviews with school librarians, evaluation forms from children if possible

- create opportunity for cross-site communication among youth participants at school sites through virtual meetings and youth-led demos of their apps
- schedule sessions of user experience feedback for the app authors
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3 months (summer) — research assistant and PIs

- implementation at expanded public library sites
- interviews with public librarians, evaluation forms from children if possible
- create opportunity for cross-site communication among youth participants at all sites and youth-led demos of their apps
- schedule sessions of user experience feedback for the app authors
- conference dissemination (aim for three major conferences)
- finalize grant reporting and publication dissemination

**Diversity plan:**

Diversity was one of the concerns driving the creation of our prior planning grant, *Closing the App Gap,* and it remains a cornerstone of the currently proposed project. Our core partners all serve diverse populations of youth. The Unit 4 School District of Champaign County serves a majority-minority student body, with 39% of its students African American and over 55% of its students from low-income families. The Douglass Branch Library of the Champaign Public Library serves a primarily African-American community. The Springfield Public Library is situated in Springfield, Oregon, a town with a significant Latino population (12.1% at the last census) and a high percentage of low-income residents. The Frederick (MD)County Public Libraries serve Frederick County, which is 9% African American and 8% Latino; the city of Frederick itself is 14% Latino and 18% African American. We will ensure that our programming is inviting to young people not already interested in coding and STEM, and as we create our plans for programming at those sites, we will work with our partners to identify methods to particularly encourage the participation of girls and of minority and underrepresented youth in those schools and libraries. Those methods will become part of the curriculum and protocols we disseminate as an outcome of the project.

Additionally, in our recruiting plans for our two to five additional third-year partner sites, we will prioritize schools and libraries in areas with a significantly minority or underserved population and explore ways to reach out to such possible participants. We are already in talks with two possible subsequent sites in communities with large minority populations. We are also exploring complementary funding opportunities, including possible corporate donors, to contribute funds or hardware that would provide an opportunity for institutions that currently lack technology and technology budgets to participate. The result will be a project that excites interest in apps, coding, and STEM in young people who may not otherwise have developed their potential in this area, and a template that allows multiple sites to adopt a curriculum that will engage and enrich underserved young people.

**Project resources: personnel, time, and budget**

*Personnel:* The key personnel will be the co-PIs, Dr. Kate McDowell and Dr. Deborah Stevenson. Dr. McDowell, an associate professor at GSLIS and dean for student affairs, is a former librarian at the Urbana Free Library. Dr. Stevenson, the director of the Center for Children's Books and the editor of the *Bulletin of the Center for Children's Books,* has been with GSLIS since 1992. Together they completed the successful IMLS-funded planning grant *Closing the App Gap I: From Plan to Project* in 2013-2014. We will draw on the time of GSLIS's Research Services Coordinator, Susan Lafferty, to manage our budget, to ensure successful completion of the Institutional Review Board process and timely production of deliverables, and to work with the university's Office of Sponsored Projects and Research Administration to ensure conformance with regulations. Our communications plan will be in the hands of one of the GSLIS communications office staffers. The day-to-day coordination of the project will be the responsibility of a 40% research assistant, a doctoral student at GSLIS, who will handle the on-site teaching of the curricula at our initial partner sites and the training of librarian leaders at subsequent sites. Pixo of Urbana will be serving as our tech consultants; they have prior experience with IMLS-funded projects, extensive familiarity with a multitude of app-building platforms, and a keen interest in youth engagement.

We have strong relationships with our colleagues at our four core partner institutions: Judy Wiegand, Superintendent at Champaign County (IL) Unit 4 Schools; Amanda Raklovits, children's librarian at Douglass Branch Library, one of the Champaign Public Libraries; Janet Vogel, youth services coordinator for the Frederick County Public Libraries in Frederick, MD; and Emily David, Associate Manager of Youth and Adult Services at the Springfield Public Library, Springfield, OR; these partners will be part of our planning phase in year one as well as our programming in years two and three, and they will therefore serve as our de facto advisory committee as well. The research assistant will be responsible for ongoing communication between GSLIS and the site libraries.

*Time:* The project grant will run from October 1, 2015 to September 31, 2018. Year one, 2015-2016, will involve regular discussion with the core partners and grant personnel to result in curricula implemented at Champaign School District in spring of 2016 and Douglass Branch Library in summer of 2016. Year two, 2016-2017, will involve refinement of those curricula and their repetition, with the addition of implementation at the Frederick County Public Libraries and the Springfield Public Library in summer of 2017. Additionally, year two will involve the identification of two to five additional sites for participation in year three. Year three will expand the curriculum implementation to those new sites as well as the prior four sites, at school libraries in spring 2018 and at public libraries in summer 2018. Year three will also involve the communication of our work at conferences and in journals as well as the broader online dissemination of the curriculum to interested librarians.

*Budget:*
We request funding to cover the following personnel costs:

- 10% of Susan Lafferty's time to serve as project manager ($18,926)

- 5% of a communications staffer's time to serve as communications coordinator ($[redacted])
- 40% time doctoral student research assistant to function as day-to-day project coordinator ($[redacted])
- A three-year contract with Pixo, our technical consultants ($[redacted])

We seek funding for the following fringe benefit costs:

- Benefits at [redacted]% for 10% project manager time and 5% communications coordinator ($[redacted])
- Benefits at 6.19% for one doctoral research assistant ($[redacted])

We seek funding for IMLS travel ($6,000) and other travel ($10,500)

We request funding for printing ($600)

We request funding for app creation tools ($2,000)

We request funding for the tuition remission expenses at 64% for the doctoral research assistant ($[redacted])

The University of Illinois charges indirect costs of [redacted]% on all direct costs except GRA tuition ($[redacted])

Total funds requested: $248,205

**Communications plan:**

We will draw on the services of one of the GSLIS communications office staff to handle our ongoing communication needs. A dedicated website for the project will share goals, progress, and findings; we will also circulate news and information through social media, both via the GSLIS communications feed and the Center for Children's Books outlets. The University of Illinois is currently home to several different projects involving youth and technology, and we seek to establish ongoing cross-field conversations with the other leaders in this area on-campus as well as nationally. Additionally, we anticipate that our partner sites will wish to communicate their progress and successes with their constituencies, and we will support and assist with such communications, as well as coordinating more centralized efforts to create updates on social media and press releases. For the purposes of identifying our new sites for our expanded third-year program, we will reach out to libraries and schools via the web and social media, and through the flourishing library listservs such as LM_NET and PUBYAC.

As we did with our planning grant, *Closing the App Gap*, we will take part in the ongoing professional conversation about youth and technology; during the implementation phases (years two and three) we will participate in national library conferences such as ALA and ASIS&T and regional/state conferences such as ILA and ISLMA; we also plan to expand our communication more directly to the

educational field with conferences such as AECT (Association For Educational Communications and Technology), and ASCD (Association for Supervision and Curriculum Development), and ICE (Illinois Computing Educators). We will also support and coordinate with our partner sites in local, regional, and national presentations about their work.

**Sustainability:**

Our sustainability model will hinge on our curriculum design. Our App Authors curriculum will be easily adapted to both school and public libraries with a variety of technical competencies and resources. Such a design will be cost-effective for sites that have the technologies available, and so one of our goals is to use the multi-site collaboration to help make this work for different kinds of local technological arrangements with the least possible cost. In addition to the transferability of our curriculum design, we will conclude with a collection of the apps that young app authors have created; young designers, app testers, teachers, and parents will be able to share the participants' apps via a centralized digital repository that allows for free downloading.

## References

Code.org. (2012). "Computer Science: America's Untapped Opportunity." Retrieved from http://code.org/stats

Hoffman, M. (n.d.). "Computer Science for Minorities." Computer Science Online. Retrieved from http://www.computerscienceonline.org/cs-programs-for-minorities/

Koerner, B. (2013). "Forget foreign languages—teach our kids to code." *Wired.* Retrieved from http://www.wired.com/2013/09/ap_code/

Margolis, J., Estrella, R., Goode, J., Holme, J. J., & Nao, K. (2008). *Stuck in the Shallow End: Education, Race and Computing.* Cambridge: MIT Press.

National Science Foundation. Digest 2015. Retrieved from http://www.nsf.gov/statistics/2015/nsf15311/digest/

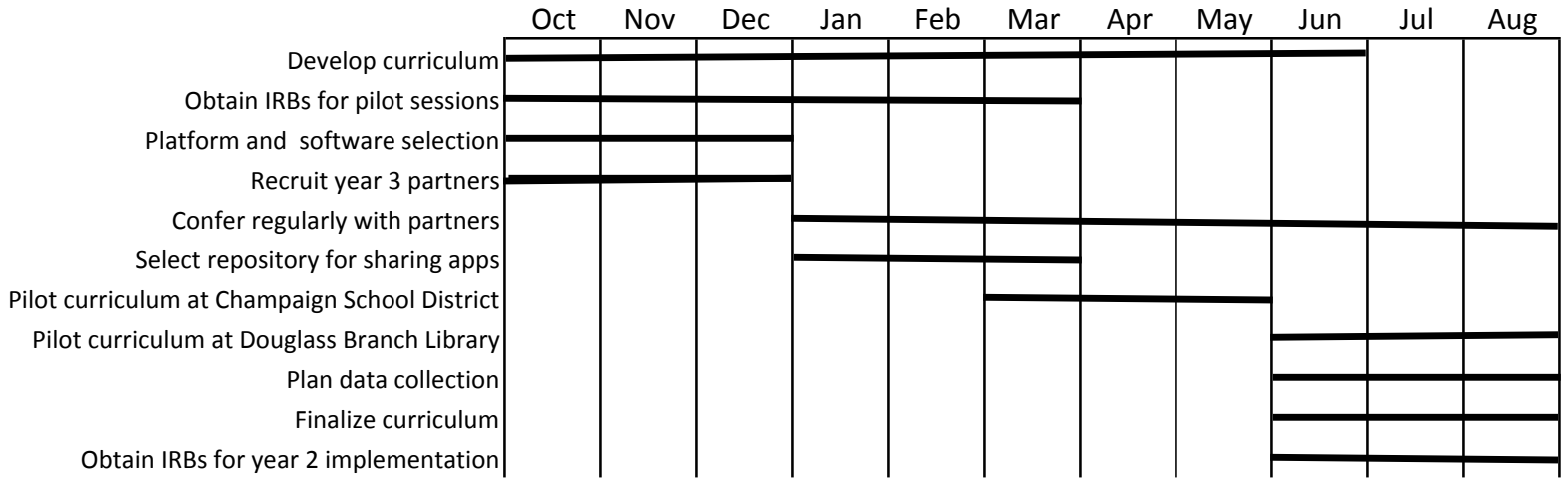
Pearson. (2014). "New Study Reveals U.S. Students Believe Tablets Are Game Changers in Learning and Student Engagement." Retrieved from http://www.pearsoned.com/news/new-study-reveals-u-s-students-believe-tablets-are-game-changers-in-learning-and-student-engagement/

Subramaniam, Mega M.; Ahn, June; Fleischmann, Kenneth R.; Druin, Allison. (2012.) "Reimagining the Role of School Libraries in STEM Education: Creating Hybrid Spaces for Exploration." *Library Quarterly*, v82 n2 p161-182 Apr 2012.

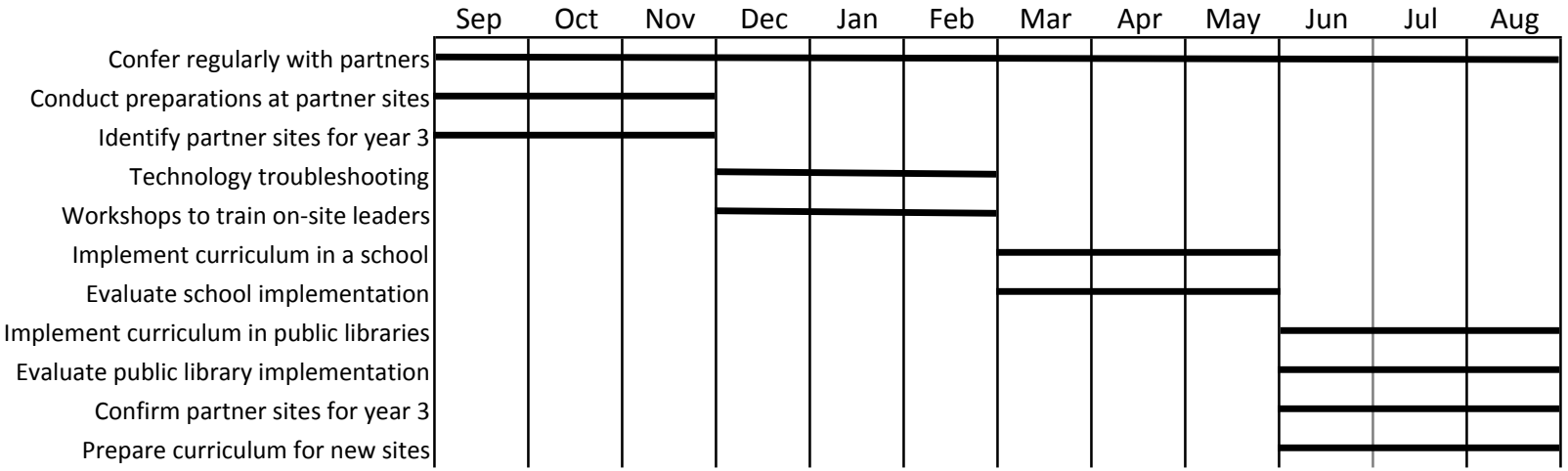
Ryoo, J.J., Margolis, J., Lee, C.H., Sandoval, C.D.M., & Goode, J. (2013). "Democratizing computer science knowledge: transforming the face of computer science through public high school education." *Learning, Media, and Technology*.

The White House, Office of the Press Secretary. (2009). "President Obama Launches 'Educate to Innovate' Campaign for Excellence in Science, Technology, Engineering & Math (Stem) Education." Retrieved from https://www.whitehouse.gov/the-press-office/president-obama-launches-educate-innovate-campaign-excellence-science-technology-en

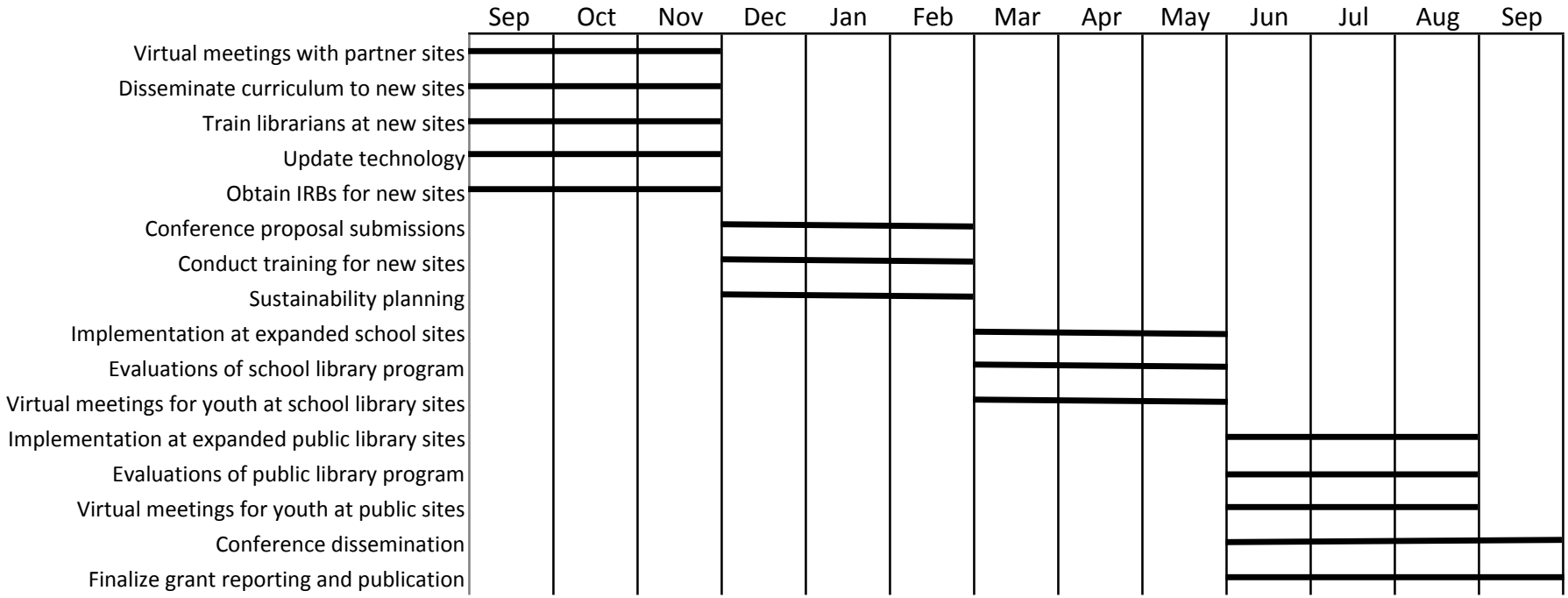
**Schedule of Completion: Year 1 (2015-2016)**




**Schedule of Completion: Year 2 (2016-2017)**



**Schedule of Completion: Year 3 (2017-2018)**



# ORIGINAL PRELIMINARY PROPOSAL

*App Authors: Closing the App Gap II*

**Overview**

*App Authors: Closing the App Gap II* is a three-year project that will be led by Dr. Deborah Stevenson, Director of the Center for Children's Books, with co-PI Dr. Kate McDowell, Associate Professor, both at the Graduate School of Library and Information Science at the University of Illinois Urbana Champaign. The proposal is being submitted under the Project category, and it addresses the focus area of Learning Spaces in Libraries. The project's goal is the creation of a curriculum, workshops, and tools for use in school and public libraries that will teach young people to create apps and allow them to share their achievements with other children; such protocols further establish the place of libraries as a community center for youth in the area of STEM exploration and digital development.

**Background**

Our previous IMLS-funded grant, *Closing the App Gap I: From Plan to Project,* was a planning grant that served as proof of concept, demonstrating that there is a need for access to apps in libraries that serve historically underserved populations. From program attendance and enthusiasm, it was clear that we had identified a significant need for children from lower-income neighborhoods, who were engaged and excited by the novelty of tablet computing. Our pilot program drew nearly 100 children over the summer, many of them repeat attendees, who greeted new apps with fist-pumping enthusiasm and leapt to high-five adults and one another at their achievements.

**Statement of Need**

We learned from our work on that grant that, like the #weneeddiversebooks campaign, we as professional librarians also need diverse apps, and that apps featuring people of color were extremely hard to find; we also felt that the interest of our young patrons in apps and connecting with one another over them indicated a need for deeper engagement with computing and creation as well as use. With STEM education a current national priority, libraries play a vital role in creating STEM learning spaces for young people, especially those young people who have limited access to technology at home.

**Impact**

With the App Authors project, we propose to address several of those needs. The project will:

1. Provide librarians in public and school libraries with tools to help them teach children computational literacy through app design.
2. Empower young people to represent themselves in apps.
3. Allow for valuable mentoring and peer experience as young people work with one another and share their creations with young audiences.

The project team will develop a curriculum and program plan to be piloted in at least three public institutions serving youth, including both school libraries and

public libraries, with plans for subsequent for multi-site implementation within their systems or units. We will then expand from our core partners to launch programming at additional sites, chosen for breadth of dissemination. By the completion of our project, we will have involved youth in multiple systems and at multiple sites across the country, have established the value of app-creation programming and libraries as a site for such STEM-related growth, and created and shared programming curricula to allow schools and libraries to replicate and adapt our programs for their own use. The results will be shared widely through conferences, publications, and online seminars designed to reach a third group of youth services librarians, who can further disseminate the curriculum and program plan.

**Project Design**

In Year One, the core staff at the Center for Children's Books will work in consultation with project partners to develop an **app-building curriculum**. We have three partners committed to participation in the pilot programs. Janet Vogel, Youth Services Coordinator for Frederick County Public Libraries in Frederick, MD oversees eight library branches. At their central branch, they have a new STEM lab focused on early childhood audiences, which has served over 2000 young people since June 2014. Dr. Judy Wiegand, Superintendent of Champaign, IL Unit 4 School District, has agreed to pilot our curriculum through the digital literacy program at Kenwood Elementary School, and disseminate the curriculum through their STEM coordinators, allowing for cross-district implementation in a district serving 9600 students. Emily David, winner of REFORMA's Mora Award, Associate Manager of Youth and Adult Services and former Latino Liaison at the Springfield Public Library, Springfield, OR (a library that serves a population with a significant Latino component and a high number of low-income residents), has committed to representing the western U.S. We continue to receive inquiries from possible additional partners, and we are also in conversation with corporate donors about possible sponsorships of technology and software that would allow libraries with greater need to participate.

In Year Two, the core partners will conduct a series of **pilot programs** at their school or public library. The project team will assess these programs and develop curricular plans and materials based on participant feedback and experience during program sessions. In Year Three, the project team will expand the reach of the program through **app-building programs** with the core partners and with new partners, and will provide guidance for other interested professionals through conference presentations and online workshops.

**Budget**

The project team anticipates a direct funding request for $250,000. Funds will cover personnel time for curriculum and program development and project management; travel funding for site visits; supplies to support outreach; and conference travel to share our findings and disseminate our curriculum.