RESEARCH BRIEF 8

Open Portfolio Project

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Open Portfolio Project: Research Brief 8

SURVEY OF MAKERSPACES, PART III

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Makerspaces and Existing Portfolio Practices

In "Survey of Makerspaces, Part II," we introduced a broad group of makerspaces that responded to our 2014 Maker Site Survey. Makerspaces call themselves by a variety of names and have a range of educational objectives, which are explored in further depth in the prior briefs summarizing the survey results. They also serve very diverse audiences across the United States and share commonalities among the skills, focus, and practices cultivated at each site. This brief summarizes the responses to a few additional sections of our survey (see Appendix B for a full copy of the survey) and explores the existing documentation and portfolio practices across the sites, important to the goals and objectives of the Maker Ed Open Portfolio Project. Through the survey, makerspaces revealed the extent to which they value and are adopting portfolio practices in their space. Additionally, the surveys provided critical qualitative information about practices at makerspaces. This brief is the third part of a three-part series summarizing the survey results.

The Importance of Documentation and Portfolio Practices

All sites were in agreement that documentation and portfolio practices were important to their organizations, with most indicating that they were very important (45%) and the remainder indicating that these practices were moderately important (28%) to important (27%) **(Figure 1)**. As such, makerspaces often have several spaces for documenting youth activities and support youth in creating their own, often personal, portfolio spaces. Many makerspaces aimed towards publishing documentation of as many events happening at the space as possible, in order to better advertise and recruit new members.
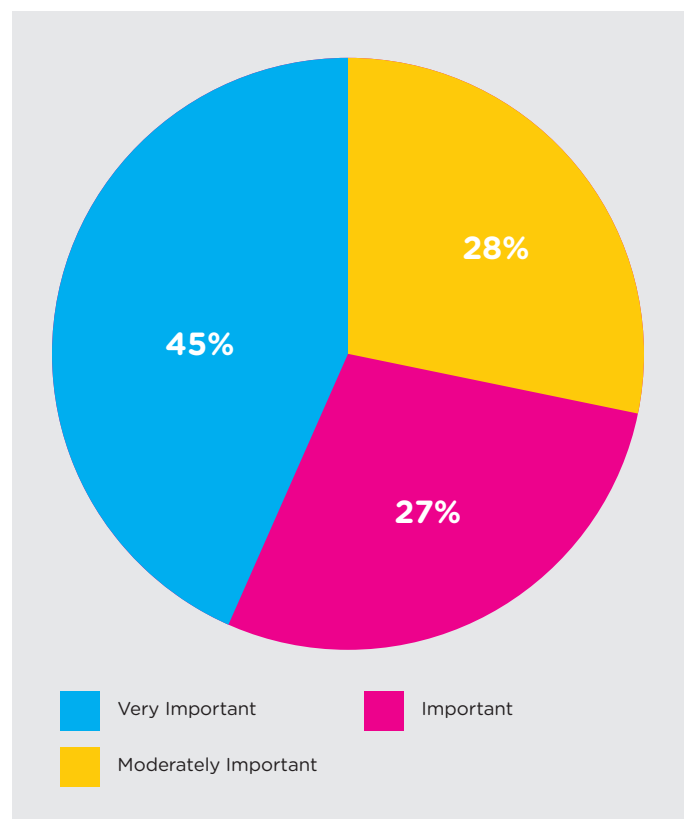
FIGURE 1: The percentage of sites indicating the varying degrees of importance of documentation and portfolios practices.

Describing Documentation and Portfolio Practices in Makerspaces

When asked whether the various makerspaces documented maker activities and projects, 86% of sites reported that they currently had a system in place. The systems involved using one particular tool or platform, a particular practice (e.g., printing and storing work in a folder), or a combination of practices. These practices

also ranged from simple forms of documentation (e.g., taking and posting a picture or screenshot of work for a flier or website) to more complex forms of documentation (e.g., posting a how-to on Instructables). Makerspaces also reported storing and exhibiting the physical artifacts in temporary and/or permanent installations, allowing documentation and sharing in local/physical spaces as well as in digital spaces.

Over half of the makerspaces (51%) reported that youth and educators (along with an occasional parent or professional photographer) frequently photograph finished works and works in progress, using digital cameras or smartphones, to share as part of portfolio practices. The colorful photographs are typically used to promote the activities of a space and to communicate ongoing work to new youth makers, maker educators and mentors, and people outside the space (e.g., non-members, funders).

Twenty-four percent (24%) of the sites also reported using video to document activities. For example, one site reported a particularly unique documentation practice of capturing and archiving stories of youth: the creation of 15-second videos to concisely summarize work. The videos were then uploaded and archived on Instagram, using hashtags for easy sorting. A noted downside to this practice was the loss of hashtags and metadata when videos were downloaded from Instagram back to the hard drive. Other sites frequently reported creating longer videos (ranging from one to 10 minutes)—edited from a larger pool of photographs, videos, and project files—that shared snapshots from specific workshops and events.

Sixteen percent (16%) of the sites also asked youth to write short, reflective paragraphs about their plans, current work in progress, and completed projects. These writings included musings about material choices, tools used, successes, failures, and general project overviews. These writings were frequently augmented by photographs as well as copies and scans of project sketches at the planning stage to better illustrate making activities, efforts, attempts, and learning.

Fifty-three percent (53%) of the participating sites reported sharing their documentation publicly, and 39% reported sharing their documentation privately. Of these, 29% of the sites reported sharing documentation both publicly and privately. To publish documentation, the sites used a wide range of blogging tools, including Blogger (2%), Tumblr (6%), WordPress (8%), and Squarespace (2%). Ten percent (10%) of sites mentioned the official makerspace website and 6% reported youth's personal websites as a place for dissemination.

A number of sites mentioned sharing blog posts on social media sites, including Twitter (6%), Instagram (4%), Facebook (4%), and particular Google+ groups that are affiliated with the Maker Education Initiative. Tools used to circulate documentation internally (e.g.,

among makerspace members and staff) were Evernote (6%) and Google Sites and Drive (12%), sometimes for assessment and accreditation purposes within the institution (4%).

Many sites developed internal and private spaces for documentation and sharing. The archived activities and guides were used in different ways: by multiple members of an organization to better link program efforts, for educators to build upon past work, and for youth to reference during activities. An outstanding example of internal sharing and portfolio assessment was offered by Envision Schools:

> To graduate, students deliver their College Success Portfolio Defense, during which they publicly present their artifacts to teachers and peers. These portfolios contain evidence of three things for each student: her knowledge of academic content; her leadership skills; and her identity as a learner. Preparing for the defense is rigorous and challenging, and standing up in front of the defense panel is an important moment in the lives of Envision students: it is the culminating event of their high school years. The defense panel determines, again using a rubric, if the presentation "passes" or if the student needs to revise, resubmit, and defend again. With infinite opportunities to revise and improve, every student will eventually pass, when every student reaches or exceed the rubric's rigorous standards for proficiency.

Other sites focus on the creation of instructional material by adults and youth, through the documentation of step-by-step manuals of unique projects. These materials include laminated how-to instructions for projects (e.g., animation, editing a green screen film, etc.), tutorial and how-to videos, lesson plans, and workshop formats.

Approximately one-third of the sites reported documentation practices that adopt a mix of sharing both externally and internally. For example, one site asked youth to write and privately store periodic updates over a long time period, eventually publishing a polished summary via a blog post. Other notable examples asked both adults and youth to participate in the documentation process; for example, adult educators augmented youth journal entries and posted Maker Faire projects with additional and more elaborate project descriptions. The journals and write-ups by adults and youths were shared with other makerspaces as well.

More data-driven and adult-centered approaches to documentation included conducting short surveys of youth makers at the beginning and at the end of an activity or program to evaluate change over time (6% of sites). Traditional documentation practices included creating detailed engineering and science project papers, storing sheets in binders, and developing digital presentations.

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Makerspaces also documented activities informally in online and offline newsletters and zines, as well as posting photographs and videos to personal media accounts, including YouTube (6%) and Flickr (6%), to back up data and project work. Six percent (6%) of the sites also reported storing student work as physical copies, including hardcopy portfolios like sketchbooks, in the space.

One of the sites reported the development of a unique digital application for capturing project information, including the tagging of tools, materials, and processes used, as well as the age of the maker. Another site reported interest in implementing a badging system in connection with portfolio creation, while a different site mentioned that specific workshop times with specific slots for documentation "helps students create and update their DIY.org portfolios" at a regular and designated time. Yet another site reported a requirement for youth members to participate and contribute to Google+ community pages.

One striking observation across the work is that individual makers are frequently documented alongside their work, especially with finished works, demonstrating both a sense of pride and identity tied to the work produced. This stands in contrast to the fine arts tradition in which the work, the maker, and the process are documented separately. Maker documentation tends to have a different aesthetic and introduces issues of privacy and online safety, particularly for minors, as we consider the implications for open portfolios and current national policies for documenting and sharing work.

While blogs or collections of URLs to youth work are frequently used as central locations for documentation, PowerPoint presentations and video reels of student work are also created. These presentation formats can be shared on social media tools for purposes of marketing and can be shown to and viewed by visitors or others for a quick overview of the site's makerspace activities.

When asked, roughly half of the sites reported having a way of collecting documentation in a central location. Makerspaces (49%) reported using an array of cloud-based services for storing and archiving photographs, screenshots, digital work, software code, and videos. These services included Dropbox and Google Drive, as well as a diverse range of private and public social media tools, including GitHub, YouTube, Flickr, Instructables, Google+, DIY.org, and Thingiverse.

Makerspaces that use documentation of youth work explicitly for assessment tended to store work in central spaces. Sites reported asking youth to submit their work to Evernote accounts and online classroom management tools. Students were asked to submit work to particular groups and to credit all participants.

Deepening Learning Through Feedback and Reflection with Portfolios

Portfolios are useful tools for deepening learning outcomes over time by supporting makers to visualize their projects and progress over time using openly networked tools (see "A Networked Vision for Sharing and Documenting"). As such, it is not surprising that nearly all sites reported providing feedback on youth projects through group or one-on-one discussion (98%). Sites also reported that youth utilized this feedback in their work (94%).

The most frequent practice related to reflection and feedback was peer review (13.7%) and included voluntary, compulsory, regular, and occasional peer review processes. Many noted that this type of "critique" of portfolios occurred before publication and was meant to help youth speak productively about another's works. Sites also mentioned mentor-to-peer review (1.9%) with a unique practice of facilitating "rough-cut screenings," a term from the film industry, in which professionals and staff members provided youth with suggestions for further development of video works in progress. One site noted that some youth considered feedback to be critical though difficult to provide.

As frequently as peer reviews, sites also mentioned using group feedback practices such as regular, periodic, or ad-hoc group sharing events; small group discussions at the start and end of a program; and in-person presentations. These group reflection and feedback events were reported to provide opportunities to discuss (a) what they were working on, (b) challenges they encountered, and (c) what they were planning on doing next.

Reported Barriers to Documentation and Portfolio Practices

In general, the majority of sites felt they had sufficient to excellent internet access, external storage space, and available computers/devices (i.e., they rated this "very good" to "excellent"). While some other sites reported that internet access, external storage, and available devices remain a persistent issue, the most-reported barriers to documentation and portfolio practices were (a) additional high-quality photo and video devices (61% of respondents rated the availability as "poor" or "good") with youth frequently using their own devices at a majority of sites; (b) the number of staff available to lead, develop, and support documentation (69% of respondents rated the availability as "poor" or "good"); (c) limited access to software that supports making and documentation (57% of respondents rated the availability as "poor" or "good"); as well as (d) other issues of professional development, including a need for greater knowledge about the methods and tools

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to support documentation (67% of respondents rated current knowledge as "poor" or "good").

Reported challenges to documentation mirror the challenges identified in our field site visits and outlined in our prior research briefs (see "Maker Portfolios in School" and/or "Maker Portfolios in Informal Education"). As one survey respondent reported, documentation "has not been as successful as we wished, but our time with our students is extremely limited and therefore it is difficult to have students be reflective about process as well as be a maker." Other challenges to open photographic documentation and public sharing of maker activities relate to complying with Federal Trade Commission (FTC) Children's Online Privacy Protection Act (COPPA, 2013). COPPA applies to the online collection and sharing of personal information of children under the age of 13. The new rules spell out what a website operator must include in a privacy policy, when and how to seek verifiable consent from a parent, and what responsibilities an operator has to protect children's privacy and safety online. Such restrictions are seen to hinder documentation, especially when not every guardian has been able to fully sign off on the publication and the collection of such data. Occasionally, these restrictions result in keeping documentation private to avoid potential issues.

Staff resources—such as the number of staff members, the capacity of staff to document youth work, and their level of experience with portfolios and technology— were the main areas that sites felt the need to improve on. Other resources fall under equipment for documentation, including hardware and software tools, better documentation practices, and motivations and value conceptions for documentation.

Fourteen percent (14%) of sites reported a general need for higher-quality equipment and easy-to-use tools that are integrated into the making process without distracting from making. In relation to hardware, sites mentioned the need for computers, iPod touches, iPads, tripods, as well as high-quality digital cameras and video and lighting equipment to improve the quality of the images during events. Also, sites mentioned the need for personal smartphones for on-the-fly documentation, as well as better internet access. Further, 5.9% of sites specifically pointed out the need for documentation stations to improve portfolio development at makerspaces. Here are three examples:

> I would like to establish a documentation table with a white background, lights, and a mounted camera, with an easy way to transfer the images to students' cloud-based storage accounts.

> A mobile documentation center where guests can walk up to it to easily document and share.

> A permanent and dedicated documentation station... would help.

In relation to software requirements to improve documentation practices, sites reported a need for platforms for youth and staff to build professional portfolios. The sites reported that these platforms should have easy and automated sharing and saving of journal entries, including steps like entering a name, taking a photo, and writing a sentence. Sites also noted the need for tools to keep track of student work over time. As videos of maker activities seemed to be popular, sites reported the need for simplified video production and post-production, especially in relation to shortening and simplifying the editing process. Further, sites required fast, age-appropriate, secure, and confidential online and cloud-based tools that provide youth with personal log-ins and access to private folders and accounts. Given the large number of youth who have personal smartphones, some of the sites reported the need for mobile applications, including software that automatically uploads pictures and videos to cloud-based storage. While many seek ways for integrating different tools and sharing documentation seamlessly across platforms, one space mentioned the need for a single platform or application.

In order for portfolio development and documentation of making to become part of the everyday activities and culture of the space, sites recommended developing a clear vision and message that address the value, purpose, goals, and long-term impact of portfolios. Further, it was suggested on several accounts that examples of appropriate and outstanding documentation might help others see why documentation is important and may lead to prioritizing documentation. We hope to address these needs within the community in our future work.

Conclusion

Overall, we find it promising that all 51 sites surveyed had thought about portfolios and documentation prior to our project. The vast majority noted that documentation was important to them, that feedback and reflection practices were crucial to youth's learning, and even that they already had a current system for documenting in place. The qualitative responses, however, revealed that though makerspaces across the nation see the value in portfolios and documentation, that importance does not always take precedence over day-to-day operations.

Portfolios, which are a long-term and multifaceted endeavor, require clear thought and planning, and a variety of both simple and complex obstacles stand in the way of immediate implementation. As we continue with this work, these barriers are important ones to consider. Some of the challenges relate to educators needing ideas and suggestions around facilitation practices and approaches, which can be addressed through professional development opportunities and exposure to successful examples of portfolio experiences. Other barriers relate to software and hardware questions, as well as more significant needs

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of staffing, capacity, and time. Ultimately, as we make the case for open portfolios being a valuable, authentic means of assessing learning, focusing in on these obstacles will pave the way to higher rates of adoption and more evidence for the importance of portfolios.

Acknowledgements

References

Federal Trade Commission (FTC) (2013). Children's Online Privacy Protection Act (COPPA). [public rule]. Retrieved from http://www.ftc.gov/enforcement/rules/rulemaking-regulatory-reform-proceedings/childrens-online-privacy-protection-rule

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