Digital Media and Technology in Afterschool Programs, Libraries, and Museums

Becky Herr-Stephenson, Diana Rhoten, Dan Perkel, and Christo Sims

with contributions from Anne Balsamo, Maura Klosterman, and Susana Smith Bautista

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Series Foreword

The John D. and Catherine T. MacArthur Foundation Reports on Digital Media and Learning, published by the MIT Press in collaboration with the Monterey Institute for Technology and Education (MITE), present findings from current research on how young people learn, play, socialize, and participate in civic life. The Reports result from research projects funded by the MacArthur Foundation as part of its $50 million initiative in digital media and learning. They are published openly online (as well as in print) in order to support broad dissemination and to stimulate further research in the field.

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Introduction

This report synthesizes research and examples of the diverse ways in which organizations approach and integrate digital media and technology[1] into their youth programs, practices, and philosophies. We aim to clarify a framework for understanding organizational efforts related to digital media and technology and to establish a foundation for future research in this area. Our guiding questions for this report are:

▪ How have digital media and technology been incorporated into youth programs within educational, civic, and cultural organizations, including afterschool programs, libraries, and museums?

▪ What types of participation and learning do digital media and technology support and/or complicate within these organizations?

▪ How can research in the area of digital media and learning contribute to better integration of technology within individual organizations and better coordination via technology among organizations?

To answer these questions, we examine the ways in which three different organizations—after school programs, libraries, and museums—have integrated (or not integrated) technological infrastructure and digital practices into their youth programs. We embark on this investigation with an eye toward understanding not just how institutions implement digital media and technology but also why and to what ends they do so.

We begin by contextualizing the relationships and links between organizations by describing the wider field of institutions that shape contemporary young people's lives. In particular, we draw attention to shared historical links to Progressive Era educational values and to a shared embrace of youth development frameworks, both of which we see as related to current discussions around the potential positive roles that digital media and technology might play in the lives of youth. We then review the varied roles that afterschool programs, libraries, and museums play in providing technological infrastructure for young people and supporting youth-driven digital media practices. Finally, we consider if and how resources and practices might be leveraged to help cohere this currently fragmented field of organizations, strengthening and expanding their potential within learning ecologies. Thus, this review represents an effort to expand knowledge about the different ways that organizations "contribute to the contours of childhood in late modern society" (Milligan and Brayfield 2004, 276) and to provide a basis of information for considering future research on and programming in the area of digital media and learning.

Youth Programs in Educational, Cultural, and Civic Organizations: A Loosely Connected Field

An *organizational field* represents a system of varied organizational actors, actions, and relations that carry out different but interrelated activities (Scott 1994). The field of organizations that serve young people is less coherent than other more established organizational fields (McLaughlin et al. 2009). Some youth programs are affiliated with national organizations; others are sponsored by public institutions or agencies, including parks and recreation departments, public library systems, and schools. Some are operated as subunits within private organizations such as religious groups, museums, and civic organizations, while others are run by freestanding community-based or grassroots organizations. These youth programs also vary in structure and focus. Some offer a facility where young people can gather; others link participants to a mentor or group that meet in spaces outside of a youth center or school, sometimes including online spaces. Some programs focus on a single theme or activity (e.g., sports or science), and others offer an array of choices (Raymore et al. 1999). Within the general category of youth programs, activities and initiatives frequently

are targeted at young people based on age, grade level, socioeco-
nomic status (SES), gender, race and ethnicity, and scholastic
performance.

Given the diversity in focus, location, affiliation, and partici-
pant demographics, it can be difficult to identify exactly what
it is that coheres these different organizations and programs
aside from their obvious involvement with youth. Through our
review of digital media and technology in educational, civic, and
cultural organizations, we have identified two epistemologies
that appear to inform practice and philosophy across organiza-
tions: progressive education and youth development. Emerging
from these shared roots, the organizations we examined also
share understandings of childhood and adolescence, concerns
about youths' future participation as citizens, and pedagogical
approaches to digital media and technology.

Roots of Afterschool Programs, Libraries, and Museums: Progressive Era Reforms and Youth Development Frameworks

During the Progressive Era in the United States (approximately 1880–1920), numerous social policies and changes in public education were enacted as part of a large-scale social reform movement. In his book on school reform, Maurice R. Berube provides a useful summary of the Progressive Movement:

At the heart of progressivism were efforts to expand democracy, sympathy for the immigrant poor, attempts to counterbalance the rise of unbridled wealth with the new industrialism, and a drive against municipal corruption. Specific goals included a fight against big banks and monopolies, regulation of railroads and the food and drug industry, a campaign for child labor laws and women's suffrage, and an emphasis on conservation. (1995, 1)

One important part of the Progressive Movement was promoting change in America's public schools. Composed of different reform thinkers, the predominant themes of progressive education include: the embrace of flexible curricula driven by student interest; teachers as facilitators or guides within a learning environment that encourages discovery; and a connection between the goals of schooling, the needs of the community, and social change writ large. Further, progressive educators emphasized the

use of shared scientific measures of student success as formative feedback to monitor and inform curricula and pedagogy (Hayes 2006). These themes resonate today in many discussions about how digital media and technology can enhance the educational experiences of youth in a variety of organizational settings.

Of particular relevance to our investigation herein is John Dewey's critique of understanding schools in isolation from other sites and experiences for learning. In his lecture "Waste in Education," Dewey pointed out the difficulty of separating school from children's everyday experiences:

> From the standpoint of the child, the great waste in the school comes from his inability to utilize the experiences he gets outside the school in any complete and free way within the school itself; while, on the other hand, he is unable to apply in daily life what he is learning at school. That is the isolation of the school—its isolation from life. When the child gets into the schoolroom he has to put out of his mind a large part of the ideas, interests, and activities that predominate in his home and neighborhood. So, the school, being unable to utilize this everyday experience, sets painfully to work, on another tack and by a variety of means, to arouse in the child an interest in school studies. (1915/2001, 46)

In this vein, one goal held by Dewey and his colleagues was to identify ways to break down barriers that separated the knowledge and experiences taught and sanctioned by schools from the knowledge and experiences that were important parts of students' everyday lives. This work continues to be a challenge for educators interested in critical pedagogy, multicultural education, and radical notions of education and learning, such as those that inform the Digital Media and Learning initiative.

As Progressive Era educators had interests in facilitating learning and protecting children's well-being, it is no surprise that the organizations on which we focus in this report find their roots

in this same historical period. Youth services in libraries, which initially took the form of children's rooms—a specialized, separate space housing literature for children—became widespread in the United States around 1890 (Jenkins 2000). Similarly, by the late nineteenth century, privately funded afterschool programs had become important organizations for structuring children's daily activities outside of school. Afterschool programs at this time were often established in partnership with schools, churches, or municipal parks, run primarily by volunteers, and offered free of cost to families (Halpern 2003). Museums at the time acknowledged their role in providing educational opportunities and worked to expand access and appeal to a broader audience. George Hein (2006) describes specialized museum education programs as "paralleling the emergence of modern human development theory, the establishment of the social sciences as legitimate academic subjects, and the establishment of the modern state school and its rejection of the classical curriculum" (342).

   Although most Progressive Era reforms were well-intentioned, many of those targeted at young people were prompted by concerns about youth—and, in particular, concerns about the influence of poor and immigrant youth on adolescents within the emerging middle class. As Janet Finn describes:

Images of deviance, typified by "lower-class" youth, have been historically deployed to represent a threat to the work ethic, moral character, and safety of "proper" youth. . . . Youth counselors wrote advice books for young men, warning of the temptations of the city, and posing lower-class, immigrant youth as a threat to the innocence of the young men of the emergent middle class. These writings represented youth for the emerging middle class as a stage of transition from childhood to adult-

hood, the success of that transition rooted in self-restraint. Lower-class youth, on the other hand, were associated with danger and required social rather than self control. (2001, 171)

These class and race-based tensions cannot be overlooked in the history and legacy of youth programs. Indeed, beliefs about youth—specifically, the need for supervision and guidance—and concerns about young people's unsupervised behavior—were the primary impetuses for implementing youth programs throughout much of the twentieth century (Apsler 2009).

The 1990s experienced a resurgence of interest in afterschool programs accompanied by a new paradigm for understanding youth. This new paradigm, *youth development*, emerged from the fields of psychology and social work; it focuses on teaching adolescents social and behavioral skills thought to contribute to future success. Youth development as a philosophy and an approach (as well as positive youth development, a slight variation on the concept) arose as a counterforce to prevailing negativity toward young people, especially those in inner-city neighborhoods (Eccles and Gootman 2002; Lerner et al. 2005; Lerner, Dowling, and Anderson 2003). As Jennifer Brown Urban notes, youth development represents "a new vision and vocabulary for discussing young people…where youth are no longer seen as problems to be managed, but rather as resources to be developed" (2008, 128). Youth development challenges psychological theories of adolescence that emphasize the inevitable, uncontrollable, and universal "stress and storm" (Hall 1904) of the teenage years and makes considerable efforts to consider the diversity of adolescents' lived experiences in its philosophy and practices.

Since its introduction, youth development has provided a framework for many youth organizations, including afterschool programs, youth services at libraries, and educational programs at museums. Youth development can be understood as an instantiation of Progressive Era values, particularly those related to access to education and safe, supervised spaces within communities. As we will discuss in the following section, the youth development ideology has been an important guide for youth organizations in integrating digital media and technology into new and active programs.

Youth Programs and the Challenge of Digital Media and Technology

Digital media and technology are now culturally and economically powerful parts of contemporary middle-class American childhoods. For many young people, digital media and technology provide ways to express identity, communicate with peers and adults, and cultivate and maintain essential social relationships (Ito et al. 2009). Young people's media ecologies include multiple media and technology in differing formats, locations, and combinations, including print (children's and young adult literature, newspapers, magazines, comics, advertisements, and so on), traditional media (music, radio, television, and film), and new media (digital media, including video games, software, and online sites), as well as mobile and Web-based technologies (Horst, Herr-Stephenson, and Robinson 2009). Further, toys, clothing, and other consumer goods branded with licensed characters extend media properties quite seamlessly into the fabric of childhood (Seiter 1993). As with youth programs, young people appear to move between media and spaces for media, and appear to develop knowledge and skills through participation with media.

Organizations face a number of challenges as they weigh the risks and benefits of digital media and technology for youth. Many are struggling with how best to provide *technological infrastructure* (hardware, software, and networking) for young people and to support youth-driven *digital media practices* (participation, production, and cocreation). On an operational level, many individual brick-and-mortar organizations have ramped up physical access to technology through computer labs, media and software collections, or other kinds of technologically enhanced environments. Similarly, some youth organizations have responded to pressures around student learning and achievement by offering "twenty-first-century skills" courses, software workshops, and drop-in tech support for learners. Finally, on a cultural level, organizations are being asked to interpret, moderate, and mediate youth relationships to digital media and technology through the establishment of new rules, values, and expectations.

Some organizations, acknowledging both the importance of digital media and technology in young people's lives and the possibilities they offer for learning and engagement, have made significant efforts to adopt technological infrastructure into their missions and educational programs. These efforts are complicated by the dynamic nature of digital media and technology; because of the quick development cycle for new technology, specific hardware or software often are outdated before they can be completely integrated into youth programs. Some organizations have worked to enable particular digital media practices introduced by the young people they serve as part of their educational programs. These efforts to incorporate digital media infrastructure and practices are, of course, uneven. While

some organizations have had great success mobilizing resources to integrate digital media and technology in youth programs, others have struggled to identify support for such programs, and still others have rejected the idea of introducing them altogether, instead emphasizing traditional literacy skills.

Through their approaches to technology, organizations contribute significantly to shaping and opening access to digital media practices, including legitimizing digital media and technology practices in spaces and activities in which they were previously forbidden. For example, by providing Internet and computer access alongside digital sound and video production workshops, an organization such as a library reinforces its belief that media and technology are valuable components for young people's learning—even within an organization that has historically focused on printed texts (see box 7). On the other hand, while it is rare for an organization to reject digital media and technology outright, some have taken an explicit stance that prioritizes other activities over those involving media or technology as a way of articulating their beliefs about what youth need (see box 1).

In the sections that follow, we examine afterschool programs, libraries, and museums, highlighting examples of the types of digital media and technology these organizations have incorporated, how they have done so, and toward what purposes. We considered a variety programs, ranging from what one might consider "high-tech" (digital media and technology are central in form and/or content) to "high-touch" (digital media and technology are less visible or are considered less valuable than traditional interpersonal relationships and activities). Although our

review is by no means exhaustive, it is representative. Following the sections on afterschool programs, libraries, and museums, we expand the idea of youth media ecologies introduced above to question the role that digital media and technology play (or could play) in supporting youth organizations as nodes within young people's learning ecologies.

Box 1
826 Valencia—High Tech versus High Touch[2]

> Since 2002, a small storefront at 826 Valencia Street in the Mission District of San Francisco has sold pirate supplies. The store encourages fantasy, exploration, and discovery. Nooks, crannies, and countless small drawers promise bounty and surprise for the curious: opening what looks like a library card catalog reveals an assortment of glass eyes; sifting through a bin of sand unearths buried plastic gems; rounding a darkened corner unveils an aquarium. It's a delightful and playful space.
>
> In actuality, 826 Valencia is a writing and tutoring center for local children and teenagers, ages 6 to 18.
>
> The project is the invention of Nínive Calegari, an educator, and Dave Eggers, the popular award-winning author and publisher. The main educational motivation behind 826 Valencia is simply that public school kids need more adult attention and help when it comes to learning—classes are too large; teachers are overstretched; parents and caregivers work increasingly long hours. This position structures the bulk of 826 Valencia's programming. Whether it's staffing afterschool tutoring, providing volunteers to work alongside teachers in classrooms, running evening and weekend writing workshops, or hosting school field trips, 826 Valencia is largely in the business of lining up adult volunteers with small groups of students.

Box 1
(continued)

These programming efforts don't foreground digital media. In many ways, 826 Valencia purposely abstains from digital media in its programming. This stance may partly reflect 826 Valencia's founding commitment to providing close one-on-one interactions between adults and students. According to such a philosophy, it is greater adult involvement in the lives of youth that needs to be fostered, not competencies with a particular form of media per se. But the absence of digital media in 826 Valencia's programming also seems a deliberate defense of print media, even a challenge to the popular claims that the Internet and digital media will necessarily supplant print media and the book in particular.

Eggers has publicly challenged these popular claims, calling them exaggerated and even classist. He notes that despite the supposed digital saturation of today's youth, print media and books remain enormously popular among youth. Eggers's position doesn't reject the importance of digital media so much as criticize the assumption that today's kids are generally disposed toward electronic media at the expense of print. As he puts it, digital media and print media don't have to be in a zero-sum contest. He also questions whether the idea that today's youth are enamored of digital media embeds class assumptions. As he states:

The students we serve at 826, by and large, just aren't addicted to electronic media—not in the way we're led to believe all kids are. Most of our students don't have cell phones of their own, and they don't have computers at home. . . . Even at the high-school level, the students we work with aren't soaking in the Internet all the time. To some extent all the doom about the printed word is a class thing. Wealthier kids who can afford their own phones and computers are probably spending more time online and in some cases, less time with books. (Elliot and Eggers 2009)

Box 1
(continued)

In keeping with Eggers's position that print and digital media don't have to be related antagonistically, 826 Valencia does make extensive use of digital media. It just doesn't feature digital products as the objects of student's creative production. Instead, digital media fall into the background, as infrastructure for production and distribution. Youth at 826 Valencia use computers to compose and edit their work, and they rely on online stores and distributors such as Amazon.com to promote, sell, and deliver the physical works they produce. The programming remains committed to youth voice and creative expression, goals that prefigure choices about what sort of media object will result from these processes.

Afterschool Programs: Intermediary Spaces for Learning

As recently as 2003, afterschool education has been described as an "emerging field" (Noam, Biancarosa, and Dechausay 2003, 1). Across this developing movement, stakeholders with divergent interests regarding the purpose and goals of afterschool programs[3] shape the offerings available to young people as well as the discourses about these young people and their afterschool activities. Afterschool programs have been described as "intermediary spaces" (5), a term that highlights the contestation among different groups invested in children's education and well-being. As Noam, Biancarosa, and Dechausay write:

Afterschool connects to academic work without serving as a school, takes on aspects of family life (such as comfort, security, recreation) without becoming a family, and instills community-consciousness in children without becoming a civic group. Such flexibility creates risks, such as the risk of power struggles between competing groups and interests, but it is also a source of extremely productive tension and a stimulus to creativity, leadership, and effective time use. (5)

Tension resulting from competing expectations for afterschool programs can be seen in the current emphasis on the role of afterschool programs in improving academic achievement.

Glynda Hull (2008) describes the current push in educational policy to make afterschool an extension of the school day and the standards-based instruction that takes place therein. She notes a new trend in some state and federal funding for afterschool programs that requires formal evaluation of learning gains in afterschool programs, sometimes even mandating additional standardized testing. These types of pedagogical and accountability requirements are at odds with Progressive Era aims of afterschool programs related to recreation and exploration of subjects outside of the purview of school curricula.

Box 2
Afterschool Programs versus Extracurricular Activities

As we use the term, *afterschool programs* refer to organized, adult-supervised, activity-based programs run during the afterschool hours (approximately 3 to 6 p.m.) at schools and community organizations. Currently, public schools are the major provider of afterschool programs in the United States, followed by YMCAs, religious organizations, Boys and Girls Clubs, and private schools. These programs are often funded by government grants and charitable donations from corporations and are offered to families at low or no cost, providing childcare for working parents as well as opportunities for students to receive academic support and participate in recreational activities and sports.

By comparison, while not entirely unlike afterschool programs, *extracurricular activities* bear important differences. Extracurricular activities often take place outside of school and community-based youth organizations. These activities are frequently offered by individual for-profit companies, individuals, or and organizations and tend to cost significantly more than afterschool programs. For example, private music lessons, tutoring services, or enrichment

Box 2
(continued)

classes in subject areas such as art, dance, or martial arts (to name just a few) fit within our category of extracurricular activities.

We distinguish between afterschool programs and extracurricular activities because of the important roles each type of organization plays in defining different types of childhoods and constructing children as particular types of learners. If, in the dominant understanding, afterschool programs are to compensate for deficits in children's lives through play and socializing with friends, extracurricular activities are to serve as opportunities for children to get ahead and to prepare for participation in the adult world. Annette Lareau (2003) has argued that extracurricular activities are increasingly important to middle-class childhoods. Lareau uses the term "concerted cultivation" to describe the efforts that middle-class families use to ensure their children's future status by engaging them in activities considered to have a high level of cultural capital.

Digital media and technology have become an important offering in extracurricular activities. Summer programs in media production—such as the DigiPen Summer Institute, Digital Media Academy, and Giant Campus Summer Camps—offer intensive instruction in various types of digital media production, including video and game design. Some, like the Digital Media Academies, partner with universities to use campus resources, reinforcing the connections between certain technological skills and higher education and future employment. Further opportunities for investigating technology and digital media can be found in retail spaces such as Apple Stores, which offer a series of workshops for children and families to learn to use Apple's hardware and software for creative production and productivity.

Although both afterschool programs and extracurricular activities are working hard to address the needs of young people

for learning about technology and digital media, it is clear that they distribute resources unequally and often hold contrasting objectives, the former tending toward normative aims, the latter promising distinction. Partnerships with corporations such as Intel, Best Buy, and Microsoft have helped both afterschool and extracurricular activities acquire hardware and software and shape the aims and goals of the programs in explicit and implicit ways. However, programs that are linked to private rather than public resources have more flexibility in keeping up with new technologies, in part due to issues of scale and in part due to the pressures of historical expectations.

Since 1998, the 21st Century Community Learning Centers (21st CCLC) initiative has been a major source of federal funding for afterschool programs, supplemented by state, local, and private funding. In 2002, the No Child Left Behind Act (NCLB) reauthorized the 21st CCLC program, focusing on funding "an afterschool program model that provides . . . services to students attending high-poverty, low-performing schools" (21st CCLC 2008, 1). Although each state has its own programs and procedures for addressing afterschool programs, for many areas of the country the 21st CCLC initiative has not only turned new attention toward the afterschool needs of children but in so doing has prized academic achievement over social development aims for afterschool programs.

Recently, adding to the complexity and tension around the academic versus social purposes of afterschool programs are the

competing discourses about what young people need from digital media and technology and how best to serve those needs. Sullivan, Vander Leest, and Gordon (2008) describe the efforts to incorporate technology into youth programs since the 1990s as efforts to address two discourses: the digital divide and workforce development. These two discourses frame both real and assumed needs of the young people and families served by afterschool programs. In so doing, they have influenced the ways in which technology as well as digital media have (and have not) changed the operation and offerings of afterschool programs. While the concerns about the digital divide have prompted organizations to provide computer and Internet access, the discourses around workforce development have pushed organizations to think beyond the infrastructure of technological access to the practices of technological fluency (Barron 2004) and digital literacy (Buckingham 2007). In preparing the present review of literature on digital media and technology in afterschool programs, we have kept in mind the dual discourses of the digital divide and workforce development, working to understand how they affect extended, enriched, and intentional learning.

Digital Media and Technology Afterschool: Extended, Enriched, and Intentional Learning

Within this era of contestation over social versus academic purposes, afterschool programs can be further segmented into three large groups based on approaches to learning (Noam, Biancarosa, and Dechausay 2003). The first, "extended learning" applies to programs whose primary goals are providing time, space, and support for students to complete homework or to obtain extra help or tutoring in academic subjects (4). The second group, "enriched learning," might also be described as "interest-driven learning" (Ito et al. 2009), and focuses on "project-based learning activities . . . self-direction, exploration, and hands-on experience." Examples in the afterschool space include computer clubhouses and youth media programs. Finally, the third group of activities is described as "intentional learning and programming" intended to "foster non-academic skills and social abilities" in students (Noam, Biancarosa, and Dechausay 2003, 4). This category encompasses activities such as sports teams or groups dedicated to recreation, such as gaming clubs. We use these distinctions to organize the remainder of this section, discussing examples of programs using digital media and technology within each grouping.

Extended Learning

Afterschool programs that fit the "extended learning" category align with the academic bent of the movement and tend to operate with close attention to state and national content standards. As such, digital media and technology are implemented in the service of improving academic achievement and are aligned closely with content standards. Both the International Society for Technology in Education (ISTE) and the Partnership for 21st Century Skills have prepared national standards for technology that can be applied to both school and afterschool settings.[4] These standards focus on information literacy (e.g., search skills, assessing credibility of information), problem solving, creativity, and communication. Within these standards is a strong sense of urgency in preparing students for their future roles as literate, informed, and responsible citizens by cultivating "twenty-first-century learning and literacy skills" through instruction and activities (Hall, Israel, and Shortt 2004; Jenkins et al. 2006).

Afterschool programs in the fields of Science, Technology, Engineering, and Math (STEM) also focus on academic achievement and workforce training. Governmental and corporate funders support STEM initiatives and programs as well as teacher training in order to increase and cultivate the pool of talented and qualified math and science teachers in K–12 public schools.[5] Thus, like twenty-first-century skills programs, STEM programs also tend to be guided by national and state content standards and focused on skilling future participants for the workforce. Afterschool programs have been found to play an important role

in cultivating student interest in STEM fields through opportunities for mentorship and immersion in the subject matter.

Many afterschool STEM experiences take the form of math, science, and technology-related competitions, which offer young people opportunities to compete and connect with other students on a state, national, or even international basis. Because of the emphasis on cutting-edge relationships between education and industry, most STEM programs and competitions bring together schools and corporations (mainly high-tech firms). For example, the Intel International Science and Engineering Fair,[6] Science Olympiad,[7] the U.S. First Robotics Competition, Tech Challenge, and Lego Leagues,[8] and the Imagine Cup[9] bring together the worlds of school and work by involving both students and professionals from the relevant field(s). Such relationships not only provide rich academic support but also offer important ways for young people to learn about the norms and expectations of employment in STEM fields.

Within this spectrum, the MOUSE program[10] represents a unique approach to extended learning that moves fluidly between the school day and afterschool hours. MOUSE supports elementary, middle, and high schools in establishing a "MOUSE Squad" at the school. MOUSE Squad members act as "level 1" tech support at the school, much like a help desk. Students are responsible for maintaining, repairing, and supporting all of the computer-related needs in their schools or community organizations; technicians troubleshoot computer problems, clean and maintain technical equipment, and support staff in their regular computer use. Each school has two adult coordinators that supervise students in providing tech support to the school

community. Students apply to participate in the Squad and, once admitted, go through ongoing training to improve their skills in using and troubleshooting technology, as well as "soft skills" related to customer service and working with other community members. In addition to the focus on content mastery, the school–community service component of the MOUSE program is a notable and valuable element of the program. Young technicians are also provided opportunities for career readiness, including a focus on skills related to teamwork, problem solving, literacy, communication, job etiquette, and so on.

Enriched Learning

The emphasis on standardization in current educational policy-making and programming has made it increasingly difficult for students to explore individual needs and interests. Because student performance on standardized tests has been placed at the center of school funding and governance, those tests and accompanying test preparation materials tend to dictate the form and content of the school day. Enriched learning, characterized by interest-driven, intensive engagement with subject matter, survives only in the margins of schools such as after-school programs. In this section, we examine three examples of afterschool programs that demonstrate characteristics of enriched learning—computer clubhouses, community-based centers, and youth media programs. These examples have been chosen based on the availability of literature and because they demonstrate different aspects of enriched learning.

One of the longest-running and best-known afterschool programs related to digital media and technology is the Computer Clubhouse movement, which began in 1993. The first Clubhouse was established at the Computer Museum/Museum of Science in Boston in partnership with the MIT Media Lab. In 2000, Intel became the title sponsor of the movement, formally naming it the Intel Computer Clubhouse Network. Other sponsors have since joined the Network, including Adobe Systems, Autodesk, Macromedia (now part of Adobe), Hewlett-Packard, LEGO Systems, and Haworth Furniture, Inc. With the support of these sponsors, the Network expanded to 49 sites in nine countries around the world by 2001 and to 100 sites in 20 countries by the end of 2005.[11]

The Computer Clubhouse Network originally grew out of efforts to facilitate technological access for inner-city and low-income families by providing computer hardware and software at community centers and schools. From the beginning, the core of the Network philosophy has been the belief that "schools are not the only (or necessarily the best) place for learning to occur" (Resnick, Rusk, and Cooke 1998, 2). As an alternative to more typical school-based pedagogies, the Clubhouse learning model embraces four Progressive Era principles: learning by designing, interest-driven and self-directed participation, building and valuing a diverse community, and safe experimentation and innovation. As leaders of the Clubhouse movement explain: "The point is not to provide a few classes to teach a few skills; the goal is for participants to learn to express themselves fluently with new technology" (Resnick, Rusk, and Cooke 1998, 2). Activities that are part of the Clubhouse model use a wide range of technology

and encourage a broad set of media creation and production activities. Importantly, however, digital media and technology are not the only activity foci of the Clubhouses. As sites dedicated to enriched learning, Computer Clubhouses emphasize students' responsibility and agency in identifying subjects of interest to them and provide support and resources for students to dig into those subjects, whether or not they involve digital media or technology. In fact, a 2008 evaluation of the program showed that over half of participants (55%) reported spending a significant amount of time at the Clubhouse but never engaging in computer-related activities (Gallagher 2008).

Encouraging the development of self-selected interests is an important and unique element of Computer Clubhouses, not only because it gives participants "freedom to follow their fantasies" (Resnick, Rusk, and Cooke 1998, 8) but also because it opens up these types of opportunities to a wider group of children. As Resnick, Rusk, and Cooke describe:

The Clubhouse is designed to support youth in developing their interests. While youth from middle-class households generally have many opportunities to build on their interests (music lessons, specialty camps, and so on), the target audience of the Clubhouse has few such opportunities. For most Clubhouse participants, there are no other constructive after-school options. And many do not even have a clear sense of their interests, let alone how to build on them. (1998, 8)

Opportunities for interest-driven exploration in the Clubhouses are not only offered through the provision of materials but are enabled through the support of mentors. In fact, the mentorship strategy is a crucially important part of the work of the Clubhouses. Adult mentors at the Clubhouses act not only as guides and teachers for youth but also work on their own

projects. It is in large part because of these mentors that the Computer Clubhouse movement, despite being more than fifteen years old, continues to be a site of social motivation and technological innovation in the afterschool learning space.

Like the Computer Clubhouse movement, the Boys and Girls Clubs of America (B&GCA) focuses on providing its members with opportunities for enriched learning, including learning with and about technology. B&GCA provides a multitude of programs for children and families through 4,300 Club locations in all U.S. states and territories. As an organization dedicated to serving young people, B&GCA has been attentive to the growth of digital media and technology as tools for learning and expression among youth. Because B&GCA is a national organization with independently run, locally organized Clubs, the implementation of digital media and technology programming at each Club is left to the discretion of the staff and the members. This flexible organizational structure enables Clubs to "share the common characteristics of the national movement (i.e., a 'safe space' for kids), while enabling the discretion clubs need to adapt to the circumstances of local communities and club members" (Sullivan, Vander Leest, and Gordon 2008, 9). This structure provides a significant opportunity for digital media and technology programs to move beyond standardization and support for academic achievement to connect with the interests and needs of particular kids, thus enabling the Club to facilitate opportunities for enriched learning.

The opportunities for enriched learning with digital media and technology as facilitated by the B&GCA in 2009 are the result of growth and change in the organization's approach

over the past ten years. In 1999, B&GCA initiated Project Connect, a pilot initiative funded by Microsoft and Shaquille O'Neal to create computer labs at fourteen Clubs across the country. Project Connect was conceived in response to concern over the digital divide, and particularly to findings that showed access to technology was particularly unequal for African Americans, Hispanics, and people living below the poverty line. The goals of Project Connect were related to basic computer literacy, and included both teaching young people about the technical aspects of computers (e.g., how they work and how to use specific software and the Internet) and familiarizing them with the technological power of computers as tools for personal communication and economic success (Henriquez and Ba 2000)These goals were met through technology skills classes, homework help using the computers, and open lab time. Although Project Connect was only a two-year pilot program, it set the stage for B&GCA's current technology initiative, called Club Tech, which is sponsored by Microsoft and the Best Buy Children's Foundation.

Whereas Project Connect focused on the provision of infrastructure, Club Tech[12] makes available resources for Clubs to provide onsite and online training in technological and digital practices. Within the Club Tech initiative, the B&GCA provides training in technology skills through Basic Training and Skill Tech courses, which are offered to all members (including families) and include basic skills around productivity software and Internet literacy. Members 6 to 18 years old can also complete five tutorials in Club Tech's Digital Arts Suite (i.e., Web Tech, Design Tech, Photo Tech, Music Tech, or Movie Tech) online as well as participate in activities and instruction onsite at their local Club to learn about digital arts and media production. In

addition, Club Tech supports local, regional, and national Digital Arts Festivals each year in which members are invited to submit their writing, digital photos, graphic and Web designs, and audio, video, and multimedia productions.

On the whole, the Club Tech program has been successful. A recent evaluation notes, however, that the program faces various challenges including, for example: adjusting offerings to better serve members at different ages, engaging teens more frequently and positively, and recruiting and retaining staff (Sullivan, Vander Leest, and Gordon 2008). Despite these challenges, the B&GCA has integrated technological infrastructure and digital media practices into the organization's existing culture and structure quite successfully, offering meaningful opportunities for enriched learning. Club Tech extends the widespread understanding of Clubs as "opportunity spaces" (2008, 10), wherein a member can draw on any of the Club's resources in order to explore the world, develop new skills, and establish social relationships. Thus, it is important to note here that, while technology and digital media are draws for many members, particularly teens, it is neither the first nor the only activity offered by B&GCA. As Sullivan Vander Leest and Gordon note in their evaluation of technology at various Clubs, "some students come for the computers and then pick up a basketball" (2008, 14).

Intentional Learning

Youth media programs share characteristics with both Computer Clubhouses and community-based centers like Boys & Girls Clubs. Like Computer Clubhouses, youth media programs emphasize creativity and fluency in young people's uses of

digital media and technology. Like community-based programs, youth media programs aim to connect with the lived realities of young people's lives and provide resources and opportunities for learning and engagement. Youth media programs, however, are distinguishable from Computer Clubhouses and community-based centers in important ways. First, rather than offering spaces in which technology and digital media activities coexist with other forms of recreation, youth media programs are intensively and exclusively focused on media production as a pathway of youth development. Further, youth media programs tend to encourage young people to view media creation as a political act and to use the media they produce as a way to encourage and support social change. To this end, youth media programs are often designed for specific groups of young people—girls, LGBTQ youth, young people of particular racial and ethnic backgrounds, or incarcerated youth, for example—and emphasize specific social and political issues. Youth media programs often teach critical media literacy, but are not usually tied to specific academic content. And, while many youth media programs could be placed in the category of enriched learning, we have chosen to separate them out as intentional learning because of the focused nature of youth media programs as well as their independence from school-like pedagogy and content standards.

Youth media programs work to empower youth by giving them the tools and mentorship needed to make media about the issues that are important in their lives. Often existing as part of a larger organization and clustering primarily in urban areas, youth media is a unique kind of afterschool program with distinct ideological positions and pedagogical strategies. While

Box 3
Youth Radio—Converged Media in a Hybrid Youth Organization[13]

Youth Radio, located in downtown Oakland, California, self-iden-
tifies as a youth development agency and a youth media organiza-
tion. In both capacities, staff report a focus on "training": training
in the social and personal skills critical for participation in civic
life and training in the technologies and skills for careers in media
production. "You can't have one without the other," says Jacinda
Abcarian, once a student and now the executive director at Youth
Radio. "The way to have authentic rich youth media, the stuff on
the front end," Abcarian notes, is through the youth development
work that the students do on their way toward that goal.

One might argue that Youth Radio is a youth development
organization that deploys technology as a lever for recruiting,
fundraising, and programming. A blend of technology and youth
culture have been the main draw for students to enter the pro-
gram since it was founded, beginning with radio and the tools
of audio production in the 1990s and adding new media to the
mix in the 2000s. According to Abcarian, "new media and new
technology draw young people naturally," suggesting that there
is a sense with some at Youth Radio that new technology and
youth culture may be mutually reinforcing. The directors believe
that the students see Youth Radio as accentuating what they are
already doing on MySpace, which is all about getting their per-
sonal stuff out there.

Generally speaking, Youth Radio is supported by founda-
tions. Some funders are interested in media production; others
care about the educational and social services. Abcarian says that
Youth Radio feels pressure from these different interests from
funders. But from our discussions, we see that technology may
act as a hinge, enabling the organization to balance what might
otherwise be competing pressures.

While technology may be relieving some of the tensions in
funding, new media are presenting new programming challenges

Box 3
(continued)

across the two sides of the organization. As the Director of Education, Lissa Soep, explains, Youth Radio is

engaging the young people in a process where they are not just creating stories but getting the story out to audiences, and this changes the production cycle. We used to think of the cycle as preproduction, production, and postproduction. But now there's a fourth phase: participation. Keeping the conversation going. If you're going to stay in it, it's a whole new set of demands on the producers and Youth Radio to sustain that level of engagement.

This then raises youth development questions such as dealing with public inflammatory and racist comments and feedback on public Web sites in response to Youth Radio stories published on NPR. Soep wonders if and how Youth Radio can play a role in carving out "spaces of protection" within these "spaces of participation."

This dual challenge ultimately points to what Soep identifies as the larger "contradictory moment" confronting youth organizations like Youth Radio (Soep 2007) On the one hand, youth have greater and greater access to the tools for media production, access youth could once really only obtain via youth media organizations. On the other hand, with increased access to such tools has come the opportunity—if not the responsibility—of places like Youth Radio to help youth learn how to use and apply these tools, not just technically but socially.

In fact, even as youth are starting to come to Youth Radio with very uneven skills around these tools, what seem to be separating them more are not differences in technical expertise as much as in social and basic literacies (e.g., communication, writing skills). Thus, just at the moment when there could be a leveling of the playing field around access, there may be in fact be the emergence of a divide, one that might be more about a historical analog divide than about a postmodern digital divide.

youth media programming as an organizational form is relatively young, Diana Coryat and Steven Goodman (2004) note that young people have been in the practice of making media since the development of handheld video cameras in the 1960s. As noted in the Open Society Institute's Youth Media Guide for Grantmakers (Investing in Youth Media 2006), however, it is only in the past twenty years that a critical mass of youth media organizations has emerged.

Kathleen Tyner and Rhea Mokund (2003) conducted a national survey of youth media organizations on behalf of the National Alliance for Media Arts and Culture (NAMAC) and found that 59% of the participating organizations had been established in the previous five years. Clearly, youth media programs have been developed alongside the development of a robust market of consumer-grade media production tools and products. While some programs continue to focus on media making with existing tools (out of necessity, because of supply, for aesthetic or pedagogical reasons, or due to young people's interest in particular tools or styles of media making), others are more focused on acquiring newer digital technologies for production. The diversity of tools multiplied by the range of organizations has resulted in a great variety of media coming out of youth media programs—from hand written/drawn 'zines and comics to 16mm films screened at youth media festivals to digital videos and podcasts distributed online.

The penetration of technology and the diffusion of digital media production tools are often assumed to be threatening to youth media programs, since young people can increasingly make media at home on their own. To this point, Sharese Bullock and Rhea Mokund (2008) note that the relevance of youth

media programs in the age of consumer media production is a frequent question posed to youth media professionals. Coryat and Goodman argue, however, that the expansion of consumer media production has in fact been a net positive for youth media programs, resulting in better and broader distribution of their work:

Our field is affected by various globalizing forces and trends. Especially over the past decade, new media technologies have enabled our organizations, along with many other grassroots organizations, to produce broadcast-quality media, find and communicate with new audiences, and exhibit and distribute our work over the web, at rates much more affordable than in the past. The clarity of digital video and sophistication of non-linear editing programs have given young people the chance to produce polished work, enabling them to reach even broader audiences. Given the number of youth media programs, festivals, websites, cable programs, 'zines and other media outlets that actively seek out youth-produced media, there is probably more good youth media being produced now than at any other time. (2004, 1)

As Coryat and Goodman observe, then, technology and digital media are instruments of production, not forces of destruction, for youth media programs. We argue this is because youth media programs are about much more than the tools themselves. As with MOUSE, Computer Clubhouses, and B&GCA, the strength of youth media programs resides in the nontechnical aspects. The ideological context and mentorship structure, which are absent in DIY youth media practices, are key components and core influences of most youth media programs. As Bullock and Mokund write: "Youth media values the equitable balance of power between adults and the young people we serve, coupled with an inquiry-led approach, with youth voice as a guide" (2008, 2–3). It is this philosophy and culture that make

youth media an approach that is different from DIY media production, despite their similarities in terms of technological tools.

Each of the programs discussed in this section takes a different approach to afterschool learning and to digital media and technology. These approaches are derived, in large part, from the historical legacies of the programs and the ways in which each program constructs youth and understands youth development. And, while digital media and technology contribute greatly to the ways in which different organizations construct and respond to young people, as we have seen in the organizations and programs profiled above, digital media and technology are never the key, let alone the only, assets of an afterschool program. Digital media and technology may play an important role in terms of providing the infrastructure by which participants can engage resources and opportunities, or they may enable in youth to engage in certain learning and social practices. However, in every example of afterschool programs using digital media and technology, human relationships prove more fundamental to the organization than the technological tools, whether they are mentoring relationships between adult staff members and youth or as peer relationships between participants. Thus, while digital media and technology may enhance or facilitate such relationships, or may open up the possibility of participation to a larger group of people, they cannot replace the human aspects of youth development.

Libraries and Museums: Facilitating Access to Media and Culture

In many respects, public libraries and museums serve purposes similar to afterschool programs, providing young people with safe spaces and support for learning while working toward goals for learning and social participation (Downs 2007; Simone 1999; Yohalem and Pittman 2003). However, unlike many afterschool programs, which exist in spaces designated specifically for youth (such as schools or Boys and Girls Clubs), youth services in libraries and museums coexist with institutional programs and offerings for adults.

Also like afterschool programs, libraries and museums face numerous challenges in their efforts to expand their youth services in the face of digital media and technology. These include, for example, traditional structural barriers, such as limited funding and lack of qualified staffing, as well as more recent cultural hurdles, such as conflicting beliefs about what young people should and should not do with information or technology, or competing priorities around basic needs related to computer and Internet access (infrastructure) versus more social demands for technological fluency and digital media literacy (practice).

How libraries and museums overcome these more recent cultural hurdles are directly related to the ways in which they as organizations historically and contemporarily understand youth as citizens, learners, and users of media and technology.

Youth Services in Libraries and Museums

In both libraries and museums, educational programs are a subset of a larger group of youth services. Youth services librarianship has been described as "evidenced by the fulfillment of five conditions: (1) specialized collections, (2) specialized space, (3) specialized personnel, (4) specialized programs/services for youth, (5) all existing within a network of other youth services organizations and agencies" (Thomas 1982, quoted in Jenkins 2000, 104). Museum programs for young people can be said to adhere to similar conditions. Through these specialized services, libraries and museums both work toward serving the needs of young people as very particular and distinctive types of patrons, a view and a strategy that we argue stems from their organizational roots in Progressive Era educational values.

The logics of youth development also have been a strong guiding force of youth services and programming in libraries and museums. As McLaughlin (2000) outlines, four characteristics contribute to the success of youth development programming: the extent to which the program is youth-centered, knowledge-centered, assessment-centered, and community-centered.

In addition to possessing these characteristics, successful youth development programs also typically focus on the following four objectives: capacity building, partnership development, youth-driven programming, and opportunities for youth to contribute (Koke and Dierking 2007). As we have seen in afterschool programs, the youth-centered nature of these objectives is often explicit in the organizational mission, structure, and audience. Given the historical structure and culture of libraries and museums, however, such objectives must be addressed differently. In spite of the fact that youth programming is cordoned off from adult programming, young people's participation in libraries and museums can still occur via multiple and varied channels. For example, libraries must consider regular youth patrons well as occasional youth visitors or even remote youth users who access the library exclusively via online resources. Along the same lines, museums must program for children who visit occasionally with family members, students on fieldtrips, as well as young people participating in extracurricular activities onsite or online.

As Christine Jenkins has described: "The ultimate purpose of youth services programming in both school and public libraries is the promotion of reading and literacy. This goal underlies a wide range of activities, all designed to facilitate connections between young people and texts" (2000, 118). Along similar lines, Melinda Milligan and April Brayfield call attention to three organizational goals for children's programs at the museums they studied: "(1) teaching 'cultural lessons' to children; (2) teaching 'content lessons' to children; and (3) teaching 'lessons' to educators about the value and legitimacy of supplementing school curriculum with the museum programs" (2004, 281).

Thus, just as modern logics of youth development have influenced the structure of youth programs in libraries and museums, so too have the values of the Progressive Movement guided much of their orientation and approaches. For example, youth programs at museums tend to feature constructivist teaching methods associated with the Progressive Era, including "learning from and with objects, an emphasis on inquiry, the use of local material and activities, and appeal to the visitors' interests and prior experiences" (Hein 2006, 344). Similarly, Donna Gilton describes public libraries as "community information centers, informal educational centers, and cultural centers" (2008, 39), where the emphasis on community center and informal education as well as the promotion of cultural literacy directly reflect values of the Progressive Era (Jenkins 2000).

Box 4
Participatory design versus design for participation

The following is an excerpt from Anne Balsamo's post on the Futures of Learning Blog. You can access the full post here: <http://futuresoflearning.org/index.php/Firda_08/comments/learning_from_the_edges_part_2_technologies_of_participation>.

In her Museum 2.0 blog, Nina Simon distinguishes between participatory design and design for participation: "participatory design means *innovating the process*," and "design for participation means *innovating the product*." To explore the differences between these two notions, the following section describes the efforts of two noteworthy science centers: The Exploratorium in San Francisco and the San Jose Tech Museum of Innovation.

    The Exploratorium is one of the most highly regarded institutions for the creation of participatory informal science learning

Box 4
(continued)

experiences. Exploratorium staff are industry leaders in the approach to design that focuses on "innovating the product." At the Exploratorium, Karen Wilkinson and Mike Petrich have created a project called the PIE Institute that is based on their collaborative research with Mitchel Resnick from MIT. PIE (Playful Invention and Exploration) is an approach to using new technologies that integrates art, science, music, and engineering. The key elements of the PIE learning philosophy are identified as Constructionism, Hands-On Inquiry Science, Bridging Physical and Virtual Worlds, and Informal Learning.

Launched in 2005 with a workshop that explores ways to integrate digital technologies into construction-based science and art activities, the PIE Institute at the Exploratorium now sponsors multiple educational activities built around the PIE learning philosophy each year. In addition, the institute maintains an online, multimedia "Idea Library" designed to showcase interesting and innovative projects aligned with the PIE philosophy.

In comparison, the Tech Virtual Test Zone at the San Jose Tech Museum of Innovation is an example of what Nina Simon refers to as a participatory design. The Tech Virtual Test Zone is a new area in the San Jose Tech Museum of Innovation that opened on June 3, 2008. When it first opened, it showcased several hands-on, interactive exhibits conceptualized and developed originally in the virtual world of Second Life (virtual-world-to-real-world exhibits). Simon describes some of the key lessons that guided the development of this experiment in participatory design (these are 6 of her top 10):

▪ Give away the fun and easy part. Do not ask people to design whole exhibits; the Tech Virtual community contributed great ideas for exhibits.

▪ Level the playing field, or tip it in their favor.

Box 4
(continued)

- Contests are good for raising awareness and focusing behavior, but not good for building sustainable communities or work in a flexible environment.
- Provide a way for folks to build their exhibit. The participants should have tools to prototype the exhibit.
- It's more important to have social instigators lead your community than authoritative professionals.
- The community provided great inspiration, but their projects required heavy translation to become real exhibits.

As an example of a cocreated museum experience, the Tech Virtual Test Zone was an experiment in working with the public to create museum-quality exhibitions that involved the redesign of the process of exhibit design and fabrication. In this case, the exhibit design process unfolded in a virtual world, Second Life. Other museums are experimenting with the creation of dedicated physical spaces for the creation of participatory making and discovery visitor experiences.

In its 2007 report "Youth in Museums and Libraries: A Practitioner's Guide," the Institute of Museum and Library Services (IMLS) points to eight key assets that make libraries and museums valuable resource centers for youth: rich content; professional experts; validated resources; quality learning environments that "optimize and accommodate the strengths and needs of learners by offering hands-on, active opportunities for exploration, skill-building and enrichment"; leadership and apprenticeship opportunities; career mentoring; family/community connections; and digital media and technology (Downs

2007, 3–4). Despite commitments to youth development goals and to Progressive Era education values, the strategies by which libraries and museums manage and deliver these common assets do differ, of course. In this review, we are specifically interested in how libraries and museums, given their similar institutional roots but dissimilar organizational contexts, identify and integrate digital media and technology as assets into their youth programming.

In the section that follows, then, we look at several examples of how digital media and technology have been incorporated into the youth programming of libraries and museums. In no way, however, should this be considered a comprehensive survey of such initiatives. The available literature targeting the intersection of youth development, media/technology, and cultural/civic organizations is composed primarily of practitioner literature and programmatic evaluations rather than research studies, thus making it difficult to get a broad view the landscape. It is also important to note that much of this literature focuses primarily on teens rather than younger children. Teens tend to be the targeted group for many youth development interventions and, in some cases, are active participants in the design and delivery of these library and museum programs. Given these constraints, our review of the literature suggests three themes around which to discuss the state of digital media and technology for children and teens (10 to 18 years old) in libraries and museums: (1) digital media and technology as content, (2) digital media and technology as outreach, and (3) digital media and technology as a hook. As with the categories of extended, enriched, and intentional learning used to organize

the afterschool program discussion, each of these three themes reflects particular constructions of young people as learners and shapes the relationships that exist between young people and cultural institutions.

Digital Media and Technology as Content

Digital media and technology are becoming increasingly important parts of public library collections, especially collections for youth. Digital and technological assets—including, for example, the World Wide Web, online databases, and subscriptions to digital news sources—have broadened the offerings available to library patrons of all ages. Media collections, such as DVDs, audio books, and music collections, have also expanded physical and digital collections in recent years. Some libraries also circulate specialized collections of digital media, including video games. In addition to the digital media that have been added to library collections, many libraries have expanded their offerings in niche genres, such as young adult literature (e.g., Koelling 2009), comics and manga (Ching 2005; Pawuk 2002), and street lit (Hughes-Hassell and Cox 2008; Morris et al. 2006). These are all genres for which the market has exploded in the United States in just the past decade, owing in large part to increased production and distribution capabilities through technological and online processes.

For museums and libraries, this explosion of digital media and technology has both expanded and complicated the possibilities for collections. In an early investigation of technology in museums, Besser (1997) describes similarities between

the "just in time" nature of librarianship in an expanding digi-
tized information landscape and the changing nature of cura-
torship in museums. Whereas the job of librarians once was
mastery over a specific physical collection, Besser notes that in
an era of "wired" institutions, a librarian's primary responsibili-
ties are shifting to having a broad awareness of resources avail-
able at libraries throughout the country (or around the world)
and possessing the communication and research skills to acquire
whatever resources library patrons requested in a timely, cost-
effective manner. Certainly, as online resources become more
easily available and young people's literacy practices include
more multimedia, this facet of librarianship will continue to
grow and change throughout the twenty-first century.

   In their article "Bringing Technology Back In: A Critique of
the Institutionalist Perspective on Museums," Nicholas Rowland
and Fabio Rojas (2006) discuss the ways in which museum ser-
vices are enabled by different types of digital media and technol-
ogy. In purely functional terms, behind-the-scenes technologies
such as collection management systems or climate control in
galleries contribute to the type and scope of work that muse-
ums are able to do. On an operational level, digital media and
technology also contribute to defining and enabling the work
of the museum, such as directing visitor attention and defin-
ing exhibit conventions that signal the intended audience and
expected experience for a particular collection. As Rowland and
Rojas note, "Technologies allow both the largest museum and
the smallest individual collector to participate in the art world
because technologies permit the display and presentation of all
kinds of art" (2006, 89). Finally, at a cultural level, digital media

and technology offer curators the tools with which to "assert new values" (88) about the types of objects and experiences provided by museums. The legitimacy of objects, information, or narratives presented in museums is always coconstructed by the item and by the museum. Thus, simply by virtue of being included in one collection versus another, an item is imbued with a particular cultural value. Technology such as digital imaging, for example, has expanded the ways in which different art and artifacts can be included in a museum's collection, thereby altering the ways in which objects can be both experienced and valued by a museum and its audience.

Digital and technological efforts designed to extend museum objects and experiences to constituents—including young people—who were previously not a regular part of the museum audience have thus required rethinking artifact curation and exhibit participation. This has in turn led to numerous tensions in defining cultural heritage and the roles of curators. For some, extended access and expanded participation, particularly when done through digital media and technology, is seen as a threat to the traditional responsibilities of museum staff. As Maxwell L. Anderson writes in his introduction to *The Wired Museum*:

A critical issue now confronting curators—the stewards of our cultural heritage—is how to provide curious but unfocused audiences with a lens permitting a clear and faithful understanding of the work of art. This mandate is at odds with the curator's traditional responsibility: not to provide the means of understanding, but to complete the original research enabling others within and outside their institutions to grind and polish the lens. (1997, 16)

As Anderson observes, broadening participation in museums through technology shifts the responsibility for interpretation

of artifacts from curators to patrons. For some, this shift means
that digital collections must be packaged with material to guide
patrons to ensure the "clear and faithful understanding" of the
artifact or experience that curators would offer and value. But as
others like Jerry Watkins and Angelina Russo note: "Advances
in social media are now providing communities of interest with
a means to interact far more directly with museum collections,
most notably through the rise of folksonomies (user-generated
content tagging) as an alternative to fixed institutionally gen-
erated collection taxonomies. . . . If curators see folksonomy as
radical, what are they to think of far more active forms of co-
creative engagement such as digital storytelling?" (2007, 216).

Box 5
Media Workshops in Community Libraries

> *The following is an excerpt from Maura Klosterman's post on the Fu-*
> *tures of Learning Blog. You can access the full post here: <http://fu-*
> *turesoflearning.org/index.php/Firda_08/comments/digital_media_in_*
> *community_libraries_part_5_media_workshops>.*
>
> To some, it might seem like a stretch for libraries to include video
> game competitions or workshops on digital music production
> within their literacy program offerings. However, the American
> Library Association (ALA) and its Young Adult Library Services As-
> sociation (YALSA) see game programs and other media workshops
> in community libraries as a continuation of longstanding efforts
> to support literacy. Skills training with digital tools can also be
> understood as a continuation of libraries' role in teaching patrons
> information-seeking skills. Media workshops in music making,
> video editing, blogging, podcasting, and game production may
> motivate young people to visit the library for the first time, cre-

Box 5
(continued)

ating opportunities for them to learn about the wide variety of services the library can offer. The ALA and YALSA provide guidelines for ways librarians can utilize free software programs and platforms to create workshops and resources for young people to produce media content from blogs to short films.

Beginning in 2005, The YALSA has sponsored an annual "Teen Tech Week," during which libraries highlight opportunities for using digital media at the library. While many Teen Tech Week activities are based around video games and consoles, library programs have included digital photography workshops and video creation activities. Beyond Teen Tech Week, however, many libraries run ongoing digital media workshops. For example:

▪ The Carvers Bay Digital Arts Experience (DAE) is a collective effort of the Georgetown County Library System and the Cultural Council of Georgetown County (South Carolina), with funding from the Gaylord & Dorothy Donnelly Foundation and the Francis P. Bunnelle Foundation. The twelve-week course was designed to expose middle school students to the basic concepts and skills required to complete digitally oriented audiovisual projects.

▪ As part of ALA's Libraries, Gaming, and Literacy Initiative funded by the Verizon Foundation, ten libraries nationwide received grants to implement creative game design and gaming programs.

▪ The San Pablo Library of California's Contra Costa County Library System received a grant to implement a music literacy program called Make Music at the San Pablo Library. Planned activities range from assemblies and performances to workshops teaching digital music production, to game nights featuring music-based games such as *Rock Band* and *Wii Music.*

▪ The South Orange Public Library in South Orange, New Jersey, hosted a three-part poetry video workshop run by a local poet and

Box 5
(continued)

video teacher. Funded by the Edison Media Arts Consortium, the workshops led participants through creative writing, filming, and editing processes. The library also hosted a night that featured a screening of all the videos.

▪ The Metropolitan Library Service Agency of the Twin Cities region in Minnesota will be sponsoring video workshops as part of its "Quiet on the Set" competition this summer, in which people are invited to create short videos about local libraries.

▪ The Pioneer Library System in Pottawatomie County, Oklahoma, is partnering with a local video teacher to hold videography workshops in several branches this June. The two-hour workshops are meant to take small groups through pre-production, filming, and editing steps. The events are part of the library system's "Express Yourself" Summer Reading Program and are sponsored by the Oklahoma Arts Council.

These digital media production activities are just some of many examples of libraries' efforts to expand the range of library services they offer to users as well as efforts to meet the expanding media needs of young library users.

The concept of technology as legitimizing the inclusion and extension of new objects, works of art, or information in museums is a useful frame for thinking about the relationship between technologies and youth participation in libraries and museums. As libraries and museums work to serve larger numbers of young patrons, digital media and technology seem to offer ways to expand their collections with the kinds of information, artifacts, and media that young people need and in the ways that they

want. In this way, assumptions about youth as "digital natives" (Prensky 2001) as well as beliefs about the potential of cyber-learning tools have together created organizational pressures to incorporate digital media and technology into their youth programming. Digital media and technology as content for youth can take many forms in libraries and museums. For example, at the local level, digital media and technology initiatives commonly found in libraries include movie nights (Fry 2008), media production activities (Mulligan, Kelsey, and Davis 2007), video game jams (Neiburger and Gullett 2007; Nicholson, 2009; Welch 2008), and fan-related events such as cosplay and conventions (Brehm-Heeger, Conway, and Vale 2007). At the national level, there are emerging programs like Teen Tech Week, which is a new annual event of the American Library Association's (ALA) division for teen librarians, Young Adult Library Services Association (YALSA). YALSA launched Teen Tech Week in 2007 with the purpose of "empowering teens to become competent and ethical users of emerging technologies" (Iser and Wilk 2008, 16). The ALA provides grants, program materials, and guides for implementing programs that promote the technological infrastructure of the library while also instructing teens in critical media practices. For example, Teen Tech Week supports programs that provide basic lessons on copyright law while teaching teens to record music using software such as *Audacity* or *Garage Band* (Hoeffgen 2009; Iser and Wilk 2008). Within museums, common examples of digital media and technology aimed at youth involve multimedia exhibits (Blair 2009), museum education programs about science and technology (Carroll 2008), and museum Web sites offering extension activities and educational resources (see box 6).

In addition to posing considerable funding and staffing challenges, especially in a troubled economy (Wooden 2006), experimental programs built around digital natives and cyberlearning tools introduce new conflicts over what materials and resources young people need and should be able to access. Increased access to information through digital media and technology, on the one hand, presents numerous channels for young people to learn more about the world than ever before. On the other hand, the vast amount of information broadcast through these channels (particularly the Internet) poses a challenge to established understandings of needing to protect childhood innocence by providing systems of control that operate through parents and institutions as gatekeepers (Buckingham 2000). For example, libraries must juggle contemporary requirements to monitor and filter the Internet activities of minors per the Children's Internet Protection Act (CIPA) (Jaeger, Bertot, and McClure 2004) with their longstanding library missions to facilitate information access and encourage literacy.

Digital Media and Technology as Outreach

Historically, libraries and museums uphold common goals when it comes to youth outreach: educating the public and cultivating life-long patrons. Their organizational approaches to youth outreach have also been similar in many ways over time—both offer specialized spaces, staff, and collections as part of their youth programming. And, increasingly, both libraries and museums are integrating digital media and technology into their programming for outreach purposes, albeit in different ways.

Many media and technology-based outreach efforts in libraries have focused on ameliorating the digital divide and closing the education gap through the adoption of technological infrastructure and the provision of computer and Internet access. A handful of studies on young people's use of public libraries suggest that this is the most useful strategy to incorporating technology, as youth (particularly teens) tend to use the library and its resources primarily for school assignments (Agosto 2007; Cook, Parker, and Pettijohn 2005). But, of course, young people can and do participate in library communities in a variety of ways. Thus, these more instrumental uses of the library by youth are often accompanied by what might be considered more social uses of the library. Many libraries offer multiple options for this type of engagement, including Teen Advisory Groups, onsite volunteering, and fundraising activities. While opportunities for social participation vary between libraries, outreach related to these opportunities has become consistently more visible across libraries through digital media and technology. For example, Teen Advisory Groups (TAGs) are found in most libraries and have the common goal to "engage and empower teens in the process of making their libraries better and more interesting places for them" (Asis 2006, 26) through contributions to and publications about library events. Some TAGs run book discussion groups, write reviews of new books in the collection, compile recommended reading lists, or contribute ideas about teen programming. And, as Asis notes, today, much of this activity is published and broadcast via the library Web site.

The importance of specialized staff to serve young adults in libraries was consistently emphasized in much of the literature

we reviewed (Casey and Stephens 2008; Gilton 2008; Hughes-Hassell and Cox 2008). In a digital age, the work of youth librarians involves not only knowing which media and technology that are important to young people but also the willingness to value how youth engage that media and technology—if not for their own merits, at least as a pathway to other types of materials and literacies. While this appreciation for both content and practice may not be a radical departure for some librarians, it requires a shift in attitude away from entrenched systems that define certain materials as more worthwhile than others.

By comparison to libraries, it seems that museums tend to incorporate digital media and technology into their outreach strategies in more peripheral ways than do libraries, at least onsite. For example, as Deborah Schwartz (2005) notes, youth-oriented outreach programs that either extend technological infrastructure or encourage digital media practices are surprisingly rare inside museums. She describes two exceptions: the Bronx Museum's Media Lab and the Museum of Modern Art's Red Studio, both of which provide innovative opportunities for teens to make media using a variety of interactive and media production tools. The value of these programs should not be attributed solely to the ways in which they incorporate digital media and technology but rather the opportunities they offer for youth participation. Schwartz describes the programs at the MoMA and Bronx Museum as "something of a laboratory for teens" (2005, 3) because of their innovative and immersive approaches to teen participation. Teens are invited not only to visit the museum but to participate in transforming it into something they find interesting and representative of their own experiences. Digital

media and technology are new resources for these spaces and are
likely to become more prevalent and integral to youth participa-
tion over time as curators become more comfortable with the
tools and the practices.

Box 6
Online (Art) Museum Experiences

*The following is an excerpt from Susana Smith Bautista's post on the
Futures of Learning Blog. You can access the full post here: <http://
futuresoflearning.org/index.php/Firda_08/comments/online_art_mu-
seum_experiences>.*

Games have long been offered by museums inside the galleries,
usually targeting youth with old-fashioned scavenger hunts or
even interactive digital games on computer kiosks. Games are
now being incorporated into cell phone audio tours in some mu-
seums. With the popularization of the Internet and the develop-
ment of Web 2.0 technologies that facilitate participation and col-
laboration, museums have also begun to incorporate games into
their Web sites, again targeting youth (also through parents and
educators). Another reason for museums to engage online games
is to compete with the torrent of highly visual entertainment ac-
tivities now readily available such as console games, reality televi-
sion, anime, virtual reality, and interactive computer games such
as MMORPGs (massively multiplayer online role-playing games).
Museums utilize games in the service of education. These enter-
tainment-based learning tools—*infotainment* or *edutainment*—of-
fer an important opportunity for learning that is social and fun,
both integral to how youth experience art.
    While scavenger hunts continue to be used for kids inside the
galleries, they are also popular with adults, especially the new
multimedia version that utilizes third-party sites and mobile

Box 6
(continued)

technologies. The best example of this is the well-known Ghosts of a Chance (<http://ghostsofachance.com>) at the Smithsonian American Art Museum (July 8–October 25, 2008), the first alternative reality game (ARG) hosted by a museum. Over 6,000 players participated online, and 244 people came for the final onsite event at the museum. Multimedia platforms included Flickr, MySpace, Facebook, YouTube, the museum's blog Eye Level, text messaging on mobile phones, as well as exploration of the physical museum. According to the museum's final report on the game, the museum was successful in achieving two of its goals: to raise awareness of the museum and to encourage discovery. The third goal, bringing new visitors to the museum, was only partially achieved. Although the museum did not experience many new visitors to the physical site of the museum, they did see significantly increased traffic on their Web site, indicating an increase in online visitors.

Another example of a museum expertly incorporating games—and much more—into the museum experience is the J. Paul Getty Museum's presence in Whyville.net, an educational virtual world for teens and pre-teens. In 2005, the Getty Museum became the first cultural organization to partner with Whyville, adding their arts content to the site. Other museums have since established a presence in Whyville, including the Field Museum of Chicago. In a 2005 Getty press release, Peggy Fogelman, assistant director and head of education and interpretive programs at the museum stated,

At the virtual Getty Museum, kids can explore our collections on their own terms. By making art fun and familiar, we hope that Whyvillians will venture beyond their computer monitors into art galleries and museums in their hometowns, and to the Getty Center when they visit Los Angeles. We want them to make art a part of their virtual as well as real lives.[14]

Box 6
(continued)

The Getty Museum in Whyville, located in the town square, offers games such as Art Treasure Hunt, and ArtSets Gallery, and Art Hour conversations, which is like a chat room for Whyvilleans.

Both examples presented here, Ghosts of a Chance at the Smithsonian and the Getty Museum in Whyville, illustrate how museums have approached digital media as content, as a way to facilitate outreach to the larger community, and as a hook to motivate youth participation in service of cultivating life-long museum patrons.

Museums seem to be making better use of online spaces, as compared to onsite spaces, to incorporate digital media and technology into youth outreach. In this vein, Justin Heideman and Witt Siasoco describe the process by which the Walker Art Center, a leader in the museum world for innovative teen programming, turned its Web site into a compelling space for teen participation by creating "an architectural framework that satisfies both the high design aesthetic of the Walker and the kitschy look of MySpace"(2008, 1). The "business side" of the Web site offers visitors brochure-like information about the museum, including location, hours, staff directory, and so on. The "fun side" of the Web site presents Web 2.0 spaces and tools that teens use in their everyday digital practices, including a blog that can accommodate text and links to video, a Web listing for upcoming events, and a collection of shared links.

Thus, while Web sites directed at young people are becoming more commonplace forms of outreach for both museums and

libraries, it is worth noting the different ways in which these organizations are using these sites and what this difference suggests about their relationships to youth. Libraries tend to host blogs or Web sites for their teen constituents in order to disseminate information about library events, post reviews of new books, provide homework and reference assistance.[15] For libraries, maintaining a Web site for young patrons is a way to extend their reach by making resources available to youth wherever they are and whenever they need them.

Museums, on the other hand, tend to use their Web sites to provide resources such as curricular guides for teachers, multimedia presentations for parents, and educational games for kids. All these resources are meant for consumption in the home or at school but, in many if not most cases, directly in preparation for visits to the museum. For example, the Museum Kids section of the Web site for the Metropolitan Museum of Art features a number of multimedia activities for children. Ranging from coloring pages for printing to videos, these activities are linked to the artwork in the museum and provide opportunities for a pre-visit preparation or post-visit extension of the experience at the museum. The Getty Center in Los Angeles offers on its Web site an extensive catalog of resources for teachers and families, including instructions for art projects and a number of Web-based games. In addition, the Getty Center has a "virtual companion" in Whyville,[16] a virtual world designed for preteens, where young people can chat with friends, play games, create simple artwork, and learn about art history. Thus, it might be said that while libraries seem to incorporate digital media and technology into their outreach strategies, whether onsite or online, as a way to extend their resources to youth, museums

seem to integrate digital media and technology to enhance the museum culture for youth.

Digital Media and Technology as a Hook

Jerry Watkins and Angelina Russo have described libraries and museums as "hubs for formal and informal communities of interest" (2007, 213). These communities of interest are, in part, structured around the collections, exhibits, and educational programs onsite. The authors also suggest "that digital media such as blogs, wikis, and digital stories may provide a solution for cultural institutions wishing to interact with communities and audiences in more creative and lasting ways" (2007, 213). Just as with afterschool programs, however, digital media and technology are not the only reason for nor the primary means of participation in libraries and museums. They are, however, an important tool for attracting new participants to and connecting them around communities of interest. It is then the combination of technologies, resources, and personal relationships that generates and supports ongoing participation in the organization.

A recent movement within public libraries, prompted in large part again by the efforts of YALSA, encourages libraries to use digital media and technology as a hook for drawing teens into the library. In these efforts, teens are consciously or unconsciously being framed as "digital natives" (Prensky 2001) with everyday needs for computer, Internet, and media access related to education, communication, and entertainment. In turn, libraries are being increasingly reframed as "information gateways" and "entertainment spaces" for youth (Agosto 2007). Efforts to

entice teens into the library through technology-based programs include video game nights, popular culture events (e.g., *Guitar Hero* extravaganzas, *Harry Potter* parties, anime clubs), or use of Web 2.0 technologies (e.g., social network sites, blogs, and virtual worlds). The operating assumption behind these hooks is that if young people are introduced to the library as teenagers and develop a positive association between the library services and their needs, they will grow into active adult patrons (and possibly benefactors) of the library in the future. As Michael Casey and Michael Stephens argue in an article called the "Transparent Library," "If we don't get them in as kids and keep them as teens, we likely won't see them later in life" (2008, 28).

Sherry Cook, Stephen Parker, and Charles Pettijohn have emphasized that, if libraries are really going to become more relevant in young people's lives, however, "it will require the library to focus more on the social aspects of a teen's life rather than simply helping them with their homework" (2005, 160). Following this advice, increasingly libraries are also trying to hook youth by providing comfortable spaces customized for children and teens, where they can not only access the library's collections but also "hang out" and "mess around" (Ito et al. 2009). The types of newer youth spaces—such as YouMedia @ CPL—are often separated from the rest of the library, exempting teens (to an extent) from the requirements for quiet, independent work that are typical in library spaces (Agosto 2007). Along with the Chicago Public Library, other libraries such as the Burton Barr Phoenix Central Teen Library, Des Plaines Public Library, and the Harris County Public Library have also recently implemented changes to furniture, hardware, and policies in spaces for teens. Long tables have been outfitted with outlets

and Ethernet ports; laptops can be checked out; beanbag chairs have been provided for lounging and group work; and areas have configured for watching television, movies, or live performances. Bright paint and unique artwork complete the work of setting the tone in some of the teen rooms, reinforcing the separation of the teen spaces from the rest of the library (Booth 2006).

Box 7
YouMedia @ Chicago Public Library

YouMedia @ CPL is an innovative, twenty-first-century learning space housed at the Harold Washington Library in downtown Chicago. The program was created to connect young adults, books, media, and institutions throughout the city in one dynamic space designed to inspire collaboration and creativity. By working both in teams and individually, young adults engage in projects that promote critical thinking, creativity, and skill building.

The design of Chicago Public Library's YouMedia is based on the research of Professor Mizuko Ito and colleagues (Ito et al. 2008, 2009). This ethnographic study of more than 700 youth found that youth participate with digital media in three ways: (1) they "hang out" with friends in social spaces such as Facebook and MySpace; (2) they "mess around" or tinker with digital media, making simple videos, playing online games, or posting pictures in Flickr; and (3) they "geek out" in online groups that facilitate exploration of their core interests. In these groups they may, for example, make things like rap music, documentaries, machinima, or robots. They may also be committed writers on fan fiction and anime sites. Ito et al. found that these online interest-driven activities extend young people's learning and exploration significantly beyond experiences in school or local community programs.

Box 7
(continued)

The goal of YouMedia is to support youth participation with digital media across all three of these practices. The goal, in time, is to increase substantially the number of youth in Chicago who use online resources and new media as tools to engage in inquiry about their neighborhoods, the city, and the world. The design of the YouMedia learning space encourages individual and collaborative work and is a safe and open space where teens can come just to hang out.

While "hanging out" with friends may be the hook that brings young people into the library, the space is designed explicitly to facilitate the movement of young people into deeper and more complex engagement in learning. YouMedia has been explicitly designed support young people's movement from hanging out to messing around and ultimately to geeking out with digital media and books. The areas within YouMedia hold different activities to create a continuum of learning based on ever-changing themes and literature-based curriculum developed by the Library and its partners. Young people engage in making and producing digital artifacts such as hip hop songs, fan fiction, games, and virtual worlds grounded in the content of books.

YouMedia also extends beyond the library walls to exist virtually—providing an online community where students can create, display and exchange ideas about their work with peers and adult mentors. Youth have the opportunity to create an online portfolio of work that can then be connected to and shared with other institutions and initiatives.

While the focus of the design of YouMedia has been on supporting youth in out-of-school time, teachers with classes of students can also reserve the space for skill-building workshops, book discussions, and digital projects during the school day.

Youth-centered library spaces have also been created online through the use of social network sites and virtual worlds such as Second Life. As Kelly Czarnecki (2008a; 2008b) describes, these virtual spaces can serve as effective hooks for youth, helping them to build communities of interest and offering them opportunities to share information and creative work with the support of the library resources. In this vein, some library systems ventured onto the (now defunct) Teen Second Life (TSL) grid by purchasing an island where they can run educational programming and where youth participants can socialize. Other libraries have used social network sites such as MySpace and Facebook to create virtual spaces through which young people can participate in the community via online discussions, information sharing, or media swapping (Oleck 2007).

Like libraries, museums view children as both a current and future group of visitors and learners to be captured. As Melinda Milligan and April Brayfield note, museums also know that to "expand their pool of potential future visitors beyond those already inclined to attend, museums often turn to educational programs for children, due to the belief that children who attend museums are more likely to return as adults" (2004, 278). Museums, however, face a number of challenges in using digital media and technology as hooks that are different from those faced by libraries. Unlike libraries, which are often understood by young people and families as a type of community center specific to a neighborhood, museums generally aim to serve people from a much wider and more diverse geographic area. Further, unlike libraries, which carry a variety of resources related to different interests, museums are often highly specialized, focused on specific types of content—art, science, automobiles, and so on.

Of course just as libraries, museums use digital media and technology in education to hook youth and drive visits to museums. As was already implied, however, apart from children's science and technology museums, museums generally do not integrate technological infrastructure like computers but rather incorporate digital media experiences such as simulations. For example, the Digging Deeper Gallery at the Kidspace Children's Museum in Pasadena, California, simulates natural environments (such as an archaeological dig site) and encourages visitors to take on the identity of a scientist in order to uncover information about bugs, rocks, and fossils. And, on a similar theme, New York City–based Global Kids, the Field Museum of Chicago, and the Biodiversity Synthesis Center worked together to organize the "I Dig Tanzania" virtual summer camp. While the scientists were conducting their work in southwestern Tanzania, kids performed a virtual fossil excavation of their own in the virtual world Teen Second Life. In both cases, technology and media were used to support children's learning while also reinforcing museums as engaging places for exploration.

As we have seen with afterschool programs, digital media and technology are increasingly important components of youth programming in libraries and museums. And, while both organizations recognize the importance of digital media and technology in young people's lives, libraries and museums have assigned different values to digital media and technology and have taken different approaches to integrating them into their programming. We believe these organizational differences in terms of strategy are based on conceptual differences in their understandings of youth that are reinforcing their relational differences to the social lives and learning ecologies of youth today.

Conclusion: From a Fragmented Field to a Learning Ecology

Like Dewey and his Progressive Era colleagues, we believe that learning is not—nor should be—confined to the classroom (Berube 1995; Dewey 1915/2001; Zilversmit 1993). Further, we have argued that many afterschool programs and youth programs in museums and libraries are attempting to use digital media and technology as ways to extend, enrich, and encourage learning. Through these efforts, we believe that youth programs in educational, civic, and cultural organizations are making important contributions to the continued development of robust learning ecologies for young people.

The concept of learning ecologies initially emerged from ecological theories of child development, which emphasize the importance of children's interactions at different levels and in different contexts (Bronfenbrenner 1979). The notion of learning ecologies has been extended beyond its roots in development to consider connections between contexts and resources for learning, including digital media and technology. Brigid Barron defines learning ecologies as "the accessed set of contexts, comprised of configurations of activities, material resources and

relationships, found in co-located physical or virtual spaces that provide opportunities for learning" (2004, 6). Likewise, our vision of a learning ecology does not imply the creation of a new, highly structured system of education. Rather, it invites the fertilization of diverse resources that together multiply and improve the educational opportunities and learning trajectories available to youth. Our motivation behind conceptualizing a learning ecology in this way is not simply to coordinate existing youth services around learning and socialization, but rather to enrich youth engagement with youth organizations through easier identification, better coordination, and strategic customization. Admittedly, these are lofty ambitions, but so too were the original missions of afterschool programs, libraries and museums when founded.

School reform leaders such as John Goodlad have argued the importance of an ecological approach to education for many years:

> The school is not and cannot be . . . the exclusive provider in a community's educational system. . . . The school may be the only institution charged exclusively with the educational function, but the ability and responsibility of others to educate is recognized and cultivated. There is not one agency, but an ecology of institutions educating—school, home, places of worship, television, press, museums, libraries, businesses, factories, and more. (Goodlad 1984, 350)

As Goodlad notes, learning always happens within an ecology of institutions, even when those institutions are not specifically designed for education. Similarly, Kirsten Ellenbogen posits museums as part of a cadre of educational resources. She highlights the contestation that occurs around legitimizing organizations' educational functions and values:

Museums are just one of many resources for learning that include other institutions (e.g., libraries and schools), organizations (e.g., community, church, and scouting groups), and media (e.g., books, newspapers, magazines, television, film, radio, and the Internet). However, the actual position of museums within the multilayered educational infrastructure, and the very nature of the museum as a learning environment is contested. (2002, 82)

Such debates over the legitimization of different institutions within learning ecologies are further evidence of the claim made in the introduction to this report regarding the fragmentation and loose ties that characterize the field of educational, cultural, and civic organizations.

As we have discussed at length in earlier sections of this report, digital media and technology have strong presences in contemporary learning ecologies, both as institutions in and of themselves and as infrastructural elements and content of other organizations. Through this review, it is evident that digital media and technology present great opportunities and challenges to youth organizations. Indeed, digital media can offer opportunities for both self-directed and collaborative learning, can open access to information that might not otherwise be accessible, and can allow for creative expression in new formats. However, in each of the organizational types surveyed in this report, we have seen that the nontechnical aspects of youth programs—the location and context, the staff and peers—are essential to the function and success of youth organizations, even in the land of digital natives and the age of cyberlearning.

Recommendations for Future Research

We conclude our review by suggesting three areas that we believe should shape the immediate research agenda within the field of Digital Media and Learning. First, as we have suggested, much of the literature (apart from the programmatic evaluation research) surrounding digital media and technology is based largely on anecdote. As a consequence, and as is often the case in early stages of field development, the literature is overrepresented by work that is "pro" digital media and learning and work that is "anti" digital media and learning. In order to fully assess the challenges and the opportunities for digital and technologically enabled learning ecologies, more empirical, methodologically sound studies are needed to better understand the affordances of digital media for learning within, between, and beyond youth programs. The Digital Youth Project (Ito et al. 2008; 2009) is a strong example of such work in the qualitative/ethnographic genre. The Digital Youth Project, however, was just a first step toward better understanding youth digital media practices. Being built on this foundation, future research could take a variety of forms, including survey research, social

network analysis, and longitudinal analyses of the relationships between access, engagement, and learning. Researching within gray areas of digital media practice—that is, looking for the subtle aspects that make particular practices meaningful learning experiences—can lead away from polemics on the virtues or horrors of digital media.

Second, as this review reveals, there is a need for additional research focused on the relationship between digital media and technology, on the one hand, and the question of organizational change and the effectiveness of youth services, on the other. Developing a shared language for evaluation will be important in helping organizations connect, share resources, and learn from one another—that is, in helping institutions to position themselves within learning ecologies. The MacArthur Foundation has begun to fund preliminary research on this topic at the institutional level in New York and Chicago. Initial questions in this area include: What services and opportunities are organizations providing within specific communities? How might organizational practices change if a formal network of institutions was instituted and supported with digital media and technology? What would such a network look like? What impacts might such a network have on youth learning and participation? How do we measure its success?

Finally, there is a need to address the position of schools within learning ecologies. While we agree with Goodlad that schools are not (and should not be) understood as the only legitimate institution in an educational system, we do acknowledge that schools continue to act as gatekeepers of information and cultural capital and, for most youth, are an inevitable node in

their learning ecology. We also acknowledge that, like the organizations profiled in this report, schools have made efforts to integrate digital media and technology in instruction and everyday school activities and that schools struggle with many of the same issues identified by libraries, museums, and afterschool programs. Further research is needed to understand the spaces of overlap between school-based initiatives in digital media and technology and the efforts of organizations. How can best practices in each organization contribute to a more coherent approach between organizations?

Notes

1. For the purposes of this review, we use the phrase "digital media and technology" to refer to an overarching category of diverse elements. Although we use this general phrase in order to save time and space, we recognize that not all digital media and technology are the same. Future research should be careful to disentangle these broad terms and attend to the differences and nuances of the elements within.

2. This account of 826 Valencia includes information from an interview with Nínive Calegari, cofounder of 826 Valencia and CEO of 826 National, conducted on December 17, 2008.

3. For the purposes of this paper, we distinguish between afterschool programs and extracurricular activities and focus our review on the former. As we explain in more depth in the text box on the following page, we see important differences in the kinds of experiences and purposes of afterschool programs, usually offered through public agencies to promote youth development, and extracurricular activities, usually offered by private companies for enrichment. While both types of experiences can be valuable for young people, we highlight the work of afterschool programs rather than extracurricular activities because of afterschool programs' closer alignment with the history and goals of progressive education and our belief that the market alone should not determine youths' opportunities to use digital media and technology.

4. ISTE National Educational Technology Standards (NETS) are available at http://www.iste.org/AM/Template.cfm?Section=NETS . The Partnership for 21st Century Skills Standards are available at http://www.21stcenturyskills.org/index.php?option=com_content&task=view&id=254&Itemid=120 .

5. http://www.whitehouse.gov/the_press_office/Fact-Sheet-A -Historic-Commitment-To-Research-And-Education .

6. http://www.intel.com/education/ISEF .

7. http://soinc.org/about .

8. http://usfirst.org .

9. http://imaginecup.com .

10. http://www.mouse.org .

11. http://www.computerclubhouse.org/content/clubhouse-history .

12. http://myclubmylife.com .

13. This account of Youth Radio is primarily based on: interviews with Ellin O'Leary, Chief Content Officer and President, on April 15, and April 17, 2009; an interview with Jacinda Abcarian, Executive Director, on April 15, 2009; an interview with Lissa Soep, Senior Producer and Education Director, on April 23, 2009, with a follow-up conversation on October 20, 2009; and an interview and tour of Youth Radio with Erik Sakamoto, Director of Youth Programs, on April 27, 2009.

14. http://www.whyville/press/news_from_getty.pdf .

15. See, for example, "Evolver" (http://teens.denverlibrary.org) and "Push to Talk" (http://blog.spl.org/yablog)).

16. http://www.whyville.net/smmk/top/gates?source=getty ; http://www.getty.edu/news/press/educate/whyville2005.html .

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