

School Library Makerspaces in Action

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SCHOOL LIBRARY MAKERSPACES IN ACTION

Heather Moorefield-Lang, Editor



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Foreword

In Chicago after the great fire of 1871, amid new technologies like the electric elevator and plummeting steel prices, a set of architects rethought the city skyline. They had no kits, no prefab instructions. Instead they mixed design influences, new construction tools, and a resurgent local interest in Chicago to build skyscrapers. What they intended as a bold melding of pragmatism and idealistic vision ended up changing society. The skyscraper, along with the advent of reliable phone systems, allowed corporations to grow larger and to coordinate global enterprises under a single, albeit lofty roof. This created a new urbanism that shifted populations from the countryside to the city.

What is remarkable about this process is that it began with a change in thinking. Old norms of how things had to be done were thrown out. New relationships of like-minded artisans and engineers came together and realized they could create, not simply implement.

The analogy may seem to be clear to the world of making and maker spaces. However, that is a secondary application. The primary one is that it took a corps of dedicated facilitators who helped weave a new view and new thinking. In Chicago there were students, demonstrations, tours, workshops. In our schools, with classroom teachers increasingly scheduled and curriculum shaped by high-stakes testing, school librarians have an opportunity to create spaces of experimentation, design, and new thinking.

This is not a new mission for school librarians. They have always nurtured makers—makers of new ideas and new narratives. They have always sought to supplement curriculum with inquiry—to amplify imagination and instill a sense of power that fuses math, science, history, and language into new realities. They have done this without a kit, a blueprint, or a predefined path but always with purpose.

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This book, then, is more about you, the school librarian, than the spaces you build or the students you inspire. You are the makers.

Dr. David Lankes

*Director, School of Library and Information Science
University of South Carolina, Columbia*

Introduction

WHAT IS THIS BOOK ABOUT?

In one word, this book is about makerspaces, but, truly, that is too simple; a robust selection of books are already available on that topic. Overall, this book is about makerspaces in school libraries and in school library partnerships. To delve deeper, this book is based on case studies of maker learning spaces in school libraries (and a few public libraries), looking at maker librarians and how they are effectively implementing maker activities, creativity, and collaboration in their library spaces. Libraries have always been a location for the creation of knowledge. They have always been a place to build, create, and collaborate. Adding in the idea of a space for making is a natural one for libraries and librarians (Willingham and de Boer, 2015).

The content of this book is organized into four parts: Early Grades, Middle Grades, Upper Grades, concluding with Collaborations, Training, and More. I describe each chapter as a case study because you as the reader are getting a glimpse into the educational practice of a particular person or group.

#MakerMonday: Inspiring Students to Think with Their Hands, by Stacy Brown, takes us through the process of creating a makingspace using hi-tech and low-tech resources. Stacy Hammer's chapter, *Wide Open Spaces: Creating a Library Makerspace in an Open School*, discusses the maker movement in libraries particularly at the elementary or lower grade levels. IdaMae Craddock, in her chapter *Makers Gonna Make*, discusses a library's journey from traditional maker, while Jennifer Tazerouti takes us through her own journey of maker discovery in her chapter, *A Makerspace Journey of the Middle and Elementary Kind*. Sarah Justice talks about how technology implementation in her school led to the creation of a makerspace in her library in *The Makerspace Evolution*. Phil Goerner and Lucas Maxwell both discuss student-driven

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makerspaces in their chapters *Student-Led Makerspaces* and *Letting Students Lead the Makerspace*. Gina Seymour takes us on a journey of inclusiveness in her chapter *The Inclusive Makerspace: Working with English Language Learners and Special Education Students*. The book wraps up with chapters on training and collaborations. Laura Fleming shares ideas for maker training in her chapter *Maker Professional Learning for Educators*. Jeroen de Boer, Roxanne Spray and Melissa Crenshaw write about their public library and school library partnerships in *Impact through Connection at School: Public Libraries Creating Impact by Bringing Digital Literacies and Maker Skills into the Classroom* as well as *Shared Spaces and Makerspaces: A Public Library and School Library Partnership*.

Every chapter in *School Library Makerspaces in Action* offers real-life case studies in how making happens in libraries and educational settings from the experiences of the authors. Useful ideas abound, and it is hoped that readers will walk away with a wide range of ideas for their learning location.

MAKERSPACES AND SCHOOL LIBRARIES

Making as a culture has grown in popularity particularly in libraries over the past five years. Spaces to make, or “makerspaces,” are locations to create, build, craft, collaborate, and explore. Children, adults, and families have been very excited to take part in the maker learning locations offered at libraries, museums, and other environments of instruction over the past few years (Halverson and Sheridan, 2014). Laura Fleming defines a makerspace as, “A metaphor for a unique learning environment that encourages tinkering, play, and open-ended exploration for all” (Fleming, 2016, para. 2). These are locations, sometimes fixed, sometimes mobile, that have the ability to add a wonderful learning experience in a library and other educational settings.

When we look at Bloom’s Taxonomy, we in a library are already working at the levels of remembering and understanding various topics and information. We as librarians are also adept at instruction in analyzing and evaluating information, especially when we are working with our students on their information literacy skills. What about the top of the Bloom’s Pyramid? What about creation (Bieraugel and Neill, 2017)? In libraries we can reach that goal with projects and peer educator collaboration, but think of what can be achieved with making, creation, and maker learning spaces. Think about the group work, the research projects, and integration that can occur, as well as the critical thinking that can be achieved. Surely something to ponder as you make your way through this book.

AUDIENCE

I envision the readers of this book to be school librarians, classroom teachers, preservice librarians, professors of library science, as well as librarians in other fields such as academic and public. In actuality, this book is for anyone looking to find ideas and concepts in the area of making, makerspaces, hackerspaces, fab labs, and DIY locations and how they might be used in libraries

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and education. We have authors from around the world represented in this book, and we hope to address the needs of international readers as well. Every chapter written for this book had a specific audience in mind because the authors worked with a certain population. We know though that, with only a little fine-tuning and imagination, many of these ideas could be used throughout all levels, disciplines, and subjects in K–12 education and could carry over into higher education as well. This book was written for the express purpose of generating and sharing ideas, as well as to optimistically inspire our readers to think about maker learning locations and their potential uses in libraries and classrooms.

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Impact through Connection at School: Public Libraries Creating Impact by Bringing Digital Literacies and Maker Skills into the Classroom

Jeroen de Boer

INTRODUCTION

During the spring of 2017, Library Service Friesland (Bibliotheekservice Friesland, or BSF) initiated the project *Impact through Connection at School*, together with Maker Households, a private company led by Ton Zijlstra. This project, a pilot project under the new media literacy policy of the National Library of the Netherlands, took place at an elementary school, the Dr. Algra-school, in Leeuwarden (Coenders, 2016). Other partners were Leeuwarden Public Library (SBMF) and the NHL University for Applied Sciences (NHL).

The experiment centered around helping the group to identify communal issues and situations they would like to change and then to develop ideas and realize them. So that the group “gets” that with various making and other types of machines and instruments, they have the agency and the power to change their surroundings for themselves as a group.

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From January 2017 until March 2017, the project team met with the school's team, and then weekly six times with the class of 22 children, aged 10–11. It was loads of fun, and not just for the kids involved. The highest compliment we received was that one of them said, "This is more fun than the annual school trip." Another remarked feeling sorry that all other classes had to work, while they were inventing ideas and making stuff. We pointed out that they too were working very hard but differently and that having fun does not mean you're not working.

AGENCY

Agency, in the definition of Professor Marc Coenders, is:

an ability to work with others in order to expand the solution space by identifying and providing access to resources that others can contribute to when they analyze problems and formulate answers (Coenders, 2016).

Ton Zijlstra sees agency "as a way to succeed in lowering the adoption threshold for existing technologies and techniques. Then any group can recombine those technologies and techniques to create a desired impact in their own contexts and environment" (Zijlstra, 2017). In that sense, it is a working method to get a community on the move, using cheap technologies and open network principles. It seems to apply to library labs in an apt way. It is not restricted to a formal situation, though, but is rather well applicable to the informal nature of library activities. At the same time, it does not mean it is only about play. The pursuit of impact coincides strikingly with the principle of library as a platform, aiming at knowledge development in local communities. However, demands on librarians to guide this process or to help find partners here are high.

The framework that we used has been developed by Zijlstra. The main question we wanted to answer was the following: *How do children adopt new developments and technologies as easily as possible in order to achieve local impact?* The principle is that by using inexpensive technologies and appropriate working methods, the action perspective of children is enhanced. It allows them to have control over the technologies and meaningfully deploy those for themselves and their school or neighborhood.

However, it is not always the case that these technologies are close to the students. In that sense, there is a (digital) literacy gap to bridge. We wanted the pupils to identify a local situation where there is a need and how they can use open technologies and a suited working method to create impact. The starting point is that the tools used are so cheap that they will never hinder the process.

ABOUT FRYSKLAB AND DIGITAL LITERACIES

FryskLab's educational offering seeks to contribute to stimulating the development of digital literacy. In this field, different frameworks exist, but we

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deliberately chose the approach of Doug Belshaw. He assumes that someone is not just digitally literate because the concept in his view consists of several elements, eight in total. He says:

It is easy to paint a utopian picture of what can happen when learners connect to information and to one another via digital tools. There's plenty of rhetoric about learning and jobs being available to all through the internet. What is often missing is the recognition of the multiple literacies needed to not only turn desire into action, but even to know what is obtainable (Belshaw, n.d., p. 39).

According to Belshaw, the degree of literacy is dependent on the extent wherein users can remix different literacies (he deliberately used the plural form). They also depend on the context in which they are used. In his book, he illustrates this with a trivial example of an 11-year-old being able to draw a graph when sitting in a mathematics classroom—but not straight afterward in his history classroom (Belshaw is a former history teacher).

Although Belshaw does not specifically link digital literacies with librarianship or maker education, this connection is made by Swedish librarian Åke Nygren (2014), working at Stockholm public library. He devised a way to associate Belshaw's theory with librarianship. Nygren put together eight maker boxes, each one having a link with one of Belshaw's literacies. Each box consists of a piece of open technology (for instance a Raspberry Pi, wearables, a 3D printing pen, or a link to Mozilla software), but it does not come with a manual. During so-called Maker Parties (conducted in 2016), a concept developed by Mozilla, librarians have to find out how the content of the boxes works and, most important, how they link to the different literacies and how all this connects to modern-day librarianship. Learning by doing in its purest form.

ROLE OF THE LOCAL LIBRARY AND LIBRARIANS

The backbone of the project is the objective that the local libraries and librarians facilitate this process from beginning to end. This means the project approach is extremely intensive. It is important that it is not about an individual action perspective or just that of a whole group but that the action perspective of individuals is embedded in a group or social context: How do I strengthen my school and, by that, myself?

In that sense, it fits very well with the task that Leeuwarden Public Library must fulfill in the next couple of years: Because of a decreased number of local branches in the neighborhood, the library should manifest itself by means of so-called *connection points*. This process is ongoing at this moment, and the Agency method could possibly serve as a fitting approach not only in a school setting but also on a neighborhood level and with other focus groups. In the spring of 2017, we want to test this idea with a group of adults in the same area as the school, in a project that will also be funded by the National Library of the Netherlands, as part of their innovation program.

The desired outcome of both projects is twofold. First, it hopefully leads to a process that results in a solution and thus impacts the participants involved. For us, this redefines the role of the library, beautifully written down by David

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Lankes: “We too often have accepted the role of libraries as an answer to access instead of an agent of impact” (Lankes, 2017).

In both cases, we also will provide a toolkit that captures the process systematically, so that it can also be used at other schools or neighborhood settings. This toolkit will become available for free for all Dutch public libraries.

JANUARY–MARCH 2017: WORKING IN SCHOOL

We visited the Dr. Algraschool six times. During these sessions, we went through the schedule of the Agency Map:

Session 1 (January 25): A group discussion about the children’s environment, things they would like to change, ideas for making things they had. This resulted in a physical “wall of ideas” in the classroom, ordered from “looks less hard to do” to “looks harder to do.” We also discussed the idea of robotics with the children and showed them a potential example of an 11-year-old boy who needed a prosthesis for his hand and who chose the e-NABLE prosthesis (2017), mainly because it was cool and could be printed in the colors of his favorite soccer team, Bayern München. This really resonated with the pupils and ignited a discussion about fairness and the way money “works”: Why are some prostheses so expensive if you can also have one for a fraction of the costs?

Session 2 (February 1): Getting to know maker machines (3D printers, laser cutter, electronics, etc.) by bringing the machines into the classroom and parking the FryskLab mobile FabLab out front. Children were taught how to work with Tinkercad, an online 3D modeling platform to create 3D designs. They were also able to experiment with littleBits, an open source library of modular electronics that snap together with small magnets for prototyping and learning. This gave them an idea on how to get started with their own ideas.

Session 3 (February 8): Getting to know programming by using micro:bit, the microcontroller invented by the BBC in 2015, which is becoming available in the Netherlands and Iceland in 2017. All the children got one to keep personally as well. Some pupils who already had some coding experience, for instance with Minecraft or Scratch, were quickly becoming coaches for the other kids.

Session 4 (February 15): Diving deeper into the idea now that they have a notion of what is possible with the machines and material available, using a canvas to think about what the idea solves, whom it is for, what part of the idea to zoom in on, and who in their own social network could help them realize the problem.

Session 5 (March 8): Building prototypes, again with the FryskLab truck parked outside. We also put together a group of pupils who became the project’s journalists. They got to know WordPress and learned how to use tablets to make videos and take pictures to include in their online journal.

Session 6 (March 13): Building prototypes and presenting results to each other. Some of the finalized projects included plelexible phone covers for phone types that aren’t otherwise available, a way to look under water, an Arduino-powered classroom MP3 player for audiobooks, games, computer-controlled door locks, a candy machine, a robot to counteract bullying, Web sites documenting the process, and a money system for the school.

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The team responsible for supervising was different each session. Because we could not foresee what would be expected, the team needed to be flexible in the next session. In this sense, we really felt like librarians: taking note of what the pupils needed and trying to find a solution.

GENERATING AND SELECTING THE IDEAS

Generating ideas by the pupils marked the beginning of the project. In a two-hour session with the pupils, each of them was provided with a set of sticky notes to patch their ideas on. Those were then put up on a wall in the classroom (and stayed there for the entire project): a wall of ideas.

The ideas were arranged by the level of feasibility, from easy to hard. It soon turned out that the pupils in thinking about their wishes, coupled with technology, rapidly narrowed this down to making robots. The idea of what a robot is was directly linked to a humanoid figure, which is useful or fun for you: a cleaning robot, a cuddling robot, or a cleanup robot. We quickly had to tell them that the realization of such a robot would not be feasible, at least in this project.

Ton Zijlstra said:

When we look at making, we see how it is different from what was before, how all of a sudden “anyone” can do things that took specialized machines and factories earlier, and how that changes the dynamics of it all. The children don’t see it that way, because they don’t have that history. Although that history is the source of our own fascination it is not the fascination you can confer to the children, as it is by definition a meaningless comparison to them (Zijlstra, 2017, para. 20).

We also didn’t succeed in our original plan to bring the group to defining one or a few projects that were less person focused and more group focused (except for the kid that designed a currency system for the school) and then selecting parts of them on which individuals or small groups could work. It seems we would need to spend more effort in the run-up to the cycle of sessions to do that properly. We also got this feedback from the group teacher, Annarein Dijkhuis. After the project, she said:

In the beginning I found it hard to define the substantive purpose and ultimate goal of the project. I felt involved, but on the days itself I wasn’t able to help the pupils, because my knowledge about programming or a question about the steps to take to arrive at a final product wasn’t sufficient.

However, we gathered some wonderful ideas from the pupils: a device to see underwater (thought up by two classroom friends who shared a love for fishing), flexible cases for obscure cell phones, and a device that automatically turns the pages of a book. Also an idea that did not require a technical solution: a private money system for the school. This last idea resulted from a discussion with the children about value and fairness and about the open source prosthesis: How do money and a money system actually work? Another

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question that arose: Why shouldn't any kid who needs a prosthesis have access to a reliable and cool aid?

GETTING FAMILIAR WITH THE POSSIBILITIES OF MAKING AND CODING

We used two sessions to let the kids get acquainted with low-cost technology. In the first session, they went to work with 3D designing and 3D printing. For this, we used the FryskLab truck, and we also set up an instant maker space in the classroom. In the truck, they also encountered the laser cutter, as well as equipment such as littleBits. The design task consisted of designing something that was related to the ideas they came up with earlier.

In the second session, students worked with micro:bit. The students received their own copies that they could keep well. Using micro:bit, most of the children took their first steps in programming.

Pupils who already had some programming experience quickly turned out to be coaches for the other kids. After this session, we sat down with the classroom teacher, Annarein Dijkhuis, and the school principal, Cees Joossen, in which Annarein pointed out: "You really touch some kids. It is like opening the world for them. Teaching computer programming? Another thing to do! But when I see what is happening, I see why it is so important." Two months later, she would say, answering a question about digital literacies in her school:

We are well aware of the fact that digital literacy should play a more prominent role in our school. At this moment it is not clear how this should be implemented though. Groups 7 and 8 [10- to 12-year-olds] do participate in the Week of Media Literacy each year. And a short while ago some teachers went to an information meeting about programming in the classroom. We are certainly aware that there is something to be done.

BACK TO THE IDEAS: WHAT IS POSSIBLE, AND WHAT CAN YOU DO YOURSELVES?

After these two technology sessions, we spent a lesson to reflect on the ideas from the first session. It was important to further define their challenge. They were also asked to think about what would be needed to achieve this. For this, they had to answer some questions. They were also asked to visualize the idea. This was all brought together on one canvas. The questions to be answered were as follows:

1. What do I wish to solve, what do I want to change?
2. To which groups do I belong?
3. For whom do I want to do something? Draw that person.
4. What does this person need?
5. What can I make myself?
6. Who would you like to help you? Think of the groups you mentioned in question 2!

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The team used these canvases as a basis to determine what the follow-up would look like. Therefore, a shared Google Drive spreadsheet was used, to which the canvases were uploaded. In this spreadsheet, the team members would assign themselves to a number of projects. It was also identified which materials and knowledge sources would be used. Given the diversity of 11 projects, this preparation was really necessary. For example, for the idea of the school money system, we decided to approach an economics teacher. He would talk with Anna, the girl who came up with the idea, about money systems and what is necessary to make them work.

As an example of the canvas results, here are the results from the project *De Onderwaterkijker* (The Underwater Viewer), an idea from best friends and fishing buddies Jesse and Ezra:

1. What do I wish to solve, what do I want to change?
Less pollution in nature. Less waste in the water, such as branches, pouches, and cans.
2. To which groups do I belong?
Soccer team, family, school, drumming, fishing team Jesse and Ezra
3. For whom do I want to do something? Draw that person.
4. What does this person need?
An Underwater Viewer
5. What can I make myself?
The device to watch under water with
6. Who would you like to help you? Think of the groups you mentioned in question 2!
Team members Jeroen and Dragan, our class, and ourselves.

MAKING, MAKING, MAKING

The last two sessions were used to let the students actually create their ideas. The evening before the first session, a number of details were discussed with teacher Annarein. She said some pupils were a bit hesitant about the upcoming sessions. Due to illness or other reasons, they did not have an idea to build upon or simply felt a lack of ownership regarding the project they were working on. So we suggested that maybe those students should take up the role of journalist. This would mean that they learned how to use a CMS (Word-Press) and to work with tablets as a means to gather information. The teacher responded enthusiastically, so we told the class the next day that there still was an important but not yet completed project. When asked who wanted to be a journalist, about six students responded. In this way, a component that initially was not part of the program thus proved a popular addition. In a possible follow-up, it will therefore be a fixed element.

Regarding the project ideas, some children had to accept that we could not realize theirs. In one case, the reason was that the idea was too complex (for instance, a device that automatically expresses thoughts by visualizing them). In another case, it would be technically feasible, but it did not fit within the available time and resources (the Anti-Pestomaat, or Anti Bullying Machine, a

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device that confronts anyone who bullies with their behavior). In both cases, the children had to jump a hurdle and start with another project. That worked in both cases. In the first case, the idea owner created an Arduino MP3 player for classroom use. In the other one, the pupil devoted herself to the role of journalist.

In the end, a total of 11 projects were taken on by the pupils and the FryskLab team. Almost all of them were realized.

ABOUT THE ROLE OF THE LIBRARY

After completion of the project, both pupils and teacher were asked about the role of the library in the project. For the children, the question was, “What do you think about FryskLab being a project of the library?” Most kids answered they really liked it, but some also found it a little weird. One pupil put it this way: “I find it is very good of the library, because they are doing something different, and everybody likes that.” Another student commented, “I think it is a bit weird, because books and programming and 3D printers don’t have anything to do with each other.”

The teacher answered two questions, the first one being: “Impact by Connection at School is a project of the library. What do you think of the development that libraries deal with these issues? Her answer was:

I find it extremely valuable for society that the library is becoming much broader than just focusing on motivating people to start reading. The library can reach a large group of people of all ages and is easy accessible for many of them. The library raises questions about social issues and connects different knowledge resources to serve specific audiences.

Answering a follow-up question about whether this fitted her personal image of the library, she responded: “I knew that the library was on this course, but for many of my colleagues it came as a surprise that this was an organized project from the library.”

LOOKING BACK AT THE PROCESS

In general, we didn’t succeed in our original plan to bring the group to defining one or a few projects that were less person focused and more group focused (except for Anna, who designed the school currency system) and then selecting parts of them on which individuals or small groups could work. The process worked in the sense that we got everyone to make things and to dive deep beyond the initial magic and “Wow!” of 3D printing and laser cutters.

The realization for the children that things take time can be complicated—that it is not magic but actual hard work. Some children literally translated it by saying that waiting for a 3D print took very long. Other children could grasp very well that persistence takes time but eventually can take you anywhere. For example, Anne, the student who worked on the school money system,

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learned that “all is possible and that if you want to make something you really can.” When asked what she was doing differently now than before, she replied: “Believing in myself and that if I want to make something, it is always possible.” Asked what made it so much fun, she said: “I liked planning my idea a lot. It made it fun, because you can know everything yourself. The idea is all yours. There are no things that are not allowed”.

The principle of cooperation, one of the goals of the project, showed itself as something that the children recognized and was perceived as an added value. One of the questions we asked the kids afterward was: “Were there things that you found difficult to do? What did you do then?” The response of Jesse, one of the two pupils working on The Underwater Viewer, was: “Think of an idea. But when accompanied with Ezra we thought very hard together and then we came to a conclusion.” His answer to the question “What did you dislike or less fun? Why?” was: “I didn’t really like to think about ideas, because it was only thinking and not doing, but it had to happen.” Eventually, however, he saw that it was important, responding to the question “What did you learn?”: “That it’s hard to think of something and that you must first have a plan before you start something.”

When we sent classroom teacher Annarein a survey after the project, she also noticed pupils started to act differently:

Normally the emphasis in the classroom is especially on reading, language, spelling and math. Not everyone excels in those and I especially saw children excel who not very strong in the above fields. They simply flourished in working with their hands, using creativity, practical insight and considering programming. What I found very nice was to see all students starting at the same level. It was new and challenging for all of them. The “rank”, because they know exactly who are weak or strong in learning in the classroom, did not count now. Both strong and weak students found each other in terms of ideas, design and implementation, for instance in the case of the water telescope. Everyone starts at zero. The competences that stood out and which I still see in my pupils are problem solving . . . thinking in small steps . . . see[ing] what is the right order to get results. Nothing is impossible! Also showing perseverance to be able to sort out a problem and wanting to solve it. And communicating and working together to reach a solution.

We learned a lot about doing this project, which was really a pilot. Already pointed out is the fact that the process of really thinking about something and making it takes time. Yes, it is possible to build a robot that does things for you, but it takes a lot of steps in doing so. In that sense, it’s also important for us to realize that, for this age group, software is often equated to computers and phones, that it is possible to program things that don’t look like computers, and that hard- and software are getting merged more and more (cars, IoT, robots).

Likewise making is mostly connected to hardware, objects, and software. Creating “systems” or “processes” is a novel concept, except for the currency making project. Ton Zijlstra: “*For the pupils challenging systems is like a fish changing the water it swims in*” (Zijlstra, 2017). Similarly for most of the children, their actual environment (the street, the neighborhood, the city, etc.) is also like “water” and was mostly perceived as immutable. Or the ideas were

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far too gigantic to realize (for instance, building large bridges to make commuting to school faster). Measuring things in your environment and acting on those measurements were notably absent in the ideas.

NEXT STEPS

During the project, the school already indicated that it pays too little attention to digital literacy. They do have ambitions, though. That the library could play a role in reaching their ambitions was initially unknown. Thanks to the project, this idea has changed. The school would like to scale up the project, so that other schools in their school association will be able work with it as well. Looking forward we will consider whether this is possible. Among other things, ideally the conduct of research on digital literacy would be part of it.

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About the Editor and Contributors

EDITOR

HEATHER MOOREFIELD-LANG serves as associate professor at the University of South Carolina in the School of Library and Information Science. Her research is focused in emerging technologies and their use in education and libraries. Heather is interested in how technologies can further enhance instruction. Her current research focuses on makerspaces in libraries of all types and levels. She has had the honor of being nominated for the White House Champion of Change for Making in 2016. To learn more, see her Web site www.techfifteen.com, visit her YouTube Channel Tech 15, or follow her on Twitter @actinginthelib.

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STACY BROWN is the 21st Century Learning Coordinator at The Davis Academy in Atlanta, Georgia, where she manages two media centers in a kindergarten prep through eighth grade academic environment. Recognized for facilitating the integration of technology into the curriculum, she leads #MakerMonday for kindergarten prep through fifth grade, teaches a fourth-grade programming and robotics class, developed a fifth-grade entrepreneurship and technology course, and leads teachers' professional development in the area of technology integration. Stacy earned her master's in library and information sciences from Florida State University and her bachelor of arts in English with a minor in French from The University of Texas at Austin. She currently serves on the board for both Atlanta Area Technology Educators and

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IDAMAE CRADDOCK, M.Ed, a 16-year veteran of Albemarle County, is the librarian at the Jackson P. Burley Middle School. Ms. Craddock has spoken at the White House, the Bay Area MakerFaire, MakerEd, and The South Carolina Association of School Libraries. Winner of the Magna Award from the National Association of School Boards, her publishing credits include *Library High-Tech*, *School Library Journal*, and *Knowledge Quest*. The focus of her research is Maker Education and the role of school libraries in the community. Her program has been profiled by *School Library Journal*, Library Media Connection, NPR, and Edutopia. She has a spirited daughter, an understanding husband, and a lazy dog named Peacha.

MELISSA CRENSHAW is a branch manager for the Ware Shoals Community Library. This is her tenth year at Ware Shoals Community Library. Melissa has created and orchestrated numerous community programs involving all age groups. Her focus is creating an enriching environment for her library for which the community can be more connected, informed, and entertained through free access to the resources and programs. Previously in her career, she worked in the school district for nine years, was a Girl Scout leader for ten years, and has written various articles. She has a wonderful husband and two beautiful daughters and has recently welcomed her first granddaughter.

JEROEN DE BOER works at Bibliotheekservice Fryslân (BSF, Leeuwarden, the Netherlands) as Innovation Advisor. He is a strong believer in open technologies and the way libraries can and should learn from maker culture. This is one of the main reasons why Jeroen served on the board of the FabLab Benelux Foundation for the last three years, first as secretary, later as chairman. One of the projects he currently works on is FryskLab, a Mobile Library FabLab (Europe's first).

He writes regularly on his personal blog and in professional magazines and gives presentations about libraries, innovation, and makerspaces at (international) library conferences. In 2015, Jeroen was nominated for Librarian of the Year in the Netherlands, in which he was awarded second best. He was also on the Europeana Task Force Public Libraries, focusing on library maker spaces in relation to the (re)-use of cultural heritage content. In his spare time, he is a music aficionado and an avid amateur cyclist.

PHIL GOERNER is the Instructional Librarian at Silver Creek High School in St Vrain Valley. His library, which won Colorado Library of the Year in 2012, is an active place with team teaching, presentations, poetry slams, book clubs, makerspace, and strong academic expectations. Phil is also a University of Colorado at Denver lecturer in the Library Sciences program. He loves technology and learning from his Personal Learning Network on Twitter @pgoerner. He

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constantly experiments with his makerspace students and loves collaboration, 21st-century skills, innovation, and his hobby of beekeeping!

LAURA FLEMING has been an educator in the state of New Jersey for 20 years. She has been both a classroom teacher and media specialist in grades K–8 and currently as a Library Media Specialist for grades 9–12. She has played a prominent role in education as a writer and speaker and has served as an educational consultant on next-generation teaching methods and tools. Laura cohosts the *Movers & Makers* Podcast and is the author of the best-selling *Worlds of Learning: Best Practices for Establishing a Makerspace for Your School* (Corwin, 2015). She is also the author of the soon to be released book, *The Kickstart Guide to Making GREAT Makerspaces* (Corwin, 2017).

STACY HAMMER is a second-year elementary school librarian at Battlefield Elementary School in Spotsylvania, Virginia. A Michigan native, she is a graduate of Wayne State University and the University of Michigan. Before earning a School Librarianship Endorsement from Longwood University, she taught middle school English. She loves children’s books, kayaking, her two dogs, and Vernor’s ginger ale. She lives in Fredericksburg, Virginia, with her husband and their two children.

SARAH JUSTICE is the media specialist at Rosman Middle and High Schools in Transylvania County, North Carolina. She was the 2016 North Carolina School Library Media Association Media Coordinator of the Year. Sarah has worked her way across the state of North Carolina in pursuit of her education. She received her undergrad from Appalachian State University, MLIS, from University of North Carolina Greensboro, and her MAEd IT from East Carolina University. Her passions include reading young adult literature and stalking authors—all to make her a better media specialist since she has to know what to recommend to the students, right? You can follow her adventures on Twitter at @sarahpjustice, Facebook @rosmanmedia, and Instagram @rosmanmedia.

LUCAS MAXWELL grew up in Nova Scotia, Canada, and worked as a fisherman, a door-to-door salesperson, a roof builder, and a stand-up comic before finally settling on being a professional librarian. He worked with teens in the public library for five years and then moved with his family to the UK, where he is currently working as a high school librarian in south London. He is a regular contributor for the Book Riot Web site and can be found on Twitter @lucasjmaxwell.

GINA SEYMOUR is the library media specialist at Islip High School, New York. Gina was awarded the Suffolk School Library Media Association’s School Librarian of the Year in 2014, and in 2017 she was named to *Library Journal*’s Movers & Shakers list as a Change Agent. Gina serves on numerous committees for ALA and YALSA and is an adjunct professor at St. John’s University. Look for her upcoming book, *Makers with a Cause* (Libraries Unlimited). Gina shares her work, musings, and reflections on her blog GinaSeymour.com and on Twitter @ginaseymour.

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JENNIFER TAZEROUTI is a National Board Certified Teacher-Librarian who has been working with adults, children, and teens for over 23 years. She received her Master of Library and Information Science from the University of South Carolina, and her Master of Education from Converse College. Jennifer is currently a school librarian at the Edwin P. Todd School in Spartanburg, South Carolina. She has served as the president of the South Carolina Association of School Librarians and the Union County Carnegie Library Board of Trustees.