

FUTURES OF LEARNING

Friday, July 17, 2009

Learning from the Edges, Part 1: The Importance of Play

In the previous posts, we reviewed innovative uses of digital media within community libraries and museums that are designed specifically to provide visitors and patrons access to digital archives, virtual tours, and vast collections of cultural heritage materials. We also reviewed efforts to use digital media to involve visitors and patrons in the creation of new knowledge through the development of tagging activities, collaborative curating, and games for learning. The following posts consider another set of activities going on at the **edges** of these institutions that suggest other efforts to transform informal learning experiences for library and museum participants. As [John Seely Brown](#) (Hagel and Brown, 2005) famously asserts: "to transform the core, start at the edge." We're interested in these edge projects because they offer another set of ideas about how community libraries and museums could function as part of 21st century distributed learning networks. These efforts foster learning by providing opportunities for physical engagement with a range of objects and environments (from the material to the virtual). In this post, we discuss the examples of (1) toy lending libraries and (2) the user-friendly authoring/designing environment called *Scratch*. These efforts emphasize the importance of **play** and **creative expression** in learning and cognitive development.

TOY LENDING LIBRARIES

Unlike in Canada and parts of Europe, toy lending libraries in the United States did not really take off until the 1960s and 1970s. Wales, for example, has a national play policy that is integrated into the mission of the nation's toy lending libraries (Powell & Seaton, 2007). Although toy lending libraries have existed in the U.S. since 1935, the notion of a such a library is unfamiliar to many people. The U.S. toy lending libraries take a variety of forms: they can be based within a community library, be attached to a main library as a supplemental set of offerings, get organized as a cooperative neighborhood venture, or circulate as a mobile lending collection (Moore, 1995). Though these libraries have diverse structures and lending philosophies, they share an emphasis on the value of play and the importance of providing support to a wide range of children. Most cater to young children, usually newborn through kindergarten, though some have toys and other learning objects available for kids as old as 10.

One of the guiding principles of toy lending libraries is the importance of play for developing a range of skills in children. According to the [USA Toy Library Association](#), through offering "high-grade" toys to all, toy lending libraries foster children's development and thus serve an important educational purpose. In many toy lending libraries, toys including stuffed animals, musical instruments, puzzles, and crafts are available to be borrowed or used within the library space. Some of these libraries also offer books. Through interacting with a particular toy in the library space, children also learn values of sharing, community, and honesty. Many toy lending libraries also provide forums for parents, teachers, and others to discuss the educational value of play in general and certain types of toys in particular. In addition to providing opportunities for fun and educational play, toy lending libraries can be an important source of support for both parents and children. For parents, toy libraries can provide information about child development; they can also help parents to be more informed consumers. Some toy libraries also serve as informal childcare sites. The [Cuyahoga County Public Library system](#) in Ohio has a dedicated Toy Lending Library website that offers an online guide to assist parents in choosing the right toy for their child.

Other toy libraries are designed especially to offer a safe and nurturing space for disabled children to learn and play. The most well-known example of this type of toy library is the [Lekotek movement](#), originally begun in Sweden. Roughly translated as "play library," (Moore, 1995), Lekotek is a network of toy libraries (mostly concentrated in the Midwest and eastern U.S.), computer centers, and support services for families with children with special needs. The [Lekotek mission](#) is to use "interactive play experiences, and the learning that results, to promote the inclusion of children with special needs into family and community life"

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promote the inclusion of children with special needs into family and community life.

While many toy libraries focus on promoting the value of play and provide support for parents and guardians, others have as part of their mission a desire to reduce waste and consumption. When a toy can be checked out of a library rather than purchased, there are clear ecological benefits in that the same toy can be used by numerous children. This allows families to save money and children learn the value of saving and sharing. The [Mission Statement of the Heights Parent Center](#) in Cleveland Ohio clearly articulates this philosophy:

TLL helps families resist the urge to buy, buy, buy every toy on the market.
Use TLL to try different toys out before running out and buying them.
Rotate the toys in your home affordably.
Teach your children the value of borrowing rather than buying.

Another example of toy libraries emphasizing conservation is found in Fiona's Toy Library in Ann Arbor, Michigan (Brandt, 2008). This library shares some of the philosophy of the Heights Parent Center above (reducing waste, helping people save money) but is totally free, has no lending time limits, and does not charge for toys that are returned broken.

SCRATCH: Design for Learning, Design for Tinkering

Toy lending libraries typically emphasize the importance of material objects (toys) in developing important learning objectives: sharing, exploration, creativity. One of the most innovative efforts to integrate the digital with the physical is the virtual authoring environment called [Scratch](#). Created by Mitch Resnick and the Lifelong Kindergarten Group at the MIT Media Lab, *Scratch* is a "graphical programming language" designed to support the development of technological fluency" in young people. Although anyone can use *Scratch*, the target audience is 8- to 16-year-olds. *Scratch* is currently used in libraries, schools, museums, community centers, as well as homes. Key attributes of *Scratch* include promoting technological fluency, creativity, and "tinkerability" as well as building online communities of creative participation.



Scratch Home Page

Technological Fluency

The phrase "technological fluency" can have a range of meanings, but Resnick and his colleagues at MIT's Media Lab compare it to language fluency. (See the handout titled: ["Technological Fluency: The Clubhouse Learning Approach"](#) produced by Resnick and others at the MIT Media Lab (no date). Memorizing phrases and grammatical structures does not necessarily make one fluent in a language; rather, it is the ability to use the language creatively in complex situations. In the same way, technological fluency comes not from merely knowing how to use a technological tool, but instead through having the ability to creatively make things with it. With a tool such as a computer, technological fluency includes using and learning new ways to use the computer, creating based on one's own ideas, and "understanding concepts related to technological activities.

Scratch encourages technological fluency in a number of ways. First, it teaches programming language through using graphics that look like building blocks. The user snaps the blocks together (like Legos) in order to combine animation, photos, music, sound, etc. to create interactive projects (Resnick, 2007; Peppler & Kafai, n.d.). The blocks can only fit together in a certain way, which eliminates the frustration caused by inadvertent syntax errors. This type of intuitive programming language also allows users to "play with [their] code" testing out new ideas incrementally and iteratively" (Resnick, 2007). Through interacting with *Scratch*, users learn computational concepts, mathematical ideas, and design processes. The *Scratch* website also facilitates technological fluency through providing numerous resources, including

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cards that show users how to do everything from make their animated objects “move to a beat,” to “change color,” to “keep score.”

Creativity and Tinkerability

Scratch was created in line with what Resnick (2007) calls a “kindergarten approach to learning or the “creative thinking spiral.” This approach begins with **imagining**, and then progresses through **creating, playing, sharing, reflecting**, and then back to imagining. While these steps do not necessarily proceed in a linear fashion, the key point is that all of these elements are involved in the type of learning that is necessary for the digital age or what Resnick calls the “Creative Society.” *Scratch* promotes creativity by offering opportunities for users to learn the steps of dynamic and interactive design. One of the key goals, according to Resnick, is that *Scratch* encourages “tinkerability”: the environment/application makes it easy to put together fragments of computer programs, try them out, and take them apart again. The emphasis on tinkerability is hinted at in the *Scratch* name, which was appropriated from the technique of hip-hop deejays, who use vinyl albums and a turntable to create an array of sounds. Like deejays, users can make a wide range of creations, including animations, games, birthday cards, and reports.

Resnick and his **Lifelong Kindergarten** research team have deep expertise in the creation and design of mix-reality learning objects. The Lifelong Kindergarten researchers, along with the LEGO company created **LEGO MINDSTORMS**: “the first programmable brings and robotic kits.” More recently Lifelong Kindergarten research has inspired the development of a new invention kit called **The PicoCricket Kit** that integrates art and technology to spark creative thinking. The basic component of PicoCricket (called a “PicoBoard”) works with the *Scratch* programming language such that users can connect material (real-world) sensors to on-line (digital) *Scratch* projects.

The advertisement for the PicoCricket Kit features a header with the text "With PicoCricket, you can create musical sculptures, interactive jewelry, dancing creatures, and other playful inventions." and "MAKE YOUR CREATIONS COME TO LIFE!". Below this is a navigation bar with links: "What is it?", "Order", "Info", "Support", "Education", "About PICO", and "News".

THE PICOCRICKET KIT INCLUDES:

- A PicoCricket (a tiny computer that can make things spin, light up, and play music).
- Motor, Motor Board, and Sound Box.
- Beamer, Colored LED(s), and Display.
- Sound Sensor, Light Sensor, Touch Sensor, and Resistance Sensor.
- Easy-to-use software for programming the Cricket (works on both PC & Mac).
- USB-to-serial cable for connecting beamer to computer.
- A collection of craft materials and LEGO bricks to create custom modules.
- Ten project placements with sample Cricket activities.

Additional text includes: "For example, you can make a cat and program it to purr when someone pets it. Or you can make a birthday cake and program it to play a song when someone blows out the candles. See the [PicoCricket in Action](#)." and a quote from Kjeld Kirk Kristiansen, Owner and Vice Chairman of The LEGO Company: "The PicoCricket captures the LEGO spirit: it sparks the imagination, stimulates creative thinking, and engages children in playful learning."

PicoCricket Kit Components

Collaborative Community

One of the most appealing aspects of *Scratch* is the user community that has developed around the authoring environment. The creation of community was an explicit objective for the development of *Scratch*. As the original designer of *Scratch*, Resnick believed that technological fluency is based in learning from, and sharing with others. This is in contrast to many other Web 2.0 sites, which support uploading on the part of producers and commenting on the part of viewers, but not necessarily meaningful interaction between the two. The *Scratch* website is designed to facilitate connection among users, such as through commenting on projects, joining forums, and participating in galleries (formed around common topics). Another noteworthy aspect of the community is how it emphasizes the positive, again to encourage learning, sharing, and community. For example, users can “love” projects but they cannot give them only one or two stars, as is the case with other websites

such as YouTube. Again, this design feature is intentional in order to promote a supportive community (Resnick, personal communication). As of July 10, 2009, "There are 473,487 projects with a total of 11,948,669 scripts and 3,702,846 sprites created by 72,121 contributors of our 320,690 registered members. Another key to the opportunities for creative thinking and designing that are built into *Scratch* is that projects are remixable. This means that any member of the *Scratch* community can download the source code of a project to create a new project. Creative appropriation is in fact encouraged. As of August 2007, 15% of the approximately 24,000 shared projects were remixes (Monroy-Hernandez and Resnick, 2008). When a new remix project is posted, a link to the original project appears in order to credit the creator. This practice has led to discussions regarding originality, creativity, and copyright.

Learning From Remix Culture

Scratch was developed in accordance with a long tradition at the Media Lab of a philosophy which focuses on the value of teaching students to design learning environments rather than simply use them. This philosophy of teaching young people to make music (or visual art, etc) rather than simply consume it informs many after-school and community-based informal education programs that make use of digital audio software to encourage young people to recognize their creative potential. See for example:

- **Digital Youth Network** provides students tools and facilitates their ability to become creators who can and innovators.
<http://iremix.org/>
- **Berklee City Music Program** is a national network of institutions offering the Berklee PULSE music method to under-served teens.
<http://berkleecitymusicnetwork.org/>
- **Youth Radio** was founded in 1990 to train young people from under-resourced public schools, community-based organizations, group homes and juvenile detention centers in broadcast journalism, media production and cutting-edge technology.
<http://www.youthradio.org/about/youth-programs>
- The **Hiphop Archive Project** is dedicated to increasing youth representation and participation in artistic creation and collaborations.
<http://www.hiphoparchive.org/university>
- **Rock the Classroom** restores music education in under served public elementary schools by using music and songwriting to complement literacy curricula.
<http://www.rocktheclassroom.org/whatwedo.html>
- **A Place Called Home** provides cultural arts program to at-risk youth in the form of music, dance, and fine arts.
<http://www.apch.org/creativeexpression.php>

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Scratch Research Wiki: <http://info.scratch.mit.edu/Research>

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