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Recommended Citation

Eric D. M. Johnson, (2016), The Right Place at the Right Time: Creative Spaces in Libraries, in Samantha Schmehl Hines, Kathryn Moore Crowe (ed.) *The Future of Library Space (Advances in Library Administration and Organization, Volume 36)* Emerald Group Publishing Limited, pp.1 - 35

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The Right Place at the Right Time: Creative Spaces in Libraries

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This is a reformatted pre-print version of this chapter. The final version of record can be found at:

Eric D. M. Johnson, (2016), The Right Place at the Right Time: Creative Spaces in Libraries, in Samantha Schmehl Hines, Kathryn Moore Crowe (ed.) *The Future of Library Space (Advances in Library Administration and Organization, Volume 36)* Emerald Group Publishing Limited, pp.1 - 35

DOI: 10.1108/S0732-067120160000036001

Abstract

Purpose

This essay explores the recent trend in libraries: that of the establishment of spaces specifically set aside for creative work. The rise of these dedicated creative spaces is owed to a confluence of factors that happen to be finding their expression together in recent years. This essay examines the history of these spaces and explores the factors that gave rise to them and will fuel them moving forward.

Design/Methodology/Approach

A viewpoint piece, this essay combines historical research and historical/comparative analyses to examine the ways by which libraries have supported creative work in the past and how they may continue to do so into the 21st century.

Findings

The key threads brought together include a societal recognition of the value of creativity and related skills and attributes; the philosophies, values, and missions of libraries in both their longstanding forms and in recent evolutions; the rise of participatory culture as a result of inexpensive technologies; improved means to build community and share results of efforts; and library experience and historical practice in matters related to creativity. The chapter concludes with advice for those interested in the establishment of such spaces, grounding those reflections in the author's experiences in developing a new creative space at Virginia Commonwealth University.

Originality/value

While a number of pieces have been written that discuss the practicalities of developing certain kinds of creative spaces, very little has been written that situates these spaces in larger social and library professional contexts; this essay begins to fill that gap.

Keywords: creativity, library spaces, makerspaces, media centers

The Right Place at the Right Time: Creative Spaces in Libraries

*“It is not enough to be in the right place at the right time.
You should also have an open mind at the right time.”
–Paul Erdős*

*And see the confluence of dreams
That clashed together in our night,
One river born of many streams
Roll in one blaze of blinding light!
–George William Russell*

The first decade or so of the twenty-first century has seen a new trend emerging in public, school, and academic libraries, one that is poised to thrive over the next decade or so to come: that of the establishment of spaces specifically set aside for creative work. These spaces may take different shapes depending on the library in question. Some focus specifically on media creation in its essential audio-visual forms: they provide hardware and software to users who wish to create and edit audio or visual works. Others dive wholeheartedly into the maker movement with dedicated makerspaces or Fab Labs offering a set of creative tools that give users the opportunity to get their hands on shared tools ranging from screen printing, pottery wheels, drill presses, and sewing machines to the emerging technologies of 3D printing, tabletop CNC machines, and programmable microcontrollers. Still others, most often found as digital history and digital scholarship centers in academic libraries, provide places where coding and the creation of digital tools and apps is the primary focus. Yet others blend elements of each of these into a stew unique to the particular institution.

Though it may seem—not least of all from sometimes-breathless reporting in popular and professional literature—that creative spaces in libraries have suddenly sprung forth into the library scene like Athena wholly grown and armored from the forehead of Zeus, the truth is they have roots set firmly in library and community history, drawing sustenance from a number of wells ranging from ancient human practice to children and teen librarianship to demonstrated community needs to shop class to 1970s

microcomputers. It will be argued here that it is in part due to those very connections and several other library-related strands that creative spaces feel—and are—“right” in library settings.

More than anything else, the rise of these dedicated creative spaces in libraries owes itself to a confluence of factors that happen to be finding their expression at the same time in the early twenty-first century. The key threads being spun together in this chapter include a recognition at a societal level of the value of creativity and related skills and attributes as being of benefit as we move more deeply into the century; the philosophies, values, and missions of libraries in both their longstanding forms and in recent evolutions; the rise of participatory culture as a result of inexpensive technologies and improved means to build community and share results of efforts (i.e., the influence of the Internet); and library experience and historical practice in matters related to creativity, an experience and history which means libraries need never shy from embracing these new developments, since we have been here before.

Aside from support of the written word (Bonn & Furlough, 2015; Elmborg & Hook, 2005), until recent years it has not been readily possible for libraries to support creative effort programmatically or at scale. In more than a century of modern libraries, most of the focus has been on making information resources and services across a range of media available in support of the *consumption* of content rather than its *creation*. Now, with falling prices, increased ease of use, supportive communities of users, and expanded familiarity with both the products and processes of creative endeavors, library creative spaces are now both socially and fiscally responsible.

The spaces discussed in this chapter exist primarily to support creativity in one or more forms. They are appropriate in libraries because the kinds of creativity they support are at heart about the integration of information (that is, knowledge creation) and the sharing of the same. The ideas aren't new—as will be described below, some have been connected to libraries for quite some time—but the forms, spaces, and technologies are. Libraries need to keep making space for creativity.

What Is Meant by Library Creative Spaces

The term “library creative spaces” is used here to encompass a number of different kinds of library services spaces that focus wholly or in part on content creation as opposed to content consumption alone. Recognizing that under this definition, the entire library could be considered a creative space—as indeed it is—the term here is used specifically to refer to spaces that are explicitly set aside within a library to focus on the creation of *non-textual content*, which could include drawings and photographs, audio materials, videos, three-dimensional objects (whether handmade or 3D printed), programmed electronic devices, computer coding and other programming, web-based multimedia, and more.

Such spaces typically will offer: 1.) dedicated space, 2.) tools, materials, and equipment for use by patrons, and 3.) some level of support, whether in the form of staff

expertise and facilitation, classes and instruction, online resources, or some combination of those. They are typically open to the entire constituency of the library.

By this definition, the makerspace certainly qualifies as a creative space. At the Library as Incubator Project blog, makerspaces are defined this way:

Makerspaces are collaborative learning environments where people come together to share materials and learn new skills. . . . not necessarily born out of a specific set of materials or spaces, but rather a mindset of community partnership, collaboration, and creation. A perfect match for public libraries! (Jones, 2012)

Another modern library-based creative space is the media center, media services center, digital media center, or other designated space dedicated to the use of media creation tools for the creation and sharing of knowledge. Such spaces might include cameras, video recorders, audio recorders, production studios, sound booths, and hardware and software associated with creating, editing, and distributing graphics, recordings, and other media products. Some of these tools might circulate (e.g. cameras and audio recorders) while others are used only in-house (Vallier, 2010).

A related kind of center often found in academic libraries is the digital humanities center, or as is sometimes found on some campuses, a more broadly cross-disciplinary digital scholarship center. Writing for the Council on Library and Information Resources, Diane Zorich (2008) defined digital humanities centers as “an entity where new media and technologies are used for humanities-based research, teaching, and intellectual engagement and experimentation.” Creative activities in such centers might include building digital collections; creating tools for authoring, building digital collections, analysis of collections or data or research processes, or managing the research process; generating new intellectual products; and creating a place of experimentation and innovation for humanists (Zorich, 2008).

While the efforts of such centers might ultimately serve a wider constituency (e.g. the entire academic community and the general public), because their services and resources are often focused on a smaller and more specialized population or need (e.g. faculty or graduate students or people interested in GIS), some such digital scholarship centers might be considered as not being quite the same kind of generally-accessible creative space as is the focus of this chapter. That being said, the borders of any given library-related creative efforts are extremely fuzzy and all-encompassing, so much of what is said here applies equally to these centers and many others.

Creativity Defined

Before diving much further, it might be useful to briefly examine definitions of creativity. R. Keith Sawyer, the Morgan Distinguished Professor in Educational Innovations at the University of North Carolina in Chapel Hill, observes (2012) that “defining creativity may

be one of the most difficult tasks facing the social sciences.” (p. 7). The two major traditions of creativity research have resulted in two different approaches to the field: an individualist approach and a sociocultural one. Each offers a slightly different definition.

The individualist definition is “Creativity is a new mental combination that is expressed in the world.” It may be that the combination in question introduces nothing new in the world, but so long as it is new to the individual in question, the definition is satisfied. Creativity researchers call this “little c” creativity. (Sawyer, 2012, pp. 7-8)

The sociocultural definition is “Creativity is the generation of a product that is judged to be novel and also to be appropriate, useful, or valuable by a suitably knowledgeable social group.” By this definition, “[o]nly solutions to extremely difficult problems, or significant works of genius, are recognized as creative.” This approach is called “big C” Creativity by creativity researchers. Because creations that are “big C” Creative—novel to a knowledgeable social group—are by definition novel to each individual within that group, “little c” creativity is also satisfied. (Sawyer, 2012, p. 8)

Library creativity as a general rule is less concerned with “big C” Creativity than it is with “little c” creativity—the expression of a new “mental combination” in the world.

The Need for Creativity

In recent years, theorists in a number of fields have identified a number of skills, practices, and habits of mind as being particularly important and useful as we move more deeply into the 21st century. These observations are influential and have garnered attention among governmental and organizational policy-makers. The excerpts examined below focus specifically on those aspects that reinforce the need for creativity support within libraries and other institutions.

Twenty-first Century Skills

P21, a national nonprofit with membership drawn from educational organizations and businesses that advocates for “21st century readiness for every student,” has identified a set of student outcomes that they believe students need to master (P21, n.d.). Among the skills, knowledge, and expertise on which they focus are found:

- Learning and Innovation Skills, including creativity and innovation; critical thinking and problem solving; and communication and collaboration.
- Information, Media and Technology Skills, including media literacy, which entails both media analysis and media creation, and ICT (information and communications technology) literacy.
- Life and Career Skills, including flexibility and adaptability; initiative & self direction; and social & cross-cultural skills.

The American Association of School Librarian's *Standards for the 21st-Century Learner* (2007) notes the importance of reading and understanding text in all formats (e.g. print, picture, video) and of technology as a tool of learning. The ability to create new knowledge and the significance of multiple literacies—including digital, visual, textual, and technological—are stressed. Skills and dispositions identified in this document include:

- 2.1.1 Continue an inquiry based research process by applying critical thinking skills (analysis, synthesis, evaluation, organization) to information and knowledge in order to construct new understandings, draw conclusions, and create new knowledge.
- 2.1.6 Use the writing process, media and visual literacy, and technology skills to create products that express new understandings.
- 2.2.4 Demonstrate personal productivity by completing products to express learning.
- 3.1.4 Use technology and other information tools to organize and display knowledge and understanding in ways that others can view, use, and assess.
- 4.1.3 Respond to literature and creative expressions of ideas in various formats and genres.
- 4.1.8 Use creative and artistic formats to express personal learning.
- 4.3.3 Seek opportunities for pursuing personal and aesthetic growth.

The International Society for Technology in Education's "Standards for Students" (2007) start with "Creativity and Innovation" as the first standard, describing it as "Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology." This is done in several ways, including: "Apply existing knowledge to generate new ideas, products, or processes . . . Create original works as a means of personal or group expression. . . . Use models and simulations to explore complex systems and issues." Other critical standards include "Communicate information and ideas effectively to multiple audiences using a variety of media and formats" and "Transfer current knowledge to learning of new technologies."

The Association of College & Research Libraries' "Framework for Information Literacy for Higher Education" (2015b), filed recently by the ACRL board as one of several such documents around information literacy, include similar creativity-oriented standards for students in colleges and universities. In defining information creation as a process, the authors of the framework emphasize analytical media literacy when suggesting that the information creation process "could result in a range of information formats and modes of delivery" and that "[t]he dynamic nature of information creation and dissemination requires ongoing attention to understand evolving creation processes." They emphasize the need to understand media formats and their impact on the information being conveyed.

Libraries and educational institutions of all kinds are clearly placing emphasis on the support of creativity as core to their missions moving deeper into the current century.

Media literacy. One of the 21st-century skills mentioned above in favor of creative efforts in the realm of communicating ideas—and hence appropriate to libraries—is the idea of educating people in the area of media literacy in both its consumption and creative senses. The National Association of Media Literacy Education (n.d.) offers a useful definition for media literacy, which they see as “a basic life skill for the 21st century”:

Within North America, media literacy is seen to consist of a series of communication competencies, including the ability to ACCESS, ANALYZE, EVALUATE, and COMMUNICATE information in a variety of forms, including print and non-print messages.

Media literacy empowers people to be both critical thinkers and creative producers of an increasingly wide range of messages using image, language, and sound. It is the skillful application of literacy skills to media and technology messages. (n.d., paragraphs 1 and 2)

The idea of media literacy—particularly in the realm of creating media—is central to libraries, which have for years made media content available for patrons. As the tools become available (see below), media content consumers are increasingly content creators. Libraries are in a strong position to assist them through programs and tools.

The Importance of Informal Learning and Undirected Play

One of the opportunities a dedicated creative space in libraries gives to users is the chance not only to use tools in a directed fashion, but to explore technologies and creative processes on their own time and in their own way, creating an environment conducive to information and skill retention.

Definitions vary (Werquin, 2007), but informal learning might usefully be defined as “intentional or tacit learning in which we engage either individually or collectively without direct reliance on a teacher or an externally-organized curriculum” (Livingstone, 2001). This is contrasted with formal learning (schooling) and non-formal learning (structured learning in a non-classroom setting, e.g., tennis lessons) (Organisation for Economic Co-operation and Development, 2015).

Recent studies of informal learning describe a significant amount of childhood learning as occurring in informal settings (Bell, Lewenstein, Shouse, & Feder, 2009). Children learn at home, in community centers and clubs, at museums, and online. Such settings “are often highly social and offer a form of mentoring, apprenticeship, and participation that maximizes motivation and engages the learner’s sense of identity; learners come to think of themselves as good in technology or as budding scientists, and

such self-concepts influence children's interests, goals, and future choices" (Meltzoff, Kuhl, Movellan, & Sejnowski, 2009).

Informal learning is exercised by adult learners as well. Various studies indicate that anywhere from 70% to 90% of job knowledge is learned informally on the job rather than in formal training settings (Cross & Internet Time Group, n.d.). It benefits adults in a number of ways from the individual to the community: improvement to meta-cognition, self-confidence, and social skills; the formation of partnerships and collaborative efforts; community capacity-building through the acquisition of technical and other transferable skills; and even a wider societal benefit of commitment to citizenship, social identity, and information gathering (Cullen et al., 2000, p. 13).

Building on that in a way particularly meaningful to libraries, research has shown that informal learning is enhanced when it is done in certain places, as the particular materials and activities associated with those particular places influence learning processes and outcomes (Bell, Lewenstein, Shouse, & Feder, 2009).

The expert use of artifacts (e.g., an apparatus in a museum exhibit, a scientific representation of data) for responding to problems or accomplishing projects that people engage in can be viewed as a desired form of intelligent human performance in its own right" (p. 37).

Learning objects and their related activities often appear in some places more so than others, and that association makes those spaces unique. Media are likewise "a rich layer of learning artifacts" (p. 38), with the various forms providing infrastructure for learning. The development and sharing of media objects strengthens learning and social interaction.

Provided they permit non-curricular or undirected experimentation and exploration of their tools and technologies, creative spaces in libraries provide a place where both children and adults can reap the benefits of unstructured play. The American Academy of Pediatrics released a report (Ginsburg, the Committee on Communications, & the Committee on Psychosocial Aspects of Child and Family Health, 2007) detailing the benefits of play to children:

Play allows children to use their creativity while developing their imagination, dexterity, and physical, cognitive, and emotional strength. Play is important to healthy brain development. It is through play that children at a very early age engage and interact in the world around them. Play allows children to create and explore a world they can master, conquering their fears while practicing adult roles, sometimes in conjunction with other children or adult caregivers. As they master their world, play helps children develop new competencies that lead to enhanced confidence and the resiliency they will need to face future challenges. Undirected

play allows children to learn how to work in groups, to share, to negotiate, to resolve conflicts, and to learn self-advocacy skills (p. 183).

Experiential learning. Related to the ideas of 21st-century skills and of play is that of experiential learning. Wurdinger & Carlson (2010) describe experiential learning as a learning approach “where students are actively engaged in the learning process.” They suggest five teaching approaches that intentionally promote experiential learning: project based learning, problem based learning, service learning, place based education, and active learning. The goal is to turn students into “motivated self-directed learners” (p. 7). Dedicated library-based creative spaces have an opportunity to engage users in experiential learning of the highest order. Certainly all five teaching approaches can be undertaken in such spaces.

Why Should Libraries Pay Attention to Creativity at All?

In short, the answer to that question is because creativity and support of the exploration of new technology are already core values of libraries and are seen by the public as part of their mission.

Five years ago, OCLC reported that “The library brand is ‘books,’” at least according to 75% of the people surveyed for the report. This was up from their 2005 study which saw 69% of respondents say “books” were the first thing that came to mind when thinking about the library (De Rosa, Cantrell, Carlson, Gallagher, Hawk, & Sturtz, 2011). This news was not received positively by many within the profession who know it to be true that libraries’ missions take them far beyond books (Adams et al., 2014; birdie, 2013; Matthews, 2011).

A recent examination of public libraries by the Pew Research Center (Horrigan, 2015) shows the public holding a more nuanced view of the kinds of services they wish to see from their libraries. Among those findings are that Americans would like public libraries to:

- support local education;
- serve special constituents such as veterans, active-duty military personnel and immigrants;
- help local businesses, job seekers and those upgrading their work skills;
- embrace new technologies such as 3-D printers and provide services to help patrons learn about high-tech gadgetry (Horrigan, 2015, p. 2).

These last two points are especially relevant to libraries exploring or establishing creative spaces in the future, as is the statistic that shows that 80% of respondents believe libraries should definitely or should maybe “[b]uy 3-D printers and other digital tools to allow people to learn how to use them to make different kinds of objects” while 87% of

respondents believe they should definitely or should maybe “create services or programs for local businesses and entrepreneurs” (Horrigan, 2015, p. 22).

In another related finding, of the visitors to public libraries or users of their apps or websites over the previous twelve-month period:

- 8% turned to help available through the library to learn how to create digital audio or music.
- 6% undertook a similar strategy using library resources for learning how to create video.
- 6% turned to the library or its digital assets to learn how to create software or write computer code for websites, games or apps (Horrigan, 2015, pp. 18-19).

Of those who went to the library in person over the previous year, 9% went to use a 3-D printer or other advanced technology, “something related to creativity and self-expression as well as job skills” (Horrigan, 2015, p. 25).

So clearly and rightly, libraries—at least public libraries in this case—are being seen as places of creativity, where advanced technologies and assistance with those technologies can be found.

The Values, Philosophies, and Missions of Libraries

A number of values, philosophies, and missions of libraries as articulated within professional organizations point the way toward library support of creativity within their walls.

American Library Association. In its strategic plan, adopted in June 2015, the American Library Association articulates a number of related points (American Library Association, 2015). Among their Core Organizational Values is a commitment to excellence and innovation. In one “Key Action Area” on the equitable access to information and library services, the Association “recognizes the critical need for access to library and information resources, services, and technologies by all people,” especially those facing a number of challenging barriers (American Library Association, 2015, p. 2). The organization similarly recognizes the use of technology as a necessary literacy (p. 2) and further,

ALA provides leadership in the transformation of libraries and library services in a dynamic and increasingly global digital information environment. Every library is a hub of community engagement, innovation and continual learning (p. 3).

Among the goals of their advocacy initiative, the ALA declares that “[t]he library is a hub of community engagement and continual learning: a place to form the critical

thinking skills fundamental to learning in a technologically evolving world, to access information, and to create and share new knowledge” (p. 3).

A number of ALA divisions offer related statements focusing on their particular constituencies:

American Association of School Librarians. The AASL (American Association of School Librarians, 2013) lists as one of the formal goals of the organization that they will “prepare students for life-long learning, informed decision-making, a love of reading, and the use of information technologies.”

Association of College and Research Libraries. The ACRL (Association of College & Research Libraries, 2015a) holds as a core organizational value a commitment to “visionary leadership, transformation, new ideas, and global perspectives” and one of their five-year goals is “Librarians transform student learning, pedagogy, and instructional practices through creative and innovative collaborations.” Two relevant objectives help meet this goal: “Identify innovative practices in learning environments and instruction that enable academic librarians to transform learning” and “Increase understanding of new models of information fluency as pedagogy evolves” (Association of College & Research Libraries, 2015a).

Public Library Association. In its strategic plan (Public Library Association, 2014), the PLA reaffirms its commitment to the core value of “Excellence and Innovation” (p. 3). In the plan’s “Vivid Description of a Desired Future,” they write:

The library provides a pathway to a better future for all community members by serving as the principal destination for individual learning, enrichment, and economic opportunity. Community members are attracted by the library as a learning space where they will find expert assistance, relevant resources and tools for research, content sharing and creation, and opportunity for cultural enrichment. . . . Both the library’s virtual presence and physical space are important, and community members make ample use of the library’s cutting-edge technology and learning spaces to actively engage library resources from home and on-the-go (pp. 3-4).

Related to the focus of this chapter, as part of their stated goal of advancing the transformation of public libraries, they articulate an objective to “[h]elp define and support the transition of public libraries to learning spaces” (p. 5). Furthermore, they wish to “[c]ontinue to increase awareness of the many types of literacy necessary for success for 21st century skills development and success” (p. 6). Finally, the PLA lists a number of related assumptions on which their strategic plan rests. Among these are:

- The library as a place for content creation will continue to grow.
- More and more people will use the library's technology resources.
- Technology will allow libraries the opportunity to attract and serve new client groups.
- Technology will affect everything libraries do.
- Technology training will continue to be a challenge.
- Online social networking will continue to evolve.
- There will be a greater interest and demand for user-generated content (Public Library Association, 2014, pp. 8-9).

While these groups should not be seen as universally representative of library professionals' views, they do represent a large number of such professionals and their considered statements of values, missions, and other articulations of emphasis help to articulate the trends found in the field of librarianship.

The Purposes of Libraries as Seen by Users

It is appropriate, too, to look at the flip side of the equation—not how libraries see themselves fitting into society or the ways that they plan to address societal changes in the course of their next strategic plans, but the ways in which libraries are seen as useful to their users. We had one look at this question through the Pew (Horrigan, 2015) report mentioned above. Another recent study, Wayne Wiegand's *Part of Our Lives: A People's History of the American Public Library* (2015) examines not, as Wiegand's colleague Doug Zweig put it, "the user in the life of the library" but instead "the library in the life of the user" (p. 2). This Wiegand does through a comprehensive look at first-person stories from the years 1850 to 2010 about personal library experiences. He found that:

[h]istory shows that the reasons Americans have loved their public libraries fit into three broad categories: for the useful information they made accessible; for the public spaces they provided; and for the power of reading stories they circulated that helped users make sense of phenomena in the world around them (p. 3).

Much of the emphasis by the various library associations above is on the need for innovation, transformation, and exposure to technology. Very little of it is about the provision of spaces for library users. Yet Wiegand's research finds that the library as place looms large in the lives of its users. His stories range from that of a twelve-year-old boy (Jimmy Levine) who played the piano in the Cincinnati Public Library's piano room when it opened in 1955 only to grow to become the music director of New York's Metropolitan Opera years later, to that of the Virginia, MN, Public Library's 1917 installation of a kitchenette in the basement for demonstrating modern meal preparation to farm wives, to the massive Harry Potter release parties held in libraries across the country in the 2000s

(Wiegand, 2015). Clearly for these patrons and many others, library spaces themselves had great meaning (Council on Library and Information Resources, 2005). This will be discussed further below in the context of the library creative spaces.

The Influence of Participatory Culture

More thorough treatments of the notion of “participatory culture” can be found in a number of places (Delwiche & Henderson, 2013; Jenkins, 2006a; Jenkins, 2013), but a brief recap of the idea and its influence on technologies—especially creative and media technologies—will help situate creative spaces in libraries in a particular cultural context unique to the early twenty-first century.

In a MacArthur Foundation white paper (Jenkins, 2006a), a participatory culture is defined as

. . . a culture with relatively low barriers to artistic expression and civic engagement, strong support for creating and sharing one’s creations, and some type of informal mentorship whereby what is known by the most experienced is passed along to novices. A participatory culture is also one in which members believe their contributions matter, and feel some degree of social connection with one another (at the least they care what other people think about what they have created) (p. 3).

What makes for a participatory culture, or in what ways do we find ourselves in one today that’s different from even the late 20th century? The elements of Jenkins’ definition point the way: 1.) low barriers to expression and engagement, prompted by lowered costs of technology in both money and time, 2.) strong support for creating and sharing, especially seen in the social and technical infrastructure that is the Internet, and 3.) mentorships, most demonstrably through the presence of online and offline communities of practice.

“Web 2.0” is the term Darcy DiNucci (1999) coined and Tim O’Reilly (2005) popularized, used to describe a *mélange* of technologies and approaches to the web which were then emerging and whose influence is still going strong a decade later. No longer a static means of content produced largely by experts (or at least those familiar with HTML), the web had emerged as a platform for user-generated content. Blogs were the bell cows of Web 2.0—now anybody could post their thoughts online without knowing anything about markup languages or server management, and RSS feeds allowed their writing and other creative efforts to be shared instantly. Sites like Flickr and Yelp emerged that provided people places to post images and opinions and comment on them. Wikipedia tapped into “the wisdom of the crowds.” With YouTube, anybody could share videos of their own crafting (and their own cats).

The point is less to revisit the heady era of Everything 2.0 than it is to point out that by now, expectations and experiences have shifted so that participation and interactivity are largely the norm online and through our devices. Technical barriers to

participation have largely been removed and it takes no time to be able to contribute online.

At the same time, creative technologies that were once expensive and more or less only available to hobbyists and experts have now become inexpensive and ubiquitous. In the 1970s, if one wanted a video produced, one typically had to hire a professional who largely operated from a professional studio. Super 8 was a popular hobbyist film format often used for home movies but that required physical editing via cutting and splicing for anything more complicated. More significantly, there was no easy way to share the results of one's efforts to a wide audience.

Compare that to the wide range of digital video-recording options available to users today, from dedicated camcorders to smart phones to webcams to GoPros and more. Rather than clunky manual editing of film, nonlinear editing software is available for free downloading, comes packaged with a computer (e.g. iMovie), or can be bought at sophistications ranging from the most basic to professional-grade (e.g. Adobe Premiere). Assistance in using any of these is available at the click of mouse, whether it is in the form of online tutorials or through communities of users.

Digital advances have similarly revolutionized hardware and software availability (through lowering costs) and usability in still image, audio, graphics, and visualization production. No longer are the means of production limited to professionals and the odd hobbyist.

Even given those advances, there would be no participatory culture without the means of sharing created works, and that is where the Internet has made all the difference. As Jenkins (2006b) writes regarding amateur movies made by fans of film franchises:

Fans have always been early adapters of new media technologies; their fascination with fictional universes often inspires new forms of cultural production, ranging from costumes to fanzines and, now, digital cinema. Fans are the most active segment of the media audience, one that refuses to simply accept what they are given, but rather insists of the right to become full participants. None of this is new. What has shifted is the visibility of fan culture. The Web provides a powerful new distribution channel for amateur cultural production. Amateurs have been making home movies for decades; these movies are going public (pp. 131-132).

Not only are there widespread places where particular content can be shared and found and discussed, from YouTube and Vimeo for video to SoundCloud and Clyp for audio to Imgur and Pinterest for images and so on, but the culture of the participatory web has also given rise to new, sharing-oriented forms of intellectual property protection (and permission) such as Creative Commons licensing.

Just as importantly, these online evolutions have made it easier than ever for like-minded people to find one another on the web and build communities of interest and practice, sharing information about the things that they are passionate about and

collaborating on creative efforts. People who know more are able and welcome to help those who know less. As Hamilton and Schmidt (2015) put it about the maker movement, one particular corner of this creative participatory culture:

It is this networked context that allowed the Maker movement to develop and flourish. Not only did it make life easier for someone to get started with a new interest but it's also more *fun* to learn and share with others who share your enthusiasm. Learning to knit with a group of others to get you started off on the right foot, to show off your successes to, and to help you troubleshoot your mistakes is much more satisfying than hoping for the best to follow instructions out of a book.

So how to Makers today find each other? There are a myriad of options available. Sometimes they start out in the traditional way—being introduced to a new hobby by a friend. But there are also opportunities online such as Meetup.com, where searching locally will put one in touch with groups focusing on photography, knitting, scrapbooking, robotics, and more. Instructables.com offers groups for 3D design, knitting, jewelry making, and more—and its community forums cover an even wider range of topics. Those interested in electronics can find others on the SparkFun forums (<https://forum.sparkfun.com/>). And of course, *Make* magazine offers both a Google+ community and online forums to give Makers a chance to connect and learn with each other. Skillshare.com offers a unique opportunity to pair those interested with willing teachers for anything from web page design to making meatballs (pp. 15-16).

The upshot of all this is that adding lowered barriers to participation (through less-costly technology and easier-to-use systems) and a widely-accessible communications network (the Internet) to burgeoning communities of likeminded people has produced a new explosion of creative work in many corners of the globe.

It is crucially important, however, to note that it is not available to *every* corner yet. “Less-costly” does not always mean “inexpensive,” nor does “widely-accessible” mean “universally-accessible.” The question of the digital divide remains real even as it evolves from one focused almost exclusively on access to one of sociocultural and skill development (Jenkins, 2006a). The kinds of work touted by those who see a bright future in participatory culture including makerspaces is subject to a number of critiques. Zenfopro (2015) questions these claims based on a perceived mismatch between many librarians and the needs of the constituents they serve. In an empirical study, Hargittai and Walejko (2008) find that neither creation nor sharing is distributed randomly across a population of young adults but instead depend on factors such as socioeconomic status and gender. Schradie (2011) supports these findings in his own study, finding that a class-based digital production inequality exists because of expanded elite access to creative content applications.

Schradie (2011) concludes her paper by suggesting that the availability of tools of production cannot be limited only to institutions:

When people are able to access a computer at multiple places, or with multiple gadgets, frequently throughout the day, they have more control over the production process, and can produce more content. One implication for these results is that access at a location over which economically disadvantaged people have no control, such as a library or school, limits their likelihood of producing online content (p. 166).

It would be injudicious to conclude—nor, I think, is Schradie arguing—that therefore the best thing to do would be to *not* expose people to tools of creative production at schools and libraries. Instead, a both/and argument needs to be made. It is important to support the availability of these technologies in libraries of all kinds—especially public and school libraries, as indicated in the Pew report (Horrigan, 2015) discussed above—since doing so provides an opportunity for all users to experience the technology first-hand. At the same time, systems need to be developed and pushed by libraries and others to widen the availability of these technologies to all people.

One important approach libraries can take, and have taken through their history, is in focusing on the needs of their communities when determining the kinds of creative technologies they wish to make available and support (Zenfopro, 2015). This notion is addressed in more detail in the section below.

Libraries' Historical Role in Introducing Creative Technologies

Everett Rogers introduced a widely-used theory of the diffusion of innovation in 1962 (Rogers, 2003). In his theory he lists five characteristics of innovations that help explain their different rates of adoption:

1. *relative advantage*, the degree to which an innovation is perceived as better than the idea it supersedes,
2. *compatibility*, the degree to which an innovation is perceived as being consistent with the existing values, past experiences, and needs of potential adopters,
3. *complexity*, the degree to which an innovation is perceived as difficult to understand and use,
4. *trialability*, the degree to which an innovation may be experimented with on a limited basis, and
5. *observability*, the degree to which the results of an innovation are visible to others (pp. 15-16).

One of the chief reasons (Horrigan, 2015) for modern libraries introducing new technologies is #4, *trialability*. Rogers further explains the idea:

New ideas that can be tried on the installment plan will generally be adopted more quickly than innovations that are not divisible. Ryan and Gross (1943) found that every one of their Iowa farmer respondents adopted hybrid seed corn by first trying it on a partial basis. If the new seed could not have been sampled experimentally, its rate of adoption would have been much slower. Even then, many years of trial occurred before the typical Iowa farmer planted 100 percent of his corn acreage in hybrid seed. An innovation that is trialable represents less uncertainty to the individual who is considering it for adoption, as it is possible to learn by doing (Rogers, 2003, p. 16).

So in what ways have libraries introduced new creative technologies that by dint of expense or degree of innovation have not yet become fully familiar to the mainstream? Historically, due to limited resources and a wide-ranging constituency, libraries have not been able to invest in the bleeding edge of expensive new creative technology. But they typically have monitored the development of and invested in such tech as a shared resource at some point after it was made commercially available but prior to it become fully ubiquitous. It is a pattern repeated throughout modern library history.

A brief history of user-driven creative technologies in libraries

The enormous amount of literature (Loucks-DiMatteo, 1985; Widzinski, 2010) related to the history of the use and management of media *content* collections—maps, images, audio and video recordings, laser discs, CDs, DVDs, etc.—lies outside the scope of this chapter. But an overview may prove helpful as a contextual orientation.

In a list of firsts it is perhaps an oversimplification to skip past millennia of advances in communications media from cave paintings to pictograms to alphabets to printing, but modern libraries in the United States didn't start providing organized access to nontextual material until the first map collection was donated to Harvard in 1818 (Cobb, 1977); slide libraries were established in university libraries in the 1880s; a circulating picture collection at the Denver Public Library in 1891; a motion picture deposit at the Library of Congress in 1894; a phonorecord collection at the Library of Congress in 1903; circulating print and framed paintings at the Newark (NJ) Public Library in 1904 (all previous, Loucks-DiMatteo, 1985).

Firsts are one thing, but it's helpful, too, to understand when various technologies became more commonplace in libraries:

By 1924, audiovisual material in libraries had become common enough that audiovisual librarianship was introduced into the American Library Association that year. In the 1930s, public libraries began developing extensive film services. By 1940 hundreds

of universities and school systems had established audiovisual libraries. In the 1950s, major film collections were established at academic libraries, as was the 35mm slide. In the late 1960s, libraries and audiovisual departments were merged in schools; before the mid-1960s, they had largely been managed separately (all previous, Loucks-DiMatteo, 1985). In the 1970s, audiocassettes supplanted reel-to-reel tapes as the medium of choice; in the 1970s (U-matic) and 1980s (Beta and VHS), videocassettes did the same for film; in the 1990s, it was CDs replacing cassettes and LPs (Hage, 1999; Widzinski, 2010).

All those milestones are related to media created elsewhere and *consumed* at the library, not that media *created* in the library. Library-provided technologies for the creation of non-textual media has its own, albeit less comprehensively examined, timeline of milestones:

Hands-on crafts. Public libraries have offered children's craft activities for decades, a fact that is perhaps not lost on such library staffers when they hear about the "new" idea of makerspaces. As far back as World War II (Remington & Metcalfe, 1945), observers of Australian libraries remarked that "[t]he separate children's library so-called is often as much an arts and crafts centre for children." In 1970 in the United States, craft activities were the lead items in a collection of material supporting "Creative Programming for Children" (Hektoen, 1970).

Audio recording. Lawson (1945) reported activities that "were extracurricular in nature" related to the recording attachment on the radio-phonographs that had been purchased for a space called the Fine Arts Study at the Drew University library:

Recordings have been made of various extra-classroom activities. Last year the college band made one before its members were caught in the draft. The Seminary Players recorded their Easter play. Selected recordings were made of the Brothers College weekly broadcasts from Newburgh, N.Y.

From time to time individual recordings are made. Some students like to make them of speeches or songs, to send home to their parents. This sort of thing has been very popular since the declaration of war (pp. 124-125).

In 1946, in a then-unusual step, the University of Oregon founded an audiovisual service as part of the university library, and that service included the provision of wire and magnetic tape recorders (Swank, 1948).

Still cameras. The earliest mention I could find of still cameras for patron use (as opposed to that for use by library staff in microfilming or otherwise capturing work-related images) was a story in *Library Journal* ("Polaroid offers 20,000 cameras," 1983) that mentioned that in 1979, the Robbins Library in Arlington, MA, had a camera loan program for patrons. Perhaps more significantly, the article reported that Polaroid Corporation was

going to donate 20,000 Sun cameras to public libraries throughout the U.S. to establish camera loan programs as part of the “Check This Out” program. The article notes that Polaroid will be fielding questions about the cameras via their toll-free customer service line (“Polaroid offers 20,000 cameras,” 1983).

Video cameras. In 1973, the Hennepin County (MN) Library System opened a media lab in a new library building. “Open to everyone, this lab is equipped for the processing of films, videotapes and slides and has become a neighborhood workshop for the community, used by both children and adults in almost equal numbers” (“Hennepin County,” 1974). In April 1981, the Brooklyn Public Library opened a media center for use by the general public. The center offered patrons “the opportunity to edit their own Super 8 film and ½- and ¾-inch video and audio tape. For the less ambitious shutterbug or mediaphile, the library provides access to equipment for viewing slides and filmstrips.” In 1977, the library had already been offering a video skills workshop to the public. Much of the funding for the equipment came from the federal Library Services and Construction Act (LSCA), the precursor to today’s Institute of Museum and Library Services (Ebarb, 1981).

Microcomputers. It was not until 1977 that the first commercially produced microcomputers came onto the market. In the early 1980s, libraries—mostly public and school libraries—began making microcomputer hardware and software available to patrons in “computer resource centers” (Costa & Costa 1986, Wallace & Giglierano, 1989). In 1983, the Galveston Daily News reported that Eric de las Alas, a senior computer science major at the University of Houston would be offering a five-week BASIC programming class on the Rosenberg Library’s two new Apple II plus computers. Patrons wishing to take the course need to already have “a computer-approved library card, issued to those who demonstrate satisfactory computer-handling ability” after receiving an orientation to the machines. (“Island library,” 1983).

Modern library creative spaces

Media centers. Though as we have seen, they trace their roots to media labs created in the 1970s and 1980s, recent years have seen an explosion of media production centers—or at least widespread availability of media-production tools—in libraries of all kinds. This can be traced to the relatively low cost in recent years of digital media production equipment, as discussed above. In 1994, the University of Oregon Science Library had an Information Technology Center offering “X-terminals and Macs along with scanners, digital cameras, and sophisticated multimedia and Web publishing software” including Photoshop, GraphicConvertor, and PaintShopPro (Holman, 1999). The author does offer a few salient observations:

The price of digital cameras has been high enough to prevent many individuals from purchasing them; what a fabulous service for our patrons to be able to use something they cannot afford to buy themselves! . . . It seems that the sciences are often the first to adopt new technologies. Being so involved with grants, scientists often have the money to buy new technologies (Holman, 1999).

In the early 2000s, “when the cost of purchasing still and video digital cameras was prohibitive for academic departments” (Wood, Melita, & Wildman, 2004, p. 410), SUNY Cortland bought a digital camera and placed in the library for student use. Four years later, with the price of cameras having come down and expectations for their use by students (and support by the library) having gone up, the library decided to develop what they called “an activity-centered library.”

We have installed a Multimedia Studio, have begun circulating the existing collection of VHS recording equipment, acquired a Mobile Classroom with wireless laptops, added word processing, spreadsheets, and presentation software to the reference area computers, and acquired cameras to circulate in support of numerous requests from faculty and students. (Wood, Melita, & Wildman, 2004, p. 410)

As prices continue to drop, the development of these spaces has picked up in pace and complexity. In 2015, *American Libraries* reported (Gargano, 2015) the development of a number of state-of-the-art recording studios in many public libraries due to the rise of “relatively inexpensive digital audio and video recording software” such as GarageBand and Premiere Pro.

“Our branches are centers of community-based learning where individuals from all walks of life can access technology, acquire new skills, and explore their creativity,” Lane Edwards, manager of the Garfield Heights branch of the Cuyahoga County (Ohio) Public Library, tells *American Libraries*. “Audio and video recording studios enhance those traditional services and support our mission. They are high-tech learning environments where our customers are afforded endless opportunities for creative expression and personal growth.” (Gargano, 2015, p. 20).

One public library profiled offers musical instruments in the audio studio and a green screen and lighting. Users range from teens to local businesses. Another offers live video production software and a newsroom set. “The technical capabilities vary at each location,” writes Gargano, “but the mission is consistent: to offer a place where patrons of every age and skill set can learn new skills or hone existing ones” (Gargano, 2015, p. 20).

Media production centers like these and many others have started to connect through communities like the Multimedia Production Discussion Group (MULTIMEDIA-L) loosely affiliated with the Video Round Table of the American Libraries Association.

Makerspaces. Makerspaces are probably the first thing that pops into current readers' minds when thinking about new ideas of creativity in libraries. As library makerspaces have become popular in the last three or four years, the literature addressing these programs has increased, primarily in the form of popular writing and in books rather than in peer-reviewed publications (Moorefield-Lang, 2015, p. 108), which echoes a pattern that was remarked upon by Wallace and Giglierano (1989) when microcomputers were just beginning to bloom into libraries. It is worth quoting here—substitute the term “makerspace” for “microcomputer” and the quote will ring just as true today:

Pratt (1984) has described the literature on microcomputer use in libraries as being “a mile wide and an inch deep” (p. 248). Despite four years of developing use and a rapidly growing literature since the publication of that statement, it is for the most part still accurate. The literature to date is mostly descriptive rather than analytical, mostly pragmatic rather than theoretical. It is clear that the microcomputer has very quickly become a standard and nearly ubiquitous part of the repertoire of tools for use in libraries. It is equally apparent that librarians are still in an era of discovery with regard to microcomputers, exploring their uses and limitations, and accepting them into libraries with a mixture of enthusiasm and caution (Wallace & Giglierano 1989, pp. 284-285).

This insight is not to denigrate makerspaces in any way, but just to observe the challenge confronted by the library makerspace researcher. Indeed, notably thoughtful work on their place in libraries is very much being done in book, article, blog, and presentation form, with more coming out almost daily.¹ One brief excellent treatment of the makerspace's place in libraries is Hamilton and Schmidt's *Make It Here: Inciting Creativity and Innovation in Your Library* (2015). Unlike most of the book-length resources about makerspaces in libraries (Altman, Berhardt, Horowitz, Lu, & Shapiro, 2015; Bagley, 2014; Burke, 2014), which tend to touch lightly on the question of why makerspaces in libraries before delving into the practicalities, Hamilton and Schmidt spend a little more time reflecting not only on why makerspaces, but why creativity in the library at all. In answering that question, they make the point that

¹ See, for example, online resources available from Burke at <http://www.users.miamioh.edu/burkejj/makerspaces.html>; Ginsberg at <http://library-maker-culture.weebly.com/>; and Hamilton and <https://delicious.com/theunquietlibrary/makerspace>.

[t]he purpose of a library was *never to provide access to information*. To borrow a concept from thinker an author Simon Sinek—this is the *what* we’ve done, but we need to truly consider the *why*. Why was it ever important to provide access to information? I think the words of John Cotton Dana provide an excellent answer in his definition (which refers to public libraries but I think applies to all types), a “library is the center of public happiness first, of public education next” (Hamilton & Schmidt, 2015, p. 2).

The authors then draw a connecting line from “happiness usually involves following through on one’s interest” to “not only being able to follow up with my interest but also *doing* something about it” to the notion that libraries’ “intentions always have been to support people’s *learning*. And some of that learning is much more effective when combined with *doing*” (p. 2).

This is a pretty excellent summary of not only why makerspaces, but why creativity at all in the library: passion plus self-education plus experiential learning.

The Future of Library Creative Spaces

At the outset of this chapter, I described its purpose as being one of drawing together four principle threads: a recognition at a societal level of the value and necessity of creativity and related skills and attributes; the philosophies, values, and missions of libraries; the rise of participatory culture benefiting from inexpensive technologies and improved communications; and library experience and historical practice in matters related to creativity. These are influences that have, through a kind of accident of history, come together in the early twenty-first century and seem likely to influence one another in the library sphere for some time to come.

They also provide some related food for thought as libraries and their staffs and communities examine what creativity might look like for them moving forward. In developing our new creative space (at present referred to as the Innovative Media Studio but soon to be renamed before formal launch in January 2016) at the Virginia Commonwealth University (VCU) Libraries in Richmond, VA, we have had occasion to address not only the practical matters of establishing a new multimedia and makerspace department within a purpose-built area of a new library building, but also some of the important philosophical and service questions to which such an effort give rise.

The points below are my closing thoughts in the form of advice to those who are contemplating the establishment of—or the very place of—some sort of creative space in their library in the coming years. Each point will be followed by a reflection on how these matters were addressed here in VCU Libraries, which might help ground them in a particular illustrative use case.

Know your users. Never in this chapter did I intentionally describe the ideal creative space for any given library, let alone one that would ever be crafted for all libraries, and the reason for that is simple. *Any newly-created creative space and the services and offerings associated with it must come from a thorough understanding of each library's particular constituency.* One of the challenges in developing a makerspace, to use one example, is the very fact that the newest technologies—3D printers, MakeyMakeys, laser cutters—seem to take up a lot of the public discussion and a certain amount of “well, they have it, we better get it” starts setting in as people start to create their spaces.

There is certainly nothing wrong with looking to other spaces for ideas, since it's hard to picture what might be right for your constituents without knowing what's out there (and how much it costs and how hard it is to do). Furthermore, people also benefit from being exposed to new things that they had never before imagined, since that kind of exposure can stretch them. But the best way to get the right mix between *needed* technologies and practices, *desired* technologies and practices, and technologies and practices that will *stretch* your constituents enough but not leave them behind is to delve back into an old library practice: work to thoroughly understand your user community. One county library might have the fanciest video studio that money can buy; the next one over might have an even happier group of creative people working strictly with pencils, wood, paper, and clay.

At VCU: Conversations started early in the process by talking with those who had originally pitched the idea of a more robust creative space at VCU Libraries. With planning well in train for a new library building, the time was right to create a purpose-built space with expanded opportunities. Conversations over the course of many months with various constituents—primarily faculty, staff, and students—assured us that we were on the right track in building a video studio, an audio studio, a makerspace, a video gaming/group viewing room, and enriching our circulating media equipment collection and enhancing the editing hardware and software on offer. Technologies in the makerspace will run the whole making gamut from handicrafts to Lego robotics to 3D printing and scanning and laser cutters. VCU is home to the number one-ranked public school of the arts, and even those students who are not part of that school have wide-ranging interests in all forms of creativity, so we took as broad an approach as we could (afford to) take. We are lucky to have the opportunity to test some areas for interest (for instance, will more people want traditional crafts or the “cutting-edge” tools?) and hope to commit additional resources in the areas that prove most popular.

Tie in with your mission. Another way to help determine exactly what kind of creative space is appropriate for your organization is to look closely at the mission of your library. Don't undertake a new space—whether it's a makerspace, a media center, a digital scholarship center, a hybrid, or another kind altogether—if doing so doesn't further the mission of the library or the organization of which it is a part. Look to the mission, too,

for guidance on the kinds of resources and services and goals for the center that are likely to help support the community. If there is a strategic plan in play for the wider organization (if, say, you're in a school or academic library), look to that for guidance as well.

At VCU: Virginia Commonwealth University is operating under a strategic plan, called the Quest for Distinction (Virginia Commonwealth University, n.d), that more than almost any I have personally been a part of thoroughly and truly guides directions on campus. Some of the goals set forth in that document particularly resonate with our department:

- Engage students, the alumni of tomorrow, in high-impact academic and extracurricular experiences that expand learning, promote civil discourse and engage students in self-reflection and creative expression.
- Increase universitywide productivity in high-impact research, scholarship and creative expression.
- Increase the commercialization of intellectual property and university-based technologies to advance innovation and economic development.

VCU Libraries, too, has a values statement (VCU Libraries, n.d.) that supports the wider mission of the university. Among the values we adhere to, and that particularly impact our department, are our library-wide commitments to:

- engage our communities and evolve to meet their needs
- promote, inspire, and support intellectual curiosity and lifelong discovery
- seek new technologies and methods for our communities to convey their discoveries to the world
- protect unrestricted access to scholarly research, creative expression, and ideas representing all points of view
- embrace creativity, agility, and energy in all our work (VCU Libraries, n.d.)

Finally, linked from there is the Libraries' "Strategic Framework," which is guiding our own strategic efforts in the next few years. Among the foci of that document that most directly affect our department are "Advance collaborative learning and teaching environments through innovative technologies" and "Collaborate with VCU faculty in research." It is extremely helpful from philosophical and from administrative perspective for us to be able to position our services in these various official frameworks.

Saying no. Knowing the user community and having a thorough understanding of the mission and strategic direction of the library and/or the organization of which it is a part is extremely helpful in another way: saying a firm "no" to some new ideas. There are more opportunities and ideas for creative spaces than there will ever be time or money or

personnel to implement. It is crucial to be able to draw lines around the services and technologies on offer and say “We do this, yes, but we don’t do that.” Someone will come along and ask why your library can’t do this new thing, and you have to be able to say with real understanding why that new idea doesn’t fit—whether that’s just for right now or forever. Or if casting it in a positive light is preferable, think of a kind of mission statement for your new space and use it to guide decisions.

At VCU: I have developed a couple of phrases that help me to consider whether or not to add particular new technologies to the department. One is “we help people communicate their ideas in ways other than text.” That puts a slight emphasis for us on technologies that let average people learn about visual communication. It is why we’re adding GIS/data visualization workstations to our offerings and why we have invested in 3D printing (with the idea that such prints are, at their heart, three-dimensional ways of communicating). It is also why, for now, we probably won’t delve into computer programming and related scholarly support—those are more removed from our core missions of helping people communicate and helping them explore related emerging technologies. That is not to say that we won’t go into those areas in the future, but for now, that is the line we have chosen to draw.

Make room for the extracurricular. There is a temptation—again because of budgetary and time constraints—to try to draw limits on the purposes to which library creative spaces can be put. Resist that temptation. In a school or academic library, it is easy to say, “only class-related projects can be worked on using these resources,” but that would largely defeat the purpose of providing creative options at all. People learn best when they are doing projects that they are passionate about, and while some may certainly be passionate about getting good grades, for many others it’s the chance to work on some private or group project that excites them even if it has nothing to do with school. They’ll still be learning, and the learning will probably have deeper personal meaning.

At VCU: This one was easy for us, as it is one of the guiding principles of the department. We want it to be a place of playful exploration as well as focused productivity. This is more a mindset than anything else. But it pays off in spades when students realize that they can come in to use our equipment for projects that have nothing to do with school. Their glee—and sometimes amazement—goes through the roof. So much of what they do is prescribed, it’s like they feel like they’re getting away with something.

Creativity is more than STEM. Astute readers will also notice that nowhere in the text up to this point did I trot out the idea that creative spaces are important because of the way that these spaces strengthen STEM (Science, Technology, Engineering, and Math) education and training. That is a very common justification for the creation of creative spaces—especially makerspaces—and it makes sense, as various levels of government have

made a lot of money available in recent years to further the cause of STEM education. It is understandable why these spaces would therefore cast themselves as STEM-rich environments—there may be no other way to get funding.

But aside from mounting evidence that the United States is in fact not in a STEM-related professional crisis as has recently been thought (Charette, 2013; Teitelbaum, 2014), focusing solely on STEM is a disservice to the wider human need for creativity. That renders these spaces as narrowly goal-oriented, which in turn destroys opportunities for creative expression and learning in a whole host of ways. Already art and design have inserted themselves into STEM to create STEAM, as in the STEM to STEAM project (<http://stemtosteam.org/>). Still others (Root-Bernstein & Root-Bernstein, 2011) have argued in favor of STREAM (adding reading and wRiting as essential components as well). Still others (Zakaria, 2015) want to make sure the humanities aren't neglected, too—SHTREAM? At this point, we have just gone full circle and are back at what might more simply be called “liberal arts education.” And all areas of education benefit from an intentional investment in creativity and creative thinking.

At VCU: As mentioned, VCU is an arts-heavy campus. But alongside the School of the Arts is a nationally-ranked School of Medicine, plus the entire range of humanities, social sciences, and science offerings expected from a modern urban research university. Being a department of the library means that we benefit from the library's “brand” as an multidisciplinary intellectual crossroads. Limiting our creative activities only to “STEM only” would mean that we—and everybody that comes through our doors—would lose out on the experiences and passions of all those who don't think of themselves as part of the STEM crowd. One of the things that draws our users to us is that we are open for everybody, and everybody is welcome. That is often not the case on campus, when specialized creative labs and fabrication workshops are only available to members of certain schools or programs. It makes for a fertile sharing environment.

Look ahead at what is coming. Try not to create a space for only the current needs. Look to forecasts about technologies currently in development (the MIT Media Lab is always a good first place to turn). Try to understand where scholarship and education are headed. What if the predictions for highly-individualized online tutorial plans come true—what would that mean for the way students learn? How will they interact with each other and with technology? What would it mean for training within your space, or for the mission of your space—does that make the in-person community even more important? What if the augmented reality and virtual reality technologies now being developed do break through as promised and the prices start dropping? What if you could create visualizations of massive data sets as easily as adding text to a photo is now?

At VCU: We're watching developments in all these areas carefully, but especially in the realm of virtual and augmented reality. That aspect goes back to the “know your

community” conversation. At VCU we have a number of faculty (and hence students) that are interested in video gaming and virtual world-building, so we know that these will be technologies they are interested in. Likewise, we know that drones are another area where there is a lot of rapid technical development—and insufficiently rapid policy development—so we are monitoring those developments closely. Already the journalism department has an interest in this technology, as does engineering, as do many students who either just want to test the tech or use it for research or filmmaking. One of the pleasures of working in this world of creativity in libraries on a college campus is sharing the excitement with others (and learning from them) about emerging technologies.

Consider your space. Rarely will any of us have the opportunity to build an entirely new space, one that is one hundred percent purpose built to our every whim with absolutely no restrictions of cost or dimensions. The exciting thing is, rarely is that actually necessary. Much of the digital technology that has been discussed here does not require a large footprint (aside from the audio and video studios). Much can be created with “analog” technologies (saws, sewing machines, and swizzle sticks) that don’t require much space either. Be flexible in your approach—perhaps a “pop-up” space is a possibility for you, using the lobby or a tent outside or even a conference room when it isn’t otherwise occupied. Don’t let the physical dimensions prevent you from offering a wide-ranging set of creative tools. Forbes and Fast Company (Baer, 2014; Porter, 2014; Sturt, 2013) agree: creativity needs boundaries. Let your exploration of your space’s boundaries be your first act of creativity.

At VCU: Though we have, as noted, the very good fortune to be going into a space that was built for us in the new library building, already I know that there are additions or changes that we would have liked. The new Innovative Media Studio doesn’t have a dedicated room for instruction, for instance, and already we’ve fielded requests for that service. So we’ll have to work with other library departments to share other library class space, and figure out ways to teach small groups in the rooms we do have. I might have configured things a little differently, too, had I realized at the outset of this project in summer 2014 how popular an idea the makerspace portion of our area was going to be. But again, we recognize how incredibly fortunate we are. We did try to build in as much flexibility as we can in terms of power, mobile furniture, and service approach so that we can meet new opportunities and better ideas when they arise.

Conclusion

Creativity has been valued throughout human history, but it is garnering attention at social and policy levels in a way and in a communication environment that the world has not seen—not, certainly, a claim unique to our time since that can be said of virtually every era. Social and technological forces at play vary from one time period to the next. But we are

in the here and now, and right now there are exciting opportunities afoot for next-generation libraries to consider how they might support a renewed interest in hands-on creativity and creative thinking.

The next decade and more will see amazing opportunities in these areas. Robust technologies are available for relatively minimal costs. Libraries who have longstanding commitments to their communities and missions to serve information gathering and knowledge creation have new tools available to them. Communities of support are easily found, benefiting both the library staff and their patrons. Libraries can turn to their own histories and one another's experiences to draw on successful practices and find inspiration.

Libraries have long gotten public recognition and support for their role in information access and preservation. But they have also always had a role in knowledge creation. We're in a time now in which new tools permit new ways of creating and expressing knowledge, and dedicating spaces to supporting that creativity is a natural next step for libraries of all kinds.

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