The School Library as a Makerspace

SUMMARY

In addition to the usual book talks, orientation lessons, project-based research and work on Internet safety and best practices, a junior high school librarian shares two different learning modalities she has incorporated with her students. These results-based activities have motivated students to read more, improved their literacy skills, increased their time on task and fostered more collaboration in and outside the Library Media Center.

Twenty-first century teachers are drawing from several methodologies to keep students engaged in classrooms and school libraries. School librarians are equal partners in this process. In many junior high schools and high schools, the school librarian works collaboratively with teachers in planning lessons and in facilitating the research process. They discuss research strategies and demonstrate the various print materials and online resources they have available. Project-based assignments are very appealing because many facets are involved, such as:

- Describing a topic and how it relates to the overall learning goal
- Brainstorming sub-topics
- Discussing the assessment rubrics
- Demonstrating relevant information resources from which to gather facts
- Showcasing presentation styles and formats (email, paper, PowerPoint, Prezi or weebly)
- Understanding plagiarism and the importance of proper citations (using Noodle-tools, MLA, or APA).

According to Bea Baaden (2011), "*the school librarian's role is more important than ever. There's no other teacher in the school who can more effectively teach the College and Career Readiness Standard of, Research to Build and Present Knowledge, for K-12th graders.*" Based on the results shown in the structural equation models developed by Radlick and Stefl-Mabry (2015), school librarians are shown to have a statistically significant impact on school achievement in English language arts.

Well-equipped school libraries bridge the digital divide and make it possible for students to hone their computer

Alice Robinson has been the librarian at West Babylon Junior High School for the past 15 years. Before this assignment, she was a school librarian in the New York City metropolitan area. She also worked as a children's librarian at Queens Library. Robinson, a member of the West Babylon Teachers Association, has master's degrees from Queens College and City College, and a Ph.D. from Fordham University.

Alice Robinson,
West Babylon Teachers Association

science and literacy skills so that they can be on the cutting edge of 21st century knowledge. Sometimes the school librarian is the sole instructor and is responsible for lesson creation, lesson delivery, and assessing students. Consequently, he or she has to create lessons that are sufficiently rigorous, while at the same time engaging, to all students.

Utilizing Makerspace Resources

In West Babylon, the junior high school librarian has embraced the Makerspace Movement as a way to make the library more user-friendly and relevant to students' needs. Several years ago many school libraries and some public libraries carved out spaces where students could interact with resources in a safe manner under the watchful eyes of librarians or other facilitators. The idea of creating makerspaces has since expanded nationwide. The products and/or activities have also expanded based on the needs of students and financial outlays of districts.

Makerspace application was given a huge boost because the activities are in keeping with some of the NYS ELA Learning Standards: of Listening, Speaking, Reading, Writing and Research to Build Knowledge. Students work together collaboratively to create, experiment, explore and they build up stamina through failing, persevering, accomplishing, and reflecting on what they did.

The different activities are designed not only to engage students, but also to increase the speaking, listening and comprehension skills of the growing population of English language learners. This is in keeping with the NYS English Language Arts Standards:

- Anchor Standard, Integration of Knowledge and Ideas, RI. 6.7.

continued on following page

Community Dynamics

West Babylon is a community of about 43,200 residents located in Suffolk County on Long Island. The estimated median household income in 2013 was $79,954. Nearly 70 percent of households identify as white; nearly 16 percent as Latino; and more than 9 percent as Black. The area has a growing foreign-born population.

The seven-school West Babylon district comprises a high school, a junior high school, and five elementary schools. The total school population is 3,865. Each elementary school has a full-time school librarian and a part-time aide. Both the junior high and high school have library aides throughout the school day, as well as a full-time librarian.

While English is the predominant language spoken in the district, in the past three years, the district has seen an increase in students whose first language is not English.

"Everybody in this country should learn how to code because it teaches you how to think."
— Steve Jobs

"Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue."

- Standard SL. 6.6. "Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate."

- Anchor Standard, Comprehension and Collaboration, SL. 6.1. "Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 6 topics, texts and issues, building on other's ideas and expressing their own clearly."

Makerspace resources to supplement direct classroom instruction were purchased with school and grant funds. Some of these were: Brain Quests for grades six and seven; I Never Forget a Face (memory game); Intermediate Math Games; Name that State (U.S. geography game); Play-Stix (building structures); Hot Dots (reading comprehension cards); Talking Telescope (featuring NASA images); Octego (checkers/chess games) and Forensic Science Detective's Toolkit. Other resources include Ozobots, Legos, Cyber-boxing Robots, Craft projects, Teach and Talk Tablet – bilingual (Spanish/English), Firefly Light Constellation Projection, Minecraft and DK Coding workbooks.

For two weeks each semester, sixth-grade students were encouraged to interact with the resources in pairs or in small groups. The librarian observed the interactions and gauged students' understanding of the tasks.

Makerspace tasks involve students selecting a partner and together they decide on which resource they want to use. They have to follow the directions and then play the game. At the end they write a brief statement as to how they enjoyed the resource and sometimes leave a helpful hint to another user. Students voted on which card to attach to the game. Students blossomed during these activities and many took on leadership roles in their small groups. Six students returned to the library on their lunch hour to continue their activities and two borrowed games to take home.

Basic Computer Coding

Another teaching approach that exceeded expectations, was participating in the Hour of Code each December and throughout the school year. The Hour of Code, sponsored by Code.org, promotes an introduction to coding. The event takes place each year during Computer Science Education Week, but schools can host an Hour of Code all year round.

Code.org is a non-profit organization that aims to encourage students, and others, to learn computer science. It is geared for students in kindergarten through fifth grade.

To generate interest in coding and to activate students' prior knowledge, the librarian asked students to discuss the ways in which technology impacts society. For example: the use of credit or debit cards has sped up purchases. E-Z pass drivers can pass through toll-booths without stopping, freeing up valuable travel time. Devices found in many homes, such as baby monitors and security cameras, link to smart devices. Facilitating complex medical operations using Google glasses and robots, as well as medical scanning instruments for examining patients are invaluable tools.

Technology (texting, tweeting, emailing, Skyping, and reading e-books) has also changed the way people communicate. Teachers are using smart boards and other technology to deliver instruction. Students soon realize that technology plays a big role in all our lives and there are people behind the scenes (programmers) who write computer codes that make it all possible.

Next, students learned specific computer terminology that they would encounter online, such as: algorithms, commands, debug, pixels, program, scratch, unplug, workspace, driver and navigator, and paired programming.

After engaging in a comprehension quiz, students progressed to the introductory videos on www.code.org. The inspirational videos demonstrated the importance of knowing how to code. Many famous personalities and inventors were featured, including President Barack Obama, Nobel Peace Prize winner Malala Yousafzai, professional basketball player Chris Bosh, sSinger and songwriter Will-I-Am, Microsoft co-founder Bill Gates, Facebook CEO Mark Zuckerberg, Facebook COO Sheryl Sandberg and Dropbox

continued on following page

When students are given opportunities to create, lead, and collaborate, they will rise to the occasion.

co-founder Drew Houston. Ruchi Sanghvi, the first female engineer hired at Facebook, and Clothia.com founder Elena Silenok were also featured.

Students discussed the messages the videos conveyed. The primary message was that coding is fun and that students should consider it as one of their career choices. As Steve Jobs states (2013), *"Everybody in this country should learn how to code because it teaches you how to think."*

The librarian also encouraged students to borrow biography or nonfiction books from a nearby display. The display highlighted books on careers in Information Technology, coding, computer basics, developing Web applications and programming. Several students took up the offer and borrowed books from the display and from the regular shelves.

All of the coding activities were multidisciplinary and involved elements from English language arts, social studies, science and technology. Assuming that this was their first coding instruction, the librarian demonstrated the Elementary Level ~ Course 2, Stage 6: Maze: Loops. After the first three exercises, volunteers shared coding tips, which were enlarged on the smart board. Students were instructed to finish all 14 activities in the sequence before moving on. Within a day or two, several students progressed to Course 4. Some students utilized the videos and hints if they encountered problems. They also asked the librarian or their classmates for help. It was touching to see how willing students were to assist each other. Through perseverance and teamwork, students learned to think critically and became effective problem solvers.

The final segment involved logging on to the Hour of Code activities. These were, Minecraft Hour of Code, Star Wars Building a Galaxy with Code, Code with Anna and Elsa, Classic Maze, Make a Flappy Game, Infinity Play Lab, Play Lab and Artist. After students completed each activity, they printed out certificates, which were displayed in the hallways adjacent to the computer lab. Students often stopped by and proudly showed their certificates to teachers and friends and to parents during the school's open house.

Each morning, during the nationwide Hour of Code week, the librarian submitted a question during the announcements. The teacher or student who submitted the correct answer received a certificate and a small prize. The school's website and local publications featured their photos. Consequently, many teachers allowed their students to engage in coding activities, on the computer, when they completed their class assignments.

Conclusions and Future Goals

Both the Makerspace and the Hour of Code activities demonstrated that children learn in various ways and at their own pace. When students are given opportunities to create, lead, and collaborate, they will rise to the occasion. Many librarians are providing spaces in their school libraries for students to create and tinker with products. Public librarians have followed suit. No one size fits every one and the maker resources are as different as the colors of the rainbow. So too, are the computer coding activities. It is always gratifying to see a student who had difficulties with writing or reading, or one who never collaborated before, suddenly come alive and help classmates who needed assistance.

For the future, the librarian is planning to have students work with electronic kits, Legos, Rubik's Cubes, and robots; assemble and disassemble products; and create and animate storyboards and videos. By using multiple, self-differentiating modalities to engage students, school librarians are re-defining their roles and truly becoming "agents of change."

References

Baaden, B. (2011). *Baaden: School Librarians are indispensable.* Retrieved from *http://www.newsday.com/opinion/oped/baaden-school-librarians-are-indispensable-1.3141330*

City-Data.com. (2016, August). Retrieved from *http://www.city-data.com/city/West-Babylon-New-York.html*

Jobs, S. (2013) CS Fundamentals for grades K-5. Every student in every school should have the Opportunity to learn computer science [Video podcast]. Retrieved from *https://code.org/*

NY Learns Curriculum Management and Standards-based System, (2016, August). Retrieved from *http://www.nylearns.org/module/Standards/Tools/Browse?standardId=97231.*

Radlick, M.S. & Stefl-Mabry, J. (2015). School Libraries DO Increase Student Achievement.

The Bulletin, NY Library Association. Retrieved from *https://www.nyla.org/max/4DCGI/cms/review.html?Action=CMS_Document&DocID=6&MenuKey=eBulletin*