

Digital Badging in Museums:
An Exploration of Perceptions and Practice

Julie Woodard

Department of Museum Studies

The University of the Arts

December 2015

A thesis submitted to The University of the Arts in partial fulfillment of the requirements
for the degree of Masters of Art in Museum Education.

© Julie Woodard, 2015

© December 2015 Julie Woodard All Rights Reserved

No part of this document may be reproduced in any form without written permission of the author. All photographs and drawings are the property of Julie Woodard unless otherwise noted. Material owned by other copyright holders should not be reproduced under any circumstance. This document is not for publication and was produced in satisfaction of thesis requirements for the Master of Museum Education Program in the Department of Museum Studies, The University of the Arts, Philadelphia, Pennsylvania under the Directorship of Helen Shannon.

For more information contact:

Julie Woodard

1225 S. Carlisle Street

Philadelphia, PA, 19146

724-464-7837

julianawoodard@gmail.com

SIGNATURE PAGE

To the Faculty of The University of the Arts

The members of the committee appointed to examine the thesis of Julie Woodard find it satisfactory and recommend it to be accepted.

Date

Dec 7 2015



Paul Adorno

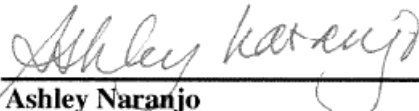
Committee Chair

Senior Advisor for Teaching, Learning and Innovation

Philadelphia Education Fund, Philadelphia, PA

Adjunct Assistant Professor in Art Education,

The University of the Arts, Philadelphia, PA



Ashley Naranjo

Learning Initiatives Specialist

Smithsonian Center for Learning and Digital Access, Washington, D.C.



Dustin Stiver

Program Officer

The Sprout Fund, Pittsburgh, PA



Helen Shannon

Program Director, Museum Studies The University of the Arts, Philadelphia, PA

TABLE OF CONTENTS

Acknowledgements	v-vi
Abstract	vii
Nomenclature	viii-ix
CHAPTER ONE: Introduction	1-21
The Growth of Digital Tools	1
Digital Badge History	4
Badges in the Classroom & Workforce	7
Badging in the Museum: Current Models	12
CHAPTER TWO: Review of the Literature	21-31
CHAPTER THREE: Methodology	32-33
CHAPTER FOUR: Presentation of Survey Findings	34-68
Survey Design	34
Demographic Summary	36
Current Issuers: Digital Badge Strategy in Practice	41
Current Issuers: Assessment and Perceptions	46
Potential Issuers: Foreseeable Plans	55
Potential Issuers: Assessment and Perceptions	58
Conclusion	67
CHAPTER FIVE: Case Studies	69-125
Introduction	69
Case Studies at a Glance	70
John G. Shedd Aquarium	71-85
History Colorado	86-100
Denver Art Museum	101-110
The Frick Art and Historical Center	111-117
Wagner Free Institute of Science	118-125
CHAPTER SIX: Conclusions	126-138
Introduction	126
Demographic Characteristics of Current and Potential Issuers	126
Badge Earner Audiences	127
Primary Goals	128

Intended Value for Earners	128
Perceived Challenges & Strengths of Digital Badges	129
Theoretical Concerns	132
Limitations of This Study	137
Conclusion	138
CHAPTER SEVEN: Applicability to the Museum Field	139-144
The Rise of Digital Culture	139
Clarifying a Badge's Intended Value for Earners	140
Collaborative Models	140
Third-Party Validation of Digital Badges	141
Increasing Accessibility through Digital Badging	141
Why Badging? Suggested Considerations	142
CHAPTER EIGHT: Implications for Further Research	145-149
Evaluation & Assessment Practices	145
Exploring the Badge Earner Perspective	145
The Value of Gamification	146
Badges for All?	147
Bibliography	150-155
Appendix A: Survey Instrument	156-160
Appendix B: Additional Graphs & Tables	161-163
Appendix C: Digital Badge Resources	164-165
Appendix D: Case Study Comparisons	166

LIST OF FIGURES

Figure 1: Respondents' Familiarity with Digital Badging	34
Figure 2: Current and Expected Badge Use	35
Figure 3: Current Issuers By Museum Type	41
Figure 4: Primary Way Current Issuers Use Badges	42
Figure 5: Primary Badge Audiences of Current Badge Programs	43
Figure 6: Primary Goals of Current Badge Programs	44
Figure 7: Intended Value Badges Offer Earners	45

Figure 8: Biggest Challenges Related to Digital Badges	47
Figure 9: Essential to Visitor Engagement Strategy	48
Figure 10: See Value but Lack Ability to Implement	48
Figure 11: Badges Are Nice to Have but Not Essential	49
Figure 12: Badges More Appropriate for Other Environments	50
Figure 13: Digital Badges are a Fad	51
Figure 14: How Badge Strategies can be Improved	52
Figure 15: Expectations of Future Badge Use	54
Figure 16: Foreseeable Way Badges Will be Used	55
Figure 17: Primary Audience for Future Badge Programs	56
Figure 18: Foreseeable Goals of Badge Programs	57
Figure 19: Value Badges Might Offer Earners	58
Figure 20: How Badge Strategy may be Improved	61
Figure 21: See Value but Lacks Ability to Implement	65
Figure 22: More Appropriate for Other Environments	65
Figure 23: Digital Badges are a Fad	66
Figure 24: Expectations of Future Badge Use	67
Figure 25: View of Shedd Aquarium's Badging Webpage	73
Figure 26: Example of a Teacher's Welcome Page	75
Figure 27: Example of a Badge Mission Description	76
Figure 28: Sample of Shedd Aquarium's Badge Icons	77
Figure 29: Sample of a Teacher's Management Page	88
Figure 30: Sample Online Exhibit Main Page	89
Figure 31: Sample of History Colorado's Badge Icons	91
Figure 32: Timeline Activity within a Digital Badge Quiz	92
Figure 33: Sample Multiple Choice Question with a Digital Badge Quiz	96
Figure 34: <i>Rover's</i> Basic Filters	102
Figure 35: Sample <i>Rover</i> Recommendation List	104
Figure 36: Sample Activity Description. <i>Source:</i> Denver Art Museum.	108
Figure 37: The Frick's iPad Bar	113
Figure 38: The Frick's Interactive Campus Map	114
Figure 39: Example of Wagner Certificate	121

Figure 40: The Wagner's Facebook Page	121
Figure 41: Primary Goals of Current & Potential Badge Programs	162

LIST OF TABLES

Table 1: Museum Types by Subgroups	36
Table 2: Position Titles by Subgroups	38
Table 3: Annual Budget by Subgroups	39
Table 4: Annual Visitors by Subgroups	40
Table 5: Rating Possible Challenges to Badge Implementation	53
Table 6: Biggest challenges related to digital badges by Subgroup	59
Table 7: How Badge Strategy in museums may be Improved	62
Table 8: Possible Challenges to Future Implementation	63
Table 9: AAM Museum Type Statistics	160
Table 10: AAM Annual Budget Statistics	160
Table 11: Possible Challenges to Badge Implementation	161

ACKNOWLEDGEMENTS

Firstly, I am grateful to my husband, whose off-the-cuff comment about digital badges over dinner one night, inspired me to delve into a completely alien topic.

Many thanks to my survey participants, as well as the following museum professionals who shared their time, candid perspectives, and knowledge: Laura Douglas, Digital Project Coordinator at History Colorado; Michelle Lim, Digital Engagement Programs Assistant, Melora McDermott-Lewis, Chief Learning Engagement Officer, and Josh Popke, Developer, all three of the Denver Art Museum; Miranda Kerr, Coordinator of Digital Learning at the Shedd Aquarium; Laura Beattie, Associate Curator of Education at the Frick Art and Historical Center; Cara Scharf, Program and Communications Manager at the Wagner Free Institute of Science; Sarah Coffey, Education Coordinator at the Dallas Museum of Art; Jennifer Bundy, Manager of the STEM Teen Community at the Adler Planetarium; and Allison Krisch Manager of Science and Community Programs at The Academy of Natural Sciences of Drexel University. Your contributions made this project possible!

Thank you to the following individuals and organizations that promoted my online instrument through Facebook and Twitter: The Museum Council of Greater Philadelphia; Elizabeth Merritt, Vice President, Strategic Foresight and Founding Director of the Center for the Future of Museums; Ashley Naranjo, Learning Initiatives Specialist at the Smithsonian Center for Learning and Digital Access; and Christina Cantrill, Associate Director of National Programs at the National Writing Project.

Many individuals offered valuable advice and graciously extended their support in the early stages of my research. Thanks to open badge trailblazer, Carla Casilli; Stacey

Mann, Learning, Digital Interpretation, & Exhibition Planning Consultant; Victoria Prizzia, Founder/President of Interpretive Space, LLC; Benjamin Olshin, Professor and Director of the School of Design at the University of the Arts; and Slavko Milekic, Professor of Cognitive Science & Digital Design at the University of the Arts. Additionally, I received pivotal assistance from Beth Frederick, Director of Institutional Research and Effectiveness at The University of the Arts, who helped me organize my data (and introduced me to the world of Pivot Tables).

I has been an honor to have the support and expertise of my thesis committee members: Paul Adorno, Senior Advisor for Teaching, Learning and Innovation at the Philadelphia Education Fund and Adjunct Assistant Professor in Art Education at The University of the Arts; Ashley Naranjo, Learning Initiatives Specialist at the Smithsonian Center for Learning and Digital Access; and Dustin Stiver, Program Officer at The Sprout Fund. This project has benefitted immensely from your critical feedback and ongoing encouragement.

Many thanks to my thesis course instructor and Director of Research and Evaluation at the Franklin Institute, Minda Borun. Finally, I would like to express my gratitude to my advisor and program director, Helen Shannon, for her continuous support of my graduate studies, and the development and writing of this thesis.

ABSTRACT

As technology continues to transform our ability to share and access information, the notion that learning can extend across multiple contexts and experiences is gaining traction. In response, tools like digital badges are emerging that recognize, capture, and assess the ways that people learn and participate in a variety of contexts. After providing a history of digital badges and an overview of related literature, this thesis explores the utility of digital badges within museums in the United States through the experiences and perceptions of museum professionals. Primary research methods include an online survey and case studies, and the following hypothesis is considered: While many barriers exist to adopting badges for pedagogical purposes, museums may find utility in badge strategies that focus more broadly on audience engagement. Theoretical and practical issues are explored, as well as implications for future research. Appendices of existing digital badge resources are also included.

NOMENCLATURE¹

Badging Platform: An online system for creating and issuing digital badges.

Certificate: An analogue credential that is awarded by an educational or other authorizing institution. Certificates generally verify that the instruction or training has been completed, but do not necessarily represent that the earner has acquired specific competencies. The terms “certificate” and “certification” are often confused.

Certification: An analogue record of an achievement that is awarded by a third-party, such as an industry or occupational association, based on an individual demonstrating through an examination or review process that they have mastered the required knowledge, skills, and abilities to perform a specific job or task.

Competencies: Areas of learning related to skills, knowledge, abilities, and/or dispositions.

Competency Badges: Digital badges that are earned through the attainment of specific skills, knowledge, or abilities that are both observable and measurable. They will also be referred to as *Pedagogically-focused Badges*, and describe badges that are implemented as a *pedagogical tool*.

Credential: An umbrella term that includes degrees, diplomas, certificates, badges, professional/industry certifications, apprenticeships, and licenses. Credentials vary in the awarding organization, the standards on which the award is based, and the rigor and type of assessment and validation processes used to attest to the skills, knowledge, and abilities people possess.

Digital Credential: A digitized version of an analogue, or paper-based credential.

Digital Badge: An online record of an individual’s achievements, interests, or participation. Unless otherwise denoted as an analogue badge, throughout this study, a digital badge will also be referred to as a *badge*.

Earners: An individual who attempts to attain a digital badge. The primary earners presented in this study are museum audiences.

¹ Because digital badges are a relatively new phenomenon, the way that badge-related terminology is applied and defined remains in flux. These definitions seek to describe their usage within the context of this thesis and are adapted from usages included within the literature on digital badging. Many also are adaptations of terms presented within “Clarifying Competency Based Education Terms” by the *American Council on Education* and *Blackboard*. This resource is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License. Reuse and remix, with attribution, is encouraged.¹

Extrinsic Motivator: Factors external to the individual and often unrelated to the task they are performing. An individual may be extrinsically motivated to perform an action or behavior in order to receive an external reward or outcome. Examples include money, good grades, and other tangible rewards.

Gamification: The concept of applying game mechanics and game design techniques to non-game contexts. By leveraging people's desires such as achievement, competition, status, and collaboration, gamification techniques are intended to engage and motivate people to participate in a specific activity.

Intrinsic Motivator: Factors internal to an individual that drive their desire to perform a task, activity or behavior. An individual may be intrinsically motivated to perform an action or behavior for the sake of personal enjoyment or edification.

Issuer: An organization, institution or entity that creates and issues digital badges. The primary issuers presented in this study are museums.

Motivator: Something that energizes, directs, and sustains behavior.

Participation Badges: Digital badges that are earned through one or more forms of engagement, such as event attendance, contributing content, or sharing information. They will also be referred to as *Participatory Badges* and *Engagement Badges*. Participation Badges stand in contrast to *Competency Badges*, which are earned through the development of measureable skills, knowledge, or abilities.

Portfolio: A compilation of a learner's work that is assembled in order to evaluate the quality of one's academic or artistic achievement, create an archive of academic or creative work examples, or provide a collection of evidence.

Stakeholders: Entities that validate the value of what a specific digital badge represents. They may include educational institutions, employers, and funders. Badge advocates also refer to stakeholders as *Consumers*.

Validation: Refers to the ways stakeholders in an educational ecosystem determine the value of components in that ecosystem, particularly the credibility of a credential earned by issuers.

CHAPTER ONE: INTRODUCTION

The Growth of Digital Tools

Throughout the last hundred years, there has been a strong emphasis on formal classroom learning in the United States. When the compulsory public education movement began in the 1920s, it signified the push for an educational system with a common curriculum, grades, and standardized tests. Today, however, there is a growing recognition that these educational environments do not have a monopoly on learning, and that the breadth of an individual's knowledge, skills, and experiences cannot be articulated within a transcript. Additionally, formal classrooms may not be the best place to foster and access 21st century skills, such as collaboration, digital media literacy, and innovative thinking.² As technology continues to transform our ability to share and access information, the notion that learning can extend across multiple contexts and experiences is gaining traction.³ In response, new digital tools and resources are emerging that recognize, capture, and assess learning.

One increasingly popular tool takes the concept of a badge, an object that symbolizes or indicates a competency, accomplishment, quality, or interest and

² The Partnership for 21st Century Learning, which has created a useful framework for articulating and measuring skills and knowledge related to 21st century learning. To learn more, visit: <http://www.p21.org/our-work/p21-framework>

³ Following museum scholars John Falk and Lynn Dierking's characterization of the term, I will consider "learning" to be both a noun and verb, and a "process/product of the interaction between three contexts," namely, "the personal, the sociocultural, and the physical." John H. Falk and Lynn D. Dierking, "The Contextual Model of Learning." *Learning from Museums: Visitor Experiences and the Making of Meaning*. Walnut Creek, CA: AltaMira Press, 2000.

transforms it into a digital object that proponents argue, can carry significant value.⁴

From insignia used by armies, to coats of arms worn by families, to adornments carefully sewn onto Girl Scouts sashes, analog badges have served as physical representations of honor, privilege, survival, and experience.⁵ Digital badges are similarly complex, as there is a range of applications and theoretical approaches to their design and use. Erin Knight, a leading scholar in the field of digital learning defines a digital badge as “an online record of achievements, tracking the recipient’s communities of interaction that issued the badge and the work completed to get it.”⁶ In other words, a digital badge is an icon that is loaded with metadata that links to tangible documentation, such as digital portfolios of work, recommendations, and other related content that validates that the participant has earned the badge. Depending on the type of badge, this metadata may indicate an earner’s interests, participation, knowledge, skills, or dispositions.

Some digital badges are intended to be shared through icons on professional network profiles, such as LinkedIn, where they may enhance a traditional resume, others are meant to be displayed within an email signature, as one might list a degree or credential after their name. Similar to a portfolio, the metadata linked within the badge may provide a more comprehensive picture of a one’s skills and experience and boost an earner’s competitiveness when pursuing educational and employment opportunities.

⁴ Diana G. Oblinger, “Case Study 6: Mozilla Open Badges,” *Game Changers: Education and Information Technologies*, EDUCAUSE (2012): 279.

⁵ Alexander M.C Halavais, "A Genealogy of Badges," *Information, Communication & Society* 15, no. 3 (April 2012): 354-373.

⁶ Mozilla Foundation and Peer 2 Peer University, in collaboration with The MacArthur Foundation, “Open Badges for Lifelong Learning” (2011), accessed January 7, 2015, https://wiki.mozilla.org/images/b/b1/OpenBadges-Working-Paper_092011.pdf.

Other badges may be stored internally within the community or context where they were issued, such as a university course, an organization’s internal website for employees, or a museum membership group. Institutions often utilize third-party badge platforms, such as BadgeOS, Credly, and Youtopia, which allow them to create and manage customizable badge systems that can connect to the issuer’s existing website. Some of these services are free, but many also offer enhanced fee-based packages. These platforms often provide a way for badge earners to login, manage their own account and share and display their badges through social media.⁷

While badge metadata is valuable to the earner, in some cases it may be of even greater utility to the issuer. The information embedded within the digital badge may provide an issuer with meaningful insights about its constituents that can have an impact on curricula, job training practices, and programming. In turn, the badge earner may receive “rewards” from the issuer, such as recognition from a teacher, a special benefit at work, or free museum admission. These examples allude to one of the primary areas of contention around digital badges: the lack of a shared understanding of what a digital badge is, how it should be used, and the purposes it serves. For badge proponents, the freedom to shape a badge to fit the needs of a unique group of learners is one of the most valuable components of a badging system. Skeptics, however, suggest this openness may cause confusion; they argue that standardization is required in order for digital badges to develop into a valid tool.

Although there is a growing interest in digital badges as an emerging field, little research has been conducted to assess their long-term viability and usefulness. Still, digital badge programs are surfacing in schools, work places, and informal learning

⁷ For a list of resources related to badge platforms, see Appendix C on page 163-164.

environments that include this thesis's primary focus: museums in the United States. While many barriers exist to adopting badges for pedagogical purposes, museums may find utility in badge strategies that focus more broadly on audience engagement. This assertion will be explored throughout the literature review and research findings, but first, it is useful to recognize what factors and forces gave rise to the digital badge movement.

Digital Badge History

The emergence of a digital badge ecosystem is due in part to the Open Educational Resources (OERs) movement. Learning management systems such as Credly, Badge Stack, and Mozilla's Open Badges initiative offer free platforms for verifying, sharing, and managing digital badges and credentials online.⁸ While serving as the Senior Director of Learning at the Mozilla Foundation, Erin Knight developed Mozilla Open Badges, a free and open online infrastructure that allows any organization to create, issue, and verify digital badges.⁹ In 2011, she authored "Open Badges for Lifelong Learning," a white paper that presented digital badges as a way to translate, formalize, and enhance learning across social, educational, and professional contexts.¹⁰ One of the earliest writings on the topic, this white paper has been widely cited throughout the literature. Knight went on to lead the Badge Alliance, "a network of organizations and individuals working together to build and support an open badging

⁸ For more information about these Open Educational Resources, visit: <https://credly.com/>, <http://badgeos.org/badgestack/>, and <http://openbadges.org/>.

⁹ "About," *ErinKnight.com*, accessed January 25, 2015, www.erinknight.com.

¹⁰ Mozilla Foundation and Peer 2 Peer University, in Collaboration with The MacArthur Foundation, "Open Badges for Lifelong Learning" (2011), accessed January 7, 2015, https://wiki.mozilla.org/images/b/b1/OpenBadges-Working-Paper_092011.pdf.

ecosystem, with a focus on shared values including openness, learner agency and innovation.”¹¹

Even as a leader in the field, Knight acknowledges that “badges are not a silver bullet” and may not be appropriate for all learners and contexts, but insists “we’ve still got to do the work” to determine if and how digital badges may help to provide new opportunities for learning.¹² “Doing the work,” in a new field often translates to experimentation and grant-funded pilot projects. A leading source of support for badge initiatives has been the Digital Media and Learning (DML) Competition, which was supported by the John D. and Catherine T. MacArthur Foundation through a grant to the University of California, Irvine, and administered by the *Humanities, Arts, Science, and Technology Alliance and Collaboratory* (HASTAC).¹³ Over the last five years, this competition awarded \$10 million to more than 100 projects that explore how digital technology affects learning and the way individuals “learn, play, socialize and participate in civic life.”¹⁴ The 2012 competition focused specifically on digital badges and funded thirty badging projects.

¹¹ “About,” *The Badge Alliance*, accessed January 25, 2015, <http://www.badgealliance.org/about/>.

¹² Erin Knight, “More Beefs,” *ErinKnight.com*, accessed January 25, 2015, <http://erinknight.com/post/82103788980/more-beefs>.

¹³ HASTAC (the Humanities, Arts, Science, and Technology Alliance and Collaboratory) is an international network of educators and digital visionaries committed to the creative development and critical understanding of new technologies in life, learning, and society. HASTAC is committed to innovative design, participatory learning, and critical thinking. <http://www.hastac.org/>.

¹⁴ “About the Digital Media and Learning Competition,” *HASTAC*, accessed December 17, 2015, <http://dmlcompetition.net/about/>.

In October 2015, the MacArthur Foundation announced the launch of *Collective Shift*, a new nonprofit that seeks to “redesign social systems for the connected age.”¹⁵ *Collective Shift* is being led by Connie Yowell, the former Director of Education at MacArthur, and Jessica Lindl, the former Executive Director of GlassLab, the game development and research organization.¹⁶ Initially, the organization will focus on expanding the MacArthur supported “Cities of Learning” initiatives in Chicago, Dallas, Pittsburgh, and Washington, DC, and will continue to develop partnerships with schools, businesses, and institutions in these communities.¹⁷ The work of the Badge Alliance is being folded into *Collective Shift* and the Mozilla Foundation is a key partner. *Collective*

<http://www.macfound.org/press/press-releases/digital-media-learning-competition-provides-2-million-for-innovations-in-digital-badges/>.

¹⁵ “MacArthur Spins Off Digital Media & Learning Work with \$25 Million Seed Investment,” *The MacArthur Foundation*, October 6, 2015, accessed October 10, 2015, <https://www.macfound.org/press/press-releases/macarthur-spins-digital-media-learning-work-25-million-seed-investment/#sthash.ZdZM3YxU.dpuf>.

¹⁶ “LRNG,” *Collective Shift*, accessed October 22, 2015, www.lrng.org.

¹⁷ The Cities of Learning movement began in 2013 as “an effort to network citywide resources to keep youth ages 4 to 24 engaged in educational and career opportunities when school lets out. Cities of Learning offer free or low-cost opportunities for youth to learn online or participate in programming at parks, libraries, museums and other institutions. Whether through robotics, fashion design, coding competitions or workplace internships, Cities of Learning provide an array of engaging opportunities for young people to explore new interests, develop their talents, and create unique pathways toward college or a career. Local funding and logistical support for each City of Learning are provided by broad and often unprecedented coalitions, bringing together cross-sector partners such as the mayor’s office, the school district, nonprofits, institutional funders and out-of-school educational providers.” This description was sourced from the Open Badges Tumblr page, “6 Big U.S. Cities Launch Year Round CityWide Learning Initiatives Offering Digital Badges for Youth,” *Open Badges*, accessed December 8, 2015, <http://openbadges.tumblr.com/post/88478999669/6-big-us-cities-launch-year-round-citywide>. As noted, Cities of Learning is now a part of *Collective Shift*’s LRNG program. While the website content is still in development, future details about this will be available at <https://www.lrng.org/cities>.

Shift's first project is LRNG, a social enterprise and badge platform that “redesigns learning for the 21st century so that all youth have the opportunity to succeed.”¹⁸ The LRNG platform acknowledges that learning can happen anywhere and will focus heavily on digital badging, mentorship and applying skills to real-world contexts.¹⁹

In summary, OERs, an alliance of badge advocates, and new funding opportunities are motivating many organizations to explore and issue digital badges. However, there are additional stakeholders that are enabling this movement to advance.

Badges in the Classroom & Workforce

When Arne Duncan, Secretary of the U.S. Department of Education spoke at the 2011 launch of the MacArthur Foundation's Digital Media and Lifelong Learning Competition, “Badges for Lifelong Learning,” he signaled a message in support of badges at the federal level.²⁰ Duncan asserted:

As we recognize multiple ways for students to learn, we need multiple ways to assess and document their performance. Students, teachers and administrators are hungry to move beyond fill-in-the-bubble tests, toward assessments that are more varied, immediate, and data-rich. Digital badges are an important step in this direction. And, badges offer an important way

¹⁸ Chris Lawrence, “Mozilla Learning Network and LRNG” October 10, 2015, accessed October 15, 2015, <http://www.clawrence.org/2015/10/10/mozilla-learning-network-and-lrng/#sthash.Weozk6vt.dpuf>.

¹⁹ Benjamin Herold and Leo Doran, “MacArthur Foundation Launches Nonprofit to Scale Up Digital Learning,” *Education Week*, Oct 21, 2015, accessed October 22, 2015, <http://www.edweek.org/ew/articles/2015/10/21/macarthur-foundation-launches-nonprofit-to-scale-up.html>.

²⁰ Arne Duncan, “Digital Badges for Learning,” Remarks by Secretary Duncan at 4th Annual Launch of the MacArthur Foundation Digital Media and Lifelong Learning Competition, September 15, 2011, accessed January 20, 2015, <http://www.ed.gov/news/speeches/digital-badges-learning>.

to recognize non-traditional ways of learning. They're a way to give credence – and ultimately, credit – for the skills learners and teachers acquire in a broader set of learning environments, and a wider range of content. . . . By promoting badges and the open education infrastructure that supports them, the federal government can contribute to the climate of change that the education, business and foundation sectors are generating. We can build new avenues for entrepreneurship and collaboration, and spark economic development at home and around the world.

Later in his address, Duncan announced that the Department of Veterans Affairs Innovation Initiative would partner with Mozilla, the MacArthur Foundation, and the Departments of Education and Labor to support and sponsor a new "Badges for Heroes Challenge" and award \$25,000 to the strongest digital badge concept that assists veterans in finding meaningful employment. The winning project, *Badges Work for Vets*, is a veteran-run online initiative that seeks to translate military training and experience to civilian skills accessible to potential employers. Veterans can search through a job database and create digital badges that serve as a virtual resume on the *Badges Work for Vets* website. In turn, employers can post jobs and search through the badges database to identify qualified veterans for their needs.²¹

More recently in 2013, former President Bill Clinton announced the Clinton Global Initiative (CGI) Commitment to Action to expand access to Open Badges in an effort to "improve the futures of two million students and U.S. workers."²² A partnership with Mozilla, The Badge Alliance, The MacArthur Foundation, and HASTAC, the CGI commitment provides employers and universities throughout the United States with

²¹ "Badges for Vets," accessed March 15, 2015, <https://badgesforvets.org/>.

²² "Better Futures for 2 million Americans Through Open Badges," *The MacArthur Foundation*, accessed March 15, 2015, <http://www.macfound.org/press/press-releases/better-futures-2-million-americans-through-open-badges/>.

planning and design support as they attempt to incorporate Open Badges in the areas of hiring and recruitment, staff promotions, university admissions, and academic credit. Early adopters include educational technology companies like Blackboard, The Corporation for Public Broadcasting, New York City's Department of Education, Disney-Pixar, and DePaul University.²³ In a June 2014 progress report, CGI announced that due to its initial momentum, it will expand its commitment to reach 10 million lives in two years, and has created a series of ambitious benchmarks. Importantly, by June 2016 CGI anticipates that:

- Sixteen universities are issuing or accepting badges.
- Five large school districts and associated after-school programs are issuing or accepting badges.
- Twenty large employers are issuing or accepting badges.
- At least two industry groups are using badges as part of their credentialing.²⁴

While its goals have yet to be evaluated, the Commitment to Action illustrates a central argument proposed by badge advocates, namely, that traditional credentials do little to reflect the complexity of an individual's experience and knowledge, whereas the metadata associated with a digital badge provides tangible evidence of a finer granularity of skills.²⁵ Badges then, can provide a stakeholder, such as a potential employer, with a

²³ "Participating Issuers," *Mozilla Open Badges*, accessed April 28, 2015. <http://openbadges.org/participating-issuers/>.

²⁴ "Digital Badges: Unlocking Two Million Better Futures," *The Clinton Foundation*, accessed April 5, 2015, <https://www.clintonfoundation.org/clinton-global-initiative/commitments/digital-badges-unlocking-two-million-better-futures>.

²⁵ June Ahn, Anthony Pellicon, and Brian S. Butler, "Open badges for education: what are the implications at the intersection of open systems and badging?" *Research in Learning Technology*, vol. 22 (2014), doi: <http://dx.doi.org/10.3402/rlt.v22.23563>.

more nuanced view of an individual's skills and experience. Considering the role badges may play within higher education, Erin Knight asserts, "Degrees aren't going away, but there are breakdown opportunities for postsecondary institutions that can provide a more cohesive picture of the learning experience."²⁶

Many colleges and universities are exploring these "breakdown opportunities" through badge programs, for applications both in and out of the classroom. For instance, faculty at Purdue University are exploring how digital badges can be a way for their institution to capture learning that extends beyond the academic transcript or resume, provide meaningful insight into how students learn, and impact classroom instruction. Through an app called *Passport*, faculty can build badges that align with their curriculum and provide alternative ways for students to demonstrate skills and competencies far beyond the constraints of traditional grades and assessments.²⁷ Similarly, Carnegie Mellon University's Computer Science Student Network (CS2N) awards badges to students through the process of developing computer-science knowledge and skills.²⁸ Duke University, The University of California, MIT, and Indiana University are among the other institutions that are exploring how digital badges can enhance and transform classroom learning.

²⁶ Kyle Bowen and Andrea Thomas, "Badges: A Common Currency for Learning," *Change* 46, no. 1 (January 2014): 23.

²⁷ Kyle Bowen and Andrea Thomas, "Badges: A Common Currency for Learning," *Change* 46, no. 1 (January 2014): 21-25.

²⁸ Samuel Abramovich, Christian Schunn and Ross Mitsuo Higashi, "Are badges useful in education?: it depends upon the type of badge and expertise of learner," *Educational Technology Research and Development* vol. 61, no. 2 (2013): 219.

Students in the Sustainable Agriculture & Food Systems (SA&FS) at The University of California, Davis will soon be earning badges that recognize their learning both in and out of the classroom. The badges are based on seven core competencies: systems-thinking, experimentation and inquiry, understanding values, interpersonal communications, strategic management, civic engagement and personal development. A student demonstrates his or her competency in systems-thinking, for example, by looking at a complex issue through the lenses of sociology, economics, and environmental sustainability.²⁹ To earn a badge, a student might collect soil samples from the student farm, perform a series of tests on mulch treatments, and document his or her findings in a report that integrates a systems-thinking approach.³⁰ Students will have an active role in defining the criteria for the badges, participate in self and peer assessment, and are encouraged to design new badges based on their interests. As Joanna Normoyle, Learning Coordinator, Experiential & Digital Media Learning, at UC Davis notes:

We focused our badging system on the process of earning a badge, rather than the badge itself. Our badging system is directly in line with John Dewey's thinking that learning is not so much about the experience - we know that learning happens everywhere, all the time, it's in the classroom, in the field, with an organization and so on - but rather, it's the quality of the reflection the student has in response to that experience . . . In our system, it's up to students to choose which experiences are relevant and to make sure they get recognition for what matters to them. I think it's what makes the reflection meaningful; it's what connects them to their experiences in deep and lasting ways.³¹

²⁹ Paul Fain, "Badging From Within," *Inside Higher Ed* January 3, 2014, accessed April 5, 2015, <https://www.insidehighered.com/news/2014/01/03/uc-daviss-groundbreaking-digital-badge-system-new-sustainable-agriculture-program>.

³⁰ Ibid.

³¹ "Open Badges Case Study: UC Davis Sustainable Agriculture & Food Systems" *Mozilla Foundation and HASTAC* (2014), accessed April 5, 2015,

The badge program was piloted within a senior capstone course in 2014, and Normoyle and her team anticipate a full launch within the coming months.

Employers are also utilizing badges as a way to create and motivate their employee's engagement in training and professional development opportunities. When Deloitte incorporated digital badges into its online learning environment, Deloitte Leadership Academy, the company saw a 50 percent increase in participation among its employees.³² Over 200 badges are offered on the site that recognize small accomplishments, such as completing an online orientation or personalizing a homepage, as well as participation, which might include watching videos, posting comments about the site's content, and creating status updates. Some of the motivation for use is due to the inclusion of game-based elements, such as digital leader boards and badges. Speaking to the Association for Talent Development's Pat Galagan,³³ Deloitte's Digital Partner Jason Bender noted that "the badges are built to encourage the questing and exploration that drives learning." In order for the strategy to be sustainable, Bender asserts, "You must monitor, measure, and adapt the site continually to keep the learning process engaging. You must create value, not just points."³⁴ Not only are governmental agencies,

http://www.reconnectlearning.org/wp-content/uploads/2014/01/UC-Davis_case_study_final.pdf.

³² Pat Galagan, "Playing Nice," *TD: Talent Development* 68, no. 9 (2014): 24-26.

³³ The Association for Talent Development (ATD) is a global membership organization that supports the talent development (TD) profession by providing research, publications, events and opportunities that help TD practitioners to foster the development of knowledge and skills among their employees. Pat Galagan is ATD's editor-at-large. For more information about ATD, visit: <https://www.td.org>.

³⁴ Pat Galagan, "Playing Nice," *TD: Talent Development* 68, no. 9 (2014): 24-26.

universities, and corporations issuing digital badges, museums are also exploring if and how they fit into the larger digital badge ecosystem.

Badging in the Museum: Current Models

Recognizing that a central approach to museum learning centers on experiences that are free-choice, scaffolded, and enable personal meaning-making,³⁵ it seems appropriate that digital badges are becoming a part of the discourse around how museums can engage visitors. Former Director of Digital Learning at the Museum of Modern Art, Deborah Seid Howes recognizes the way that developments in technology, specifically the Internet, have impacted museums' abilities to engage audiences. She asserts, "Museums must broaden their institutional focus beyond an organization rooted in an exclusive place in real time to a ubiquitous source of around-the-clock educational experiences."³⁶ As we shall see, some badge strategies extend or replace the museum visit with the virtual realm.

In the museum field, several units within the Smithsonian Institution have piloted digital badge projects, and each is taking a different approach. One of earliest museum badging projects was developed by the Smithsonian Center for Learning and Digital Access (SCLDA). The center's comprehensive online resources include lesson plans, a resource library, games, and other digital learning tools that provide teachers, students,

³⁵ John H. Falk and Lynn D. Dierking. *Learning from Museums: Visitor Experiences and the Making of Meaning*, Walnut Creek, CA: AltaMira Press, 2000.

³⁶ Deborah Seid Howes, "Why the Internet Matters: A Museum Educator's Perspective," In *The Digital Museum: A Think Guide*, ed. Herminia Din and Phyllis Hecht, Washington, DC: American Association of Museums, 2007, 77.

and families access to the Smithsonian’s collections and resources. Launched in 2012, *Smithsonian Quests* utilized SCLDA’s rich digital content to offer “digital badging for the classroom and beyond.”³⁷ The initiative was created in response to feedback provided by middle school teachers who participated in SCLDA webinars, and who expressed the desire to provide their students with project-based activities that incorporated elements of evidence, reflection, and feedback. As participating students complete specific learning activities, or “Quests,” they would submit content and receive real-time feedback within forty-eight hours from a trained teacher or evaluator. The program encouraged badge earners to identify new learning pathways and to enrich their classroom and home learning through virtual experiences with Smithsonian collections and themes.³⁸ SCLDA developed content, provided manual assessment, and maintained its own badging platform. After a three year pilot, SCLDA has “hit pause” on *Smithsonian Quests* to take a critical look at its role within the badging landscape. In the future, SCLDA expects its involvement in badging will focus on its primary strength: content creation.³⁹ In the meantime, much of the *Smithsonian Quests* content is available through a new project, the *Smithsonian Learning Lab*, “a major rethinking of how the digital resources from across the Smithsonian’ 19 museums, 9 major research centers, the National Zoo, and

³⁷ “Welcome,” *Smithsonian Quests*, accessed February 2, 2015, <http://smithsonianquests.org/>.

³⁸ Interview with Ashley Naranjo, Learning Initiatives Specialist at the Smithsonian Center for Learning and Digital Access. March 13, 2015.

³⁹ Phone conversation with Ashley Naranjo, Learning Initiatives Specialist at the Smithsonian Center for Learning and Digital Access. November 25, 2015.

more, can be used together, for learning.”⁴⁰ While SCLDA’s initiatives focus on distance and online learning, other museums within the Smithsonian are issuing badges through onsite programs.

In response to the lack of strong arts curricula in public high schools, the Cooper Hewitt Smithsonian Design Museum developed *DesignPrep*, a free workshop series where teens can explore a range of design disciplines, including web development, fashion design, and architecture. This project was funded by a DML Competition grant, described previously. Participatory badges are earned through reflective writing activities or by documenting design projects online, while skill-based badges require an earner to demonstrate his or her mastery of specific technical abilities. Design professionals mentor the students and access their work, and badges can lead to rewards, such as special trips and design internships. In addition to gaining meaningful skills and experience, *DesignPrep* provides students with the opportunity to build a portfolio of work that can be submitted to university design programs or potential employers. Notably, professional associations such as the Council of Fashion Designers of America (CFDA), The American Institute for Graphic Arts (AIGA), and The Association of Independent Colleges of Art and Design (AICAD) are considering accrediting some of these digital badges, which would likely increase the badges’ validity within the design community.⁴¹ For instance, a badge accredited by a recognizable third-party, such as AIGA may

⁴⁰ “Smithsonian Learning Lab” *Smithsonian Center for Learning and Digital Access.*, accessed November 25, 2015, <https://learninglab.si.edu/about>.

⁴¹ Naranjo, Ashley (Learning Initiatives Specialist at the Smithsonian Center for Learning and Digital Access). Interview by Julie Woodard, March 13, 2015. This description was also informed by a document provided by Naranjo, “Cooper Hewitt Case Study” *The Smithsonian Institution*, 2014.

possess more social currency than a badge that has only been internally assessed by the badge issuer. An AIGA-certified badge could communicate a strong message of support to stakeholders within the design community. Accreditrust is a company that provides independent, third-party certification of digital badges. Eric Korb, Accreditrust's president and CEO asserts, "Like any currency, badges must be validated to ensure their validity. It is essential for stakeholders — including hiring managers, educators, government entities and procurement executives — to possess a high degree of confidence that a digital badge is authentic."⁴²

While a primary focus of *DesignPrep* is college readiness, the Hirshhorn Museum and Sculpture Garden's *ARTLAB+* program takes a different approach. This drop-in afterschool program invites teens to explore and develop specific skills related to digital media while being mentored by professional artists from fields such as photography, sound design, film, and animation. Although this program does not implement digital badges, it issues certifications, which are somewhat similar.⁴³ Certifications are a record of an achievement that is awarded by third-party, in this case, the Hirshhorn Museum and Sculpture Garden. Through a review or assessment process, an individual demonstrates

⁴² Rhea Kelly, "New Company Offers Third-Party Validation of Digital Badges," *Campus Technology*. January 6, 2014, accessed April 29, 2015, <http://campustechnology.com/Articles/2014/01/06/New-Company-Offers-Third-Party-Validation-of-Digital-Badges.aspx>.

⁴³ As described on the *ARTLAB+* program's website, "Certifications are developed by Mentors as a way for teens to become intrinsically motivated to achieve within their interests in digital mediums. In addition to displaying a specific set of skills, these certifications encourage teens to use their critical thinking. Certifications are tracked internally by the program and conversations occur between Mentors and teens to encourage teens to use their acquired certifications to help them get into college or apply for jobs. When applicable, the *ARTLAB+* program also incorporates professional standards into our certification tests and aligns them to Common Core Standards." "Certifications," *ArtLab+*, accessed November 24, 2015, <http://artlabplus.si.edu/>.

that they have mastered the required competencies to perform a specific role or task. Some of *ARTLAB+*'s certifications are earned without trying to earn them, but rather an outcome of the self-directed learning. A student exploring photography, for instance, might have to demonstrate his or her skills and mastery of a point and shoot camera before being able to work with a DSLR camera. In other words, the certifications are not a primary motivating factor that drives participation. Rather, it is a process; as participants demonstrate their ability or knowledge of a specific skill or tool, they are then certified to take their learning to the next level. Some *ARTLAB+* participants pursue professional opportunities within these skills sets, and several have established side businesses. In at least one digital media project, a Smithsonian unit was a client.⁴⁴

At the National Museum of Natural History (NMNH), badges are used as a tool to enhance a visitor's experience within *Q?rius*, a new interactive space on the ground floor of the museum. Visitors are invited to take a card with a QR code on it. This "Q-card" provides information about how the visitor can scan and register his/her card on one of the many computers situated within the lab. After registering, visitors can use their Q-card to save objects and media to a virtual "Field Book." Many object-specimens from the NMNH collection, which were previously not accessible to the public, are now placed in clear boxes that are situated within drawers and cabinets that visitors can access and explore. Each item is outfitted with a tag that can be scanned on a nearby screen to learn more about the object. By scanning one's registered Q-card, the visitor can add the item and the associated content, such as videos and images, to their virtual collection. Visitors

⁴⁴ Naranjo, Ashley (Learning Initiatives Specialist at the Smithsonian Center for Learning and Digital Access). Interview by Julie Woodard, March 13, 2015. This description was also informed by a document provided by Naranjo, "Art Lab Case Study" *The Smithsonian Institution*, 2014.

can also earn digital “Stars” and “Badges” by watching videos, taking quizzes, and participating in science-based activities that are offered at stations throughout the lab. After a visit, visitors can log in to their *Q?rius* account from home, review and manage their “Field Book,” and participate in additional activities online.⁴⁵

The *DMA Friends* program at the Dallas Museum of Art exemplifies a badging strategy that seeks to engage audiences while simultaneously collecting useful visitor data. In 2013, *DMA Friends* was launched in tandem with the announcement that the museum would now offer free admission. Visitors join the program by signing up for an account via their phones, or at iPad kiosks located in the museum. They are then able to participate in a variety of activities that are intended to provide creative ways to connect with the museum’s programs and collections. By scanning their membership cards at kiosks or texting from their phones, visitors can “check in” to activities. As activities are completed, visitors can earn badges that they can then use to claim rewards, such as free parking and behind-the-scenes tours. Within the first week, 1,500 visitors registered for Friends cards; 5,300 check-ins were recorded; 90 rewards were claimed; and 3,150 badges were earned by *DMA Friends* participants.⁴⁶ This model integrates elements of gamification, which design theorists define as “the use of game design elements in non-

⁴⁵ The description of the *Q?rius* badge program is based on my observations and experiences as a visitor to National Museum of Natural History in Washington, DC on March 13, 2015.

⁴⁶ Robert Stein and Bruce Wyman, “Nurturing Engagement: How Technology and Business Model Alignment can Transform Visitor Participation in the Museum.” In *Museums and the Web 2013*, N. Proctor & R. Cherry (eds). Silver Spring, MD: Museums and the Web, January 31, 2013, accessed March 18, 2015, <http://mw2013.museumsandtheweb.com/paper/nurturing-engagement/>.

game contexts.”⁴⁷ Museum leaders assert that the gaming aspect is a byproduct of engagement, rather than its focus, and that it may serve as a familiar point of reference for new visitors.⁴⁸ Robert Stein and Bruce Wyman, the designers of *DMA Friends*, note that a primary goal of the program is “to create long-term relationships with visitors while offering them value and benefits tailored to their experience and engagement with the museum. This long-term connection and repeat participation is seen as key to establishing the hoped-for relevance of the museum in the lives of visitors.”⁴⁹ As of early 2015, *DMA Friends* exceeded 90,000 members and saw an average of 700 new members each week.⁵⁰ Similar to a consumer reward program that tracks and rewards a customer’s buying habits, *DMA Friends* monitors and motivates its participants. By sharing information about their museum experience, Friends receive free admission and the opportunity to earn additional benefits through badges. Ideally, this visitor information will help to inform and enhance the ways in which the museum can serve its audience, from programming and exhibitions, to cultivating a community of loyal participants. The

⁴⁷Sebastian Deterding, Dan Dixon, Rilla Khaled, and Lennart Nacke. 2011. “From game design elements to gamefulness: defining ‘gamification.’” In *Proceedings of the 15th International Academic MindTrek Conference: Envisioning Future Media Environments*. MindTrek 2011, New York, NY: Association for Computing Machinery, 9.

⁴⁸ Robert Stein and Bruce Wyman, “Nurturing Engagement: How Technology and Business Model Alignment can Transform Visitor Participation in the Museum.” In *Museums and the Web 2013*, N. Proctor & R. Cherry (eds). Silver Spring, MD: Museums and the Web, January 31, 2013, accessed March 18, 2015, <http://mw2013.museumsandtheweb.com/paper/nurturing-engagement/>.

⁴⁹ Ibid.

⁵⁰ Robert Stein et al., “Scaling up: Engagement platforms and large-scale collaboration,” *MW2015: Museums and the Web 2015*, January 30, 2015, accessed April 14, 2015, <http://mw2015.museumsandtheweb.com/paper/scaling-up-engagement-platforms-and-large-scale-collaboration/>.

DMA Friends badging platform is now being piloted within other museums, including the Denver Art Museum, the Los Angeles County Museum of Art, and the Minneapolis Institute of Arts. While these initiatives are currently in various stages of implementation, they are all funded through a shared National Leadership Grant awarded by the Institute of Museum and Library Services.⁵¹

The field has also experimented with using badges to recognize participation among museum professionals at conferences. For example, in 2012-2013, The Museum Computer Network partnered with LearningTimes, a company that creates innovative online learning programs, and Credly to offer digital badges through MCN Pro, an online workshop series for professionals in arts and cultural institutions. Workshop attendees earned badges to acknowledge their participation, while presenters received a badge that recognized their expertise in a subject. The badging project was promoted with the phrase, “The more you learn, the more you earn.”⁵²

These examples illustrate how museums are utilizing badges in a variety of ways. On one hand, the adaptability and experimentation that the current open badge framework allows may be perceived as beneficial, as each institution is adopting the digital strategy and modifying it to serve its individual needs. At the same time however, this may add to the confusion that exists regarding a badge’s ability to carry a common currency. Should badges function as an engagement strategy, a pedagogical tool, or a certification? It is not yet clear if badges will require a singular function and set of standards in order for a badge ecosystem to be sustainable and widely used within

⁵¹ Ibid.

⁵² “Museum Computer Network Announces MCN Workshop Series in Partnership with Learning Times,” *Learning Times*, accessed January 19, 2015, <http://www.learningtimes.com/news/mcn-museum-series/>.

museums. However, it might be valuable to develop a classification system that distinguishes among the different types of badges and their goals. On a practical level, this researcher feels it is worth noting that among the museums that have begun experimenting with badges, most are large, well-funded institutions that have the staff and financial capacity to pursue an initiative that carries a certain amount of risk.

In summary, while these are useful examples that may serve as strong models moving forward, many questions remain: do digital badges have a sustainable future in museums? Is there a museum need and a visitor demand? Will badges work for some types of museums and not for others? David Theo Goldberg, director of the University of California Humanities Research Institute and former co-director of the MacArthur DML Competition suggests that badges that work do so only within “contexts that socially support them and where their users are invested in their significance.”⁵³ Can museums meet these requirements? While some museums are experimenting with digital badges, it is important to examine the related literature that more thoroughly presents how digital badges function in both theory and practice.

⁵³ David Theo Goldberg, “Badges for Learning: Threading the Needle between Skepticism and Evangelism,” *DML Central*, March 6, 2012, accessed February 2, 2015, <http://dmlcentral.net/blog/david-theo-goldberg/badges-learning-threading-needle-between-skepticism-and-evangelism>.

CHAPTER TWO: Review of the Literature

When applied to learning environments, some scholars, including Alexander Halavais, Associate Professor of Social Technologies at Arizona State University, insist that “A badge is a symbol that something exists, and it is important to make sure that it does not come to replace the thing it represents.”⁵⁴ But what is the “thing?” that a badge represents? As the aforementioned examples demonstrate, the literature suggests that not all badges carry the same meaning or intention. While the research is ongoing and some sub-categories and hybrid forms have been identified, June Ahn, Anthony Pellicon and Brian S. Butler, researchers from the College of Information Studies at The University of Maryland, College Park identify three primary ways that digital badges function: badges as a motivator for behavior, badges as a pedagogical tool, and badges as a signal or credential.⁵⁵ Already applied to other digital badge contexts, this taxonomy may also provide a useful framework to study badges within museums.

Most commonly, badges have been used as motivators of behavior. Often placed within the framework of gamification, these types of badges reflect the use of badges or stars in electronic games to indicate achievement, symbolize a status or level of player, and encourage deeper and ongoing engagement in the game.⁵⁶ The assumption is that once a player is “hooked,” he or she will continue to play, which in turn, increases the

⁵⁴Alexander M.C. Halavais, "A Genealogy of Badges," *Information, Communication & Society* 15, no. 3 (April 2012): 368.

⁵⁵ June Ahn, Anthony Pellicon, and Brian S. Butler, “Open badges for education: what are the implications at the intersection of open systems and badging?” *Research in Learning Technology*, vol. 22 (2014), doi: <http://dx.doi.org/10.3402/rlt.v22.23563>.

⁵⁶ Deterding, et al., 9-10.

“staying power” of a game.⁵⁷ The badge, in this instance, may be perceived as an extrinsic motivator, which much of the literature on digital badging finds to be problematic. Mitchel Resnick, Professor of Learning Research at the MIT Media Lab, for instance, is concerned that badge earners will “focus on accumulating badges rather than making connections with the ideas and material associated with the badges.”⁵⁸ Similar tendencies, Resnick asserts, occur in the academic classroom, where students may be more concerned with grades than the learning material, as well as in an educational game, where earning points, rather than the ideas in the game, are what generally motivate a player. “Simply engaging students is not enough,” Resnick argues, “they need to be engaged for the right reasons.”⁵⁹ The possible negative effects extrinsic motivators may have on intrinsic engagement, particularly in activities related to learning, remains a contentious issue.⁶⁰ That however, has not prevented employers, educators, and informal learning institutions from exploring badges that employ elements of gamification.

As a pedagogical tool, Ahn et al. assert that digital badges may help to “guide or scaffold learning through a process,” allow for free-choice learning that is commonly supported in informal learning environments, recognize specific learning behaviors, and

⁵⁷ Pat Galagan, “Playing Nice,” *TD: Talent Development* 68, no. 9 (2014): 24-26.

⁵⁸ Mitchel Resnick, “Still a Badge Skeptic,” HASTAC, February 27, 2012, accessed March 1, 2015, <http://www.hastac.org/blogs/mres/2012/02/27/still-badge-skeptic>.

⁵⁹ Ibid.

⁶⁰ Samuel Abramovich, Christian Schunn, and Ross Mitsuo Higashi, “Are badges useful in education?: it depends upon the type of badge and expertise of learner.” *Educational Technology Research and Development*, vol. 61, no 2, (2013): 217-232.

provide a pathway to understanding.⁶¹ If well-designed, these types of badges can signify knowledge and skills, serve as “guideposts” that assist learners in creating a learning path, and provide a way to track one’s progress along that path. This process does not occur in a vacuum, however, and requires significant oversight by a mentor, or knowledgeable evaluator. While some badge-issuing institutions may have the capacity to assist and assess a learner throughout the badge process, the financial and human resources this requires can be challenging.

Digital badges can also function as a signal or credential, which may supplement or provide an alternative to diplomas, standardized testing, and other traditional credentials.⁶² While these badges may serve to challenge or subvert formal learning contexts, many colleges and universities are experimenting with badges that reflect this model. Yet, much of the literature that this researcher has reviewed fails to address what purpose a badge serves within formal learning environments. For instance, if a badge is integrated into an academic course, does it not just become part of the traditional grading system? Does the badge carry value outside of the institution where it was earned? Furthermore, would a potential employer perceive a skill-based badge earned in an informal learning context as valid as a similar badge earned at a university? As Ahn et al. argue, “much of the rhetoric surrounding open badges⁶³ as a credentialing system

⁶¹ Ahn, et al, 4.

⁶² Mozilla Foundation and Peer 2 Peer University, in Collaboration with The MacArthur Foundation “Open Badges for Lifelong Learning” (2011), accessed January 7, 2015, https://wiki.mozilla.org/images/b/b1/OpenBadges-Working-Paper_092011.pdf.

⁶³ One example of the “rhetoric” Ahn, et al refers to is presented by Badge advocates, such as The Mozilla Foundation. On its Open Badges website, Mozilla distinguishes between digital badges and open badges in the following way: “A digital badge is an online representation of a skill you’ve earned. Open Badges take that concept one step

recognizes that a great deal of learning takes place in non-formal or informal contexts,” and that “individuals that are disenfranchised with traditional schooling, or face unequal access to higher education still learn a great deal in other settings.”⁶⁴ Other scholars, like Alexander Halavais argue that badges should not be used within formal learning contexts, and warns that “when badges are used as a way to certify knowledge and learning, the danger of monstrous hybridization becomes part of learning networks and educational institutions.”⁶⁵ Beyond the scope of this project, further research is required to better understand the impact that credentialing badges may play on the issuer, earner, and greater digital badge ecosystem.

While the supporting empirical research is limited, the literature suggests that different types of badges have varying impacts on its user’s motivation to learn and participate.⁶⁶ First, competency-based badges require one to complete specific tasks and demonstrate mastery over a content area in order to earn the badge. Cooper Hewitt’s *Design-Prep* program illustrates this model. Often considered to be intrinsically motivated process, earning competency-based badges provides internal rewards, such as

further, and allows you to verify your skills, interests and achievements through credible organizations. And because the system is based on an open standard, you can combine multiple badges from different issuers to tell the complete story of your achievements — both online and off. Display your badges wherever you want them on the web, and share them for employment, education or lifelong learning.” <http://openbadges.org/about/>. While the open badges model is relevant to some institutions, it is not universally applicable to badge initiatives within the museum context. As noted in the nomenclature section, this researcher defines a *digital badge* as an online record of an individual’s achievements, interests or participation. Unless otherwise denoted as an analogue badge, a digital badge is also referred to as a *badge*.

⁶⁴ Ahn, et al, 4.

⁶⁵ Alexander M.C. Halavais, "A Genealogy of Badges," *Information, Communication & Society* 15, no. 3 (April 2012): 369.

⁶⁶ Abramovich, et al.

intellectual and emotional growth, or personal satisfaction in mastering a new skill. This is not to suggest that external forces, such as a mentor, a certification, or a new professional opportunity cannot also be incentives, but the primary motivation resides within the badge earner and his or her desire to learn. Alternately, participatory badges are earned by engaging in an activity or contributing content, but in many cases, the simple act of participation can lead to the badge. While some earners may be motivated by the participatory process, others may contribute largely to earn the badge. Like the *DMA Friends* program exemplifies, participatory badges tend to incorporate elements of gamification that carry extrinsic rewards, such as discounts, unique experiences, and recognition. Admittedly, this is not a rigid dichotomy, as there are many factors that can impact one's motivation to earn, or not earn, a badge.

In their evaluation of students' change in learning motivations around both competency and participation badges offered through Carnegie Mellon University's CS2N intelligent tutoring system, researchers Samuel Abramovich, Christian Schunn, and Ross Mitsuo Higashi found that in addition to the type of badge, the prior knowledge and skill level of the learner can impact the earner's motivational relationship to the badge. Comparing higher and lower performing students, positive changes in motivation among higher performers could only be correlated with competency badges. In contrast, motivational changes among lower performing students were limited to participatory badges.⁶⁷ Overall, evaluators of the CS2N system found that digital badges could have both positive and negative effects on a learning motivation. Abramovich, et al. warns that "if badges are offered for learners who might not excel in the content area of the badges,

⁶⁷ Abramovich, et al., 228.

then there is the potential, depending on the design of the badges, for a negative motivational effect.”⁶⁸ In order to mitigate negative impacts, they proposed focusing on competency and limiting participatory badges.

This research, like much of the literature, was conducted within a formal educational context; thus its applicability to badges used within informal environments, such as museums, remains unclear. However, it raises a few ideas that may serve as best practices for future museum badging initiatives. First, badge issuers must consider the previous knowledge and experiences of their potential badge users. Issuers should also clearly articulate the goals and intended outcomes of their badge offerings to potential badge earners. Also, it is helpful for an earner to understand in advance the specific actions he or she must take in order to earn a badge. Furthermore, it is helpful for an earner to understand how the badge will be displayed, and if and how it may be validated outside of the context in which it was earned.

Beyond theoretical concerns about motivation, the literature identifies several other challenges that may impact the efficacy of digital badges. First, while badges may allow for new, diverse learning communities to emerge, Ahn et al. suggest that when a badge is earned in a small niche community or focuses on highly specialized skills, it may not be recognized as a credential by stakeholders outside of the community in which it was earned.⁶⁹ Granted, not all communities will desire or pursue outside recognition, but the current lack of standardization within credentialing badges creates barriers for those who may seek that type of validation. The literature suggests models for increasing

⁶⁸ Ibid., 230.

⁶⁹ Ahn, et al.

the likelihood of badge authentication across contexts, but further research is required.⁷⁰

Another concern relates to the fact that in some contexts, badge earners may be responsible for navigating their own pathways to learning and engagement. Without the guidance of a teacher or guide, a badge earner may be overwhelmed by “information complexity” and in turn, may struggle to scaffold, or build upon their understanding of new content in a meaningful way.⁷¹ An individual’s aptitude to recognize and pursue scaffolded learning through the use of digital badges can vary greatly.

Much of the opposition and skepticism about digital badges in the literature reviewed by this researcher alludes to the notion that because badges can be applied in a variety of ways and serve different functions, they will fail to be widely adopted or recognized across contexts. There are also concerns about consistency and quality control, seeing that anyone can issue a badge using the open badge framework. Furthermore, while credentials and notions of social and economic mobility are often linked, as Halavais asserts, it is unclear what socio-economic value a badge earned within an informal learning environment can realistically hold.⁷² For instance, can a badge earned within a museum maintain credibility beyond the institution in which it was issued? Recognizing both the challenges and possibilities of how badges that function as credentials might develop legitimacy, Ahn et al. propose some cogent questions:

Under what conditions would employers recognize a badge as reflecting desired skills, dispositions or social status? What processes, social interactions and cultural developments need to occur before badges are linked to economic and social returns? At what point do badges, which in

⁷⁰ Ahn, et al., Halavais, Elkordy.

⁷¹ Ahn, et al., 9.

⁷² Halavais, "A Genealogy of Badges."

their current use largely reflect informal learning experiences, become formalized and institutionalized? ⁷³

Still, as the badge strategies earlier introduced show, not all badge issuers are concerned with credentialing workforce skills or providing a greater social or economic utility for its badge earners. This review of the literature intimates that digital badges that are rooted in visitor engagement and data gathering seem to operate in a completely different paradigm, one where this line of questioning may be irrelevant.

Another perceived benefit of digital badges relates to its nature of openness, as increases in access to information are often associated with notions of transparency. ⁷⁴ Opening the channels of information may provide new opportunities for more individuals to be engaged and empowered to explore new ideas and skills. While controversial in higher education, one of the foundational goals of massively open online courses, or MOOCs, is to make content that is created by elite universities free and accessible to any learner, regardless of their educational or socio-cultural background. Not only can MOOCs provide access to courses that focus on traditional subjects, such as the sciences and humanities, but many MOOCs also transcend the paradigm of “academic” study, allowing a learner to explore and participate and even create smaller niche communities around virtually any subject, from digital photography, to travel, to video games. ⁷⁵ MOOCs, badges, and other systems of open appropriation may provide individuals the ability to create their own learning experiences, in effect, curating their own curriculum.

⁷³ Ahn, et al., 9.

⁷⁴ Ibid., 6.

⁷⁵ John.S. Brown and Richard P. Adler, “Open Education, The Long Tail and The Learning 2.0” *EDUCAUSE Review*, vol 43, no 1, 2008, 16-20.

Similarly, badges can be tailored to meet the needs and interests of a specific community of learners. The badge “issuer,” can develop badges to supplement other methods of engagement, or to experiment with completely new strategies, as many of the previously mentioned badge programs demonstrate. Cathy Davidson, Distinguished Professor and Director of The Futures Initiative at the Graduate Center, The City University of New York and co-founder of the open access community HASTAC suggests that an inquiry into badges can also provide an opportunity for an institution or community to reflect on its values and practices. Davidson asserts:

The activity of inventing a badging system means thinking through credentials and credit in a new way, that, in and of itself (even if one decides not to adopt such a system), affords us a rare opportunity, as a collective, to think together about what we think counts and how we count what everyone contributes to the learning experience.⁷⁶

Yet, one reason why informal learning environments are popular is because they provide an alternative to the rigid structures of formalized education. For instance, previous studies have shown that most people visit museums to learn something new and to socialize.⁷⁷ Seemingly, visitors are less concerned about making their museum visit “count” to external assessors, and more interested in a participatory experience that “counts” on their own terms. Henry Jenkins, Professor of Communication, Journalism,

⁷⁶ Cathy N. Davidson, “Institution, Know Thyself! How Members Can Decide What Counts dmlbadges.” *HASTAC*, October 9, 2011, accessed January 25, 2015, <http://www.hastac.org/blogs/cathy-davidson/2011/10/09/institution-know-thyself-how-members-can-decide-what-counts-dmlbadge#.TpGIDNoVQUE.twitter>.

⁷⁷ John H. Falk, *Identity and the Museum Visitor Experience*. Walnut Creek, CA: Left Coast Press, 2009.

and Cinematic Arts at the University of Southern California, questions if adding digital badges might impede the informal nature of these institutions:

If we move to see badges as a common currency of achievement in informal learning, then what happens to those activities, which chose, on principle, not to give badges or which lack the formal infrastructure to even decide who should be issuing badges? Do these activities, in fact, become even more marginalized, because they are now neither part of the formal system of schooling or part of the informal system of badging? This is another way that badges potentially disrupts what's working about participatory culture.⁷⁸

In her review of the digital badge landscape, Assistant Professor of Learning Sciences at National Louis University, Angela Elkordy acknowledges the many salient concerns regarding the use of badges within learning contexts. She notes that “Ironically, the process of responding to badge criticism mirrors the process of how badges can possibly function as formative assessment, in that the badge ecology can be strengthened in the process through both positive and negative feedback.”⁷⁹ Because the greater digital badge ecosystem is still in its infancy and the long-term utility of badges within museums remains uncertain, this thesis may resemble a similar process. By gathering and synthesizing feedback from the museum community, this researcher intends to highlight best practices, identify challenges, and propose useful strategies for further digital badge research and experimentation within the field.

⁷⁸ Henry Jenkins, “How to Earn Your Skeptic “Badge” March 5, 2012, *HenryJenkins.org*, accessed March 1, 2015.
http://henryjenkins.org/2012/03/how_to_earn_your_skeptic_badge.html.

⁷⁹ Angela Elkordy, “The future is now: Unpacking digital badging and micro-credentialing for K-20 educators, HASTAC, October 24, 2012, accessed January 25, 2015, <http://www.hastac.org/blogs/elkorda/2012/10/24/future-now-unpacking-digital-badging-and-micro-credentialing-k-20-educators>.

CHAPTER THREE: Methodology

While some well-known museums that are currently using digital badges have documented their experiences, little information exists regarding how the majority of the museum community perceives them. In the hopes of gathering useful qualitative and quantitative data related to this topic, this researcher employed a multi-method approach. First, she conducted a front-end study of museum professionals to determine their familiarity and experience with the concept of digital badges in the museum context. This was administered through an online survey via surveyshare.com.

Through multiple choice, scalar, and open-ended questions, museum professionals were asked to share their experience (or lack thereof) with digital badges, if and how they foresee using badges in the future, and the perceived challenges and strengths of badges as a tool for learning and/or engagement. Survey respondents were also asked to provide demographic information, such as the type and size of their institution. An optional question requested each respondent's contact information to enable this researcher to follow up for clarification or elaboration.

The online instrument was distributed to museum-related listservs, professional associations and emailed directly to museum professionals who had expressed an interest in participating. This message included a brief introduction to this thesis project and the contributions that the findings may have for the museum field, followed by an invitation to participate in the online survey, and a direct link to the instrument.

The researcher solicited participation in the online survey by posting on online listservs and discussion groups, including MuseumEd.com, Museum Computer Network,

ArtTeaching.com, ASTC, Philly Emerging Museum Professionals, Philadelphia Museum Council, and The American Alliance of Museums (Museum Junction Open Forum). The online survey was also promoted through the researcher's personal Twitter account and was re-tweeted upon email request by Elizabeth Merritt, Director of The Center for the Future of Museums and Carla Casilli, former Director of Design and Practice at the Badge Alliance. It was also re-tweeted by other museum and education-related Twitter users without solicitation.

A bitlink of the survey was established to post on Twitter. This bitlink indicates that it was clicked on twelve times and saved once. It was also retweeted five times and favorited 4 times. Twitter was not a significant method of collecting responses, but may have helped to reach a few additional participants. The instrument was posted on Twitter four times between June 4 and June 23, 2015. (June 4, June 10, June 19, June 23). The Tweets were accompanied by hashtags related to the topic, including #openbadges, #EduTues and included mentions of the Twitter handles of related organizations, @BadgeAlliance, @Museweb and @CitiesLearn. This researcher also saw an increase in museum and tech-related followers during this period.

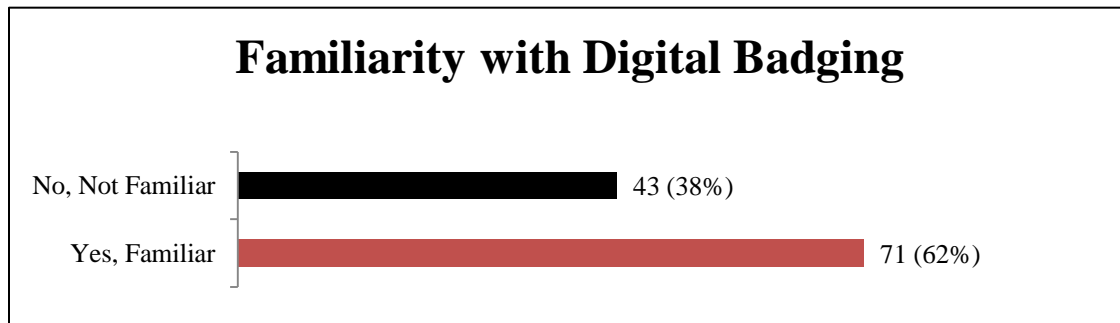
In addition to the online instrument, this researcher conducted a series of interviews with museum staff who have experience implementing digital badges within their institution, as well as museum staff, who after careful consideration, decided not to implement a badge system. While each interview reflects the unique experiences and perceptions of badges by a single person, when presented as case studies, they illustrate some of the themes that emerge from the data collected through the online survey and highlight common perceptions and best practices related to digital badges in museums.

CHAPTER FOUR: Presentation of Survey Findings

Survey Design

The purpose of this survey was to collect useful data about the current practices and perceptions about digital badges in the museum field. As such, the instrument was designed to confirm, recognize, and filter respondents into categories for analysis. First, the opening survey question was intended to identify respondents who were not familiar with digital badges, and thus would be unable to adequately complete the survey.

Figure 1 Are you familiar with the concept of digital badges within the museum context?
n=114

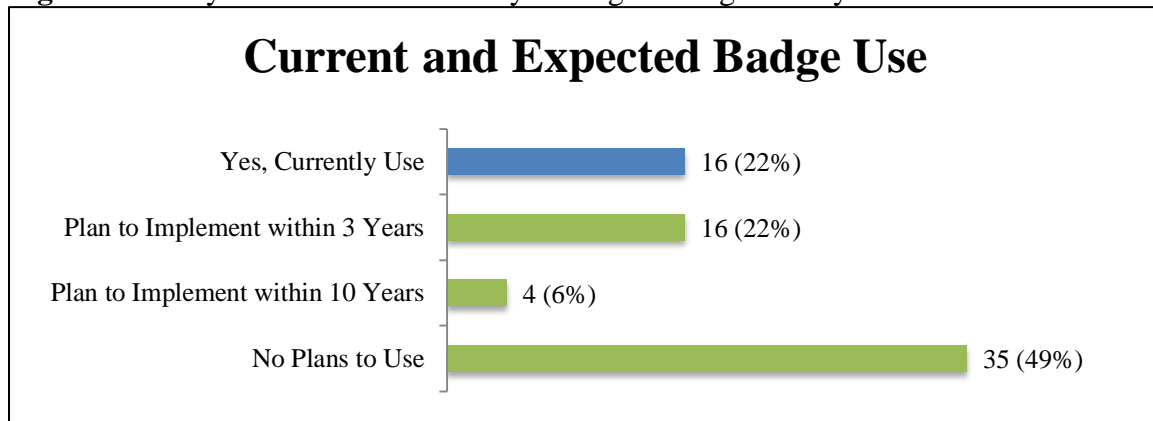


The survey's opening question, "Are you familiar with the concept of digital badges in the museum context?" elicited responses from 114 museum professionals. While all "No" responses were documented, this selection automatically directed a respondent to a final "Thank You" page. No additional data was gathered about the "No" respondents, although this researcher recommends that future research could be designed to capture more information about this population. For the purposes of this study, the fact that 43, or 38% of respondents indicate that they are not familiar with the concept of digital badges offers some useful insight.

Presuming that this sample is relatively representative of the greater museum field, these results support this researcher's assertion that digital badges are a new and somewhat foreign concept to many museum professionals. As discussed in Chapter Three, participation was targeted to online communities that were more likely to have some knowledge of digital badges and 71, or 62% of respondents indicate that they are familiar with the concept. This group of 71 museum professionals familiar with digital badges is the sample that will be explored throughout this chapter.

Additionally, this sample is further divided into two subgroups: Current Issuers and Potential Issuers. The question, "Does your institution currently use digital badges in any form?" was intended to establish these subgroups, as well as to gather data about Potential Issuers expectations for the future.

Figure 2 Does your institution currently use digital badges in any form? n=71



While some comparisons will be explored between the respondents who "Plan to Implement within 3 Years," "Plan to Implement Within 10 years," and those who have "No Plans to Use," unless it is denoted otherwise, this researcher considers all three subgroups to be "Potential Issuers." This delineation is based on multiple lines of reasoning. First, all respondents who selected "No Plans to Use" completed the full

survey; no one discontinued the survey after providing this response. Also, all responses reflect the perceptions of individual museum professionals, and may not reflect the official stance of the institution they represent. Next, the motive behind one's selection is not clear. It would be erroneous to assume that all "No Plans to Use" responses reflect that a museum opposes badge implementation for specific reasons, as it is possible that an institution has not yet considered the use of badging. Additionally, these responses reflect theoretical or anticipated plans. It is conceivable that institutions with no current plans may still develop a badge program in the future. Similarly, it remains uncertain if respondents who "Plan to Implement" badges in the future will actually do so.

Demographic Summary

Table 1 What type of museum do you work for? Current Issuers n=16, Potential Issuers n=55, Total n=71

Museum Type	Current Issuers	Potential Issuers	Total Sample
Art	6 (37%)	16 (29%)	22 (31%)
Science and/or Technology	5 (31%)	11 (20%)	16 (23%)
History	3 (19%)	10 (18%)	13 (18%)
Historic House/Historic site	0 (0%)	9 (16%)	9 (13%)
Natural History/Anthropology	0 (0%)	5 (9%)	5 (7%)
Zoo/Aquarium	2 (12%)	0 (0%)	2 (3%)
Children's or Youth	0 (0%)	1 (2%)	1 (1%)
Garden/Arboretum	0 (0%)	1 (2%)	1 (1%)
Other	0 (0%)	2 (4%)	2 (3%)
Total Respondents	16	55	71

Survey respondents most frequently represent Art Museums (31%), Science and/or Technology museums (22%), and History Museums (18%). As Table 1 shows, these are the most commonly indicated types within both Current Issuer and Potential

Issuer subgroups. “Other” respondents include an Independent Museum Consultant and an Instructional Design Project Manager at a state university.

Each year, The American Alliance of Museums (AAM) publishes a statistical report on accredited museums. Of the 779 museums who participated in AAM’s 2014 report, Art Museum/Center represented 41% of respondents. History Museums accounted for 22% of respondents and were the second most commonly listed type. Science and Technology Museums signified only 3% of reporters (See Tables 9 and 10 on page 160).⁸⁰ The respondents of this researcher’s survey seem to represent a similar demographic breakdown, with one exception: Science and/or Technology museums constitute a considerable percentage of this survey’s participants. Based on its area of focus, these institutions may be more likely to use or explore technology, and thus have an interest in participating in a survey about digital badging. Additionally, as mentioned in Chapter Three, the survey was distributed to professional groups affiliated with museums of science and technology.

⁸⁰ “Accreditation Statistics,” *American Alliance of Museums*, January 2014, accessed September 30, 2015, <http://www.aam-us.org/resources/assessment-programs/accreditation/statistics>.

Table 2 What is your position title? Current Issuers n=16, Potential Issuers n=55, Total Sample n=71

Position Title	Current Issuers	Potential Issuers	Total Sample
Director of Digital Technology	1 (6%)	1 (2%)	2 (3%)
Exhibit Designer/Developer	1 (6%)	2 (4%)	3 (5%)
Project Manager	1 (6%)	2 (4%)	3 (5%)
Visitor Services	0 (0%)	3 (5%)	3 (5%)
Marketing and Communications	0 (0%)	5 (9%)	5 (8%)
Museum Director	0 (0%)	6 (11%)	6 (9%)
Educator	13 (81%)	30 (55%)	43 (66%)
Total Respondents	16	55	71

When provided with an opportunity to include their position title, 43 (66%) of the total sample identify as Museum Educators. Among Educators, 7 (11%) have the term “Digital” included within their position title. Examples include “Coordinator of Digital Learning” and “Associate Manager of Digital Media and Online Learning.” Comparing subgroups in Table 2, Potential Issuers represent a slightly broader range of professional roles, whereas all but three Current Issuers are described as Museum Educators.

Table 3 What is your institution's annual budget? Current Issuers n=16, Potential Issuers n=55 Total Sample n=71

Annual Budget	Current Issuers	Potential Issuers	Total Sample
\$50 million or more	0 (0%)	3 (5%)	3 (4%)
\$25 million to \$49.9 million	2 (13%)	3 (5%)	5 (7%)
\$10 million to \$24.9 million	5 (31%)	5 (9%)	10 (14%)
\$5 million to \$9.9 million	2 (13%)	5 (9%)	7 (10%)
\$2.5 million to \$4.9 million	1 (6%)	8 (15%)	9 (13%)
\$1 million to \$2.49 million	2 (13%)	10 (18%)	12 (17%)
\$500,000 to \$999,999	0 (0%)	6 (11%)	6 (8%)
\$250,000 to \$499,999	1 (6%)	6 (11%)	7 (10%)
Less than \$250,000	0 (0%)	2 (4%)	2 (3%)
Don't know	3 (19%)	7 (13%)	10 (14%)
Total Respondents	16	55	71

The reported annual budgets suggest that respondents represent a range of institutional sizes. The most frequently reported budget among the total sample is \$1 million to \$2.49 million. This is also indicative of the Potential Issuer subgroup. However, the most recurring budget category reported by Current Issuers, is larger by comparison; \$10 million to \$24.9 million. Seemingly, this implies that financially larger institutions may be more likely to be early adopters of digital badges.

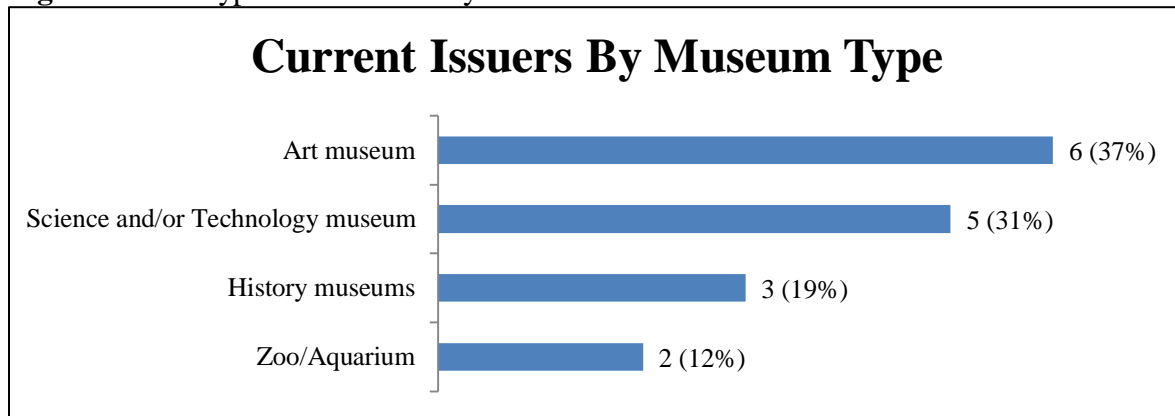
Table 4 Approximately how many on-site visitors did you have last year? Current Issuers=16, Potential Issuers=53 Total=69

Annual Visitors	Current Issuers	Potential Issuers	Total Sample
More than 1 million	2 (13%)	6 (11%)	8 (12%)
500,001-999,999	6 (38%)	4 (8%)	10 (14%)
250,001-500,000	2 (13%)	3 (6%)	5 (7%)
100,001-250,000	3 (19%)	14 (26%)	17 (25%)
50,001-100,000	2 (13%)	7 (13%)	9 (13%)
25,000-50,000	1 (6%)	10 (19%)	11 (16%)
Less than 25,000	0 (0%)	9 (17%)	9 (13%)
Total Respondents	16	53	69

The total survey sample represents a wide range of visitation rates, most of which are moderately distributed among each numerical category. There are, however some differences between current and potential issuers. Half of Current Issuers report having at least 500,001 annual on-site visitors, whereas this rate applies to only 19% of Potential Issuers. Potential Issuers most frequently indicate that their institution welcomes between 100,001-250,000 visitors per year, a range that also reflects the most common response of the total sample. Again, these results suggest that larger institutions may be early adopters of digital badges.

Current Issuers: Digital Badge Strategy in Practice

Figure 3 What type of museum do you work for? n=16

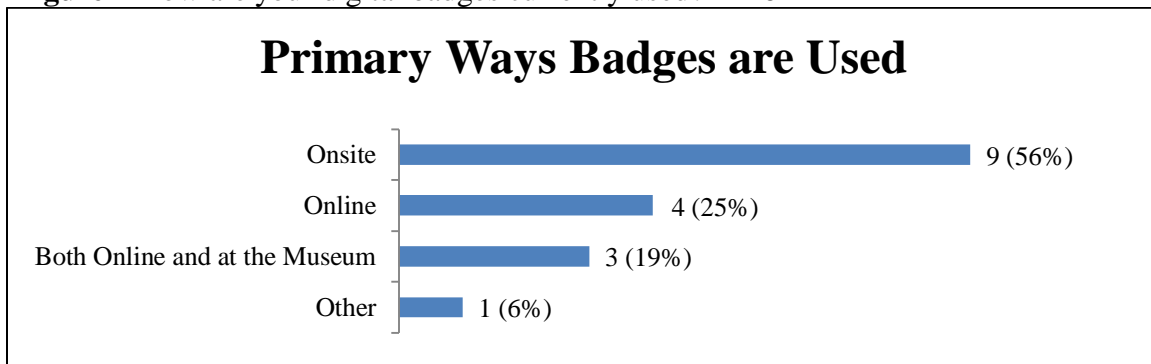


As depicted in Figure 3, Current Issuers represent four types of institutions.

According to statistics published by the American Alliance of Museums (AAM), these types denote some of the most and least populated museum categories (see Table 9 in Appendix B on page 160). Art and History Museums represent 63% of accredited institutions that participated in AAM's report, while Zoos, Aquariums, and Science/Technology museums signify a combined 5% of AAM's respondents.⁸¹ Several museum types are not represented within the Current Issuer subgroup, including Historic House/Historic Site, Garden/Arboretum, Natural History/Anthropology, and Children's/Youth Museum.

⁸¹ "Accreditation Statistics," *American Alliance of Museums*, January 2014, accessed September 30, 2015, <http://www.aam-us.org/resources/assessment-programs/accreditation/statistics>.

Figure 4 How are your digital badges currently used? n=16

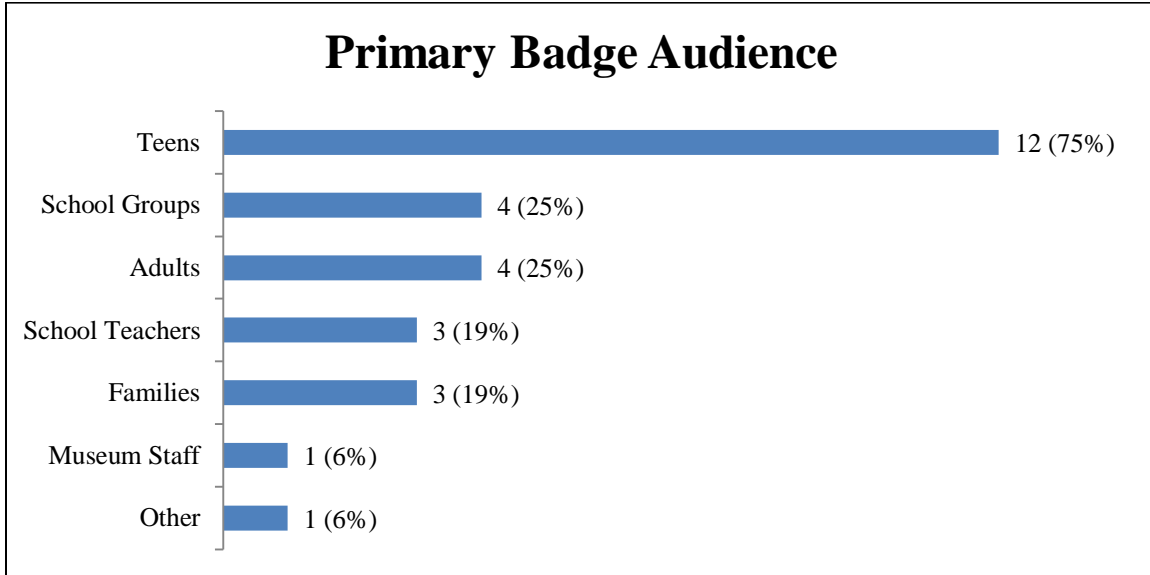


Current Issuers most frequently suggest that their digital badges are used onsite, during a museum visit. Some museums provide computer stations, iPad kiosks, or offer access to a mobile device that is necessary to participate. Other onsite programs may require an earner to access the digital content through a web browser or app on their mobile phones. A comment added by one respondent implies that not all onsite badges must involve a traditional museum visit, for they may also be issued for special events.

Used to reward field event participation.

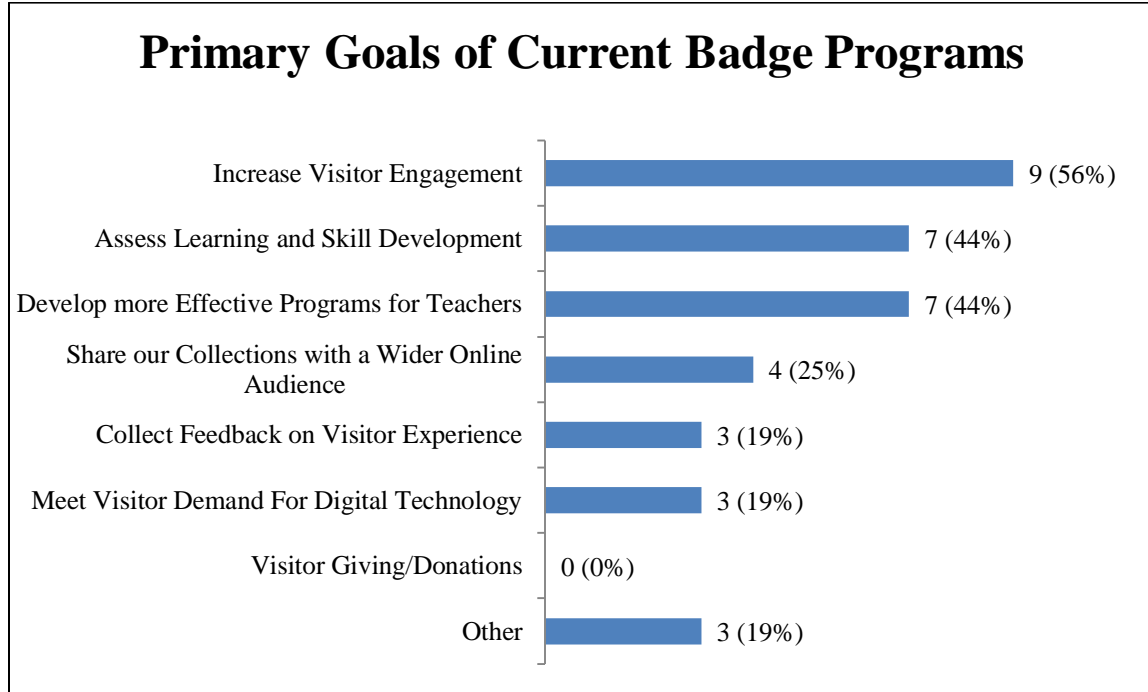
-Exhibit Developer at a Science/Technology Museum

Figure 5 Who is the primary audience for your badge offerings? Select all that apply.
n=16



A majority (75%) of Current Issuers indicate that teens are a primary audience, which may relate to the tendency for teenagers to be active users and consumers of technology. While half of respondents selected more than one audience, the other 50% noted only one, which may allude to two models of badge design: badges for a broader audience, and badges intended for a specific group. These findings suggest that museums may have found ways to engage teens in both teen-focused badging programs, as well as initiatives that engage a wider museum audience.

Figure 6 What are the primary goals of your digital badge program? Select all that apply.
n=16



Current Issuers most frequently indicate that the primary goal of their digital badge program is to increase visitor engagement. Assessing learning and skill development and developing more effective programs for teachers are also recurrent goals among this group. In contrast, Issuers do not identify visitor giving as a primary aim. There appears to be a strong emphasis on engaging and serving audiences, however as the “Other” responses exemplify, each badge program may have its own unique objectives:

Offer recommendations based on a user's personal interests.

- Digital Engagement Programs Assistant at an Art Museum

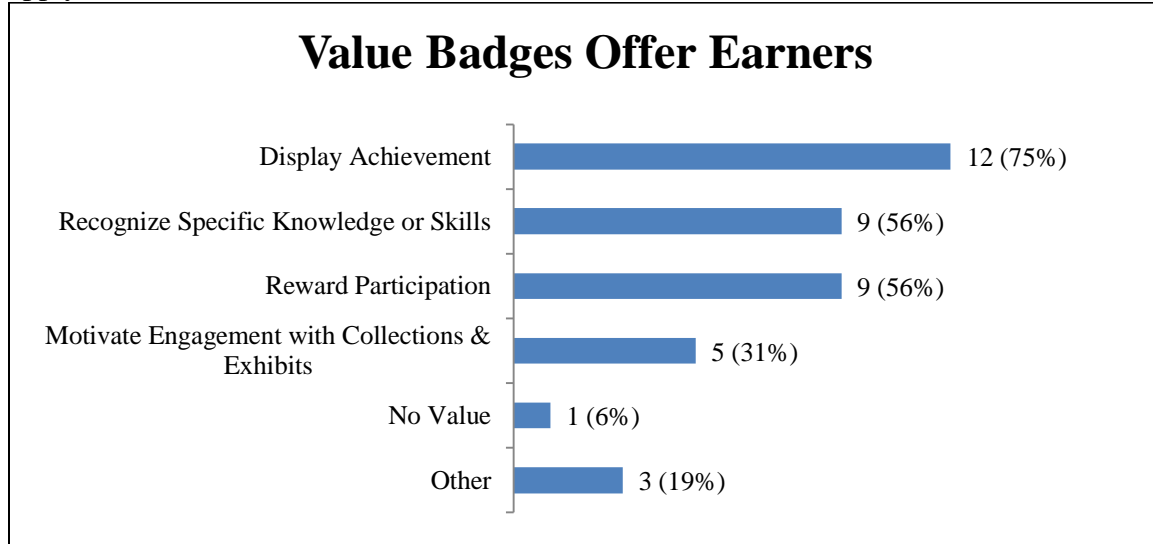
Provide a better understanding of the learning happening for our student participants, almost like a digital resume.

-Director of a Teen initiative at an Art Museum

To be part of the local City of Learning digital badge emphasis.

- Education Programs Coordinator at a History Museum

Figure 7 What intended value do digital badges offer your audiences? Select all that apply. n=16



Current Issuers most frequently indicate that their digital badges offer value to earners because they provide a way to display achievement. Benefits related to learning and engagement are also commonly noted among respondents. “Other” responses provide examples of how a digital badge program may offer tangible benefits:

Teachers can receive Clock Hours or Graduate Credit for badging program completion.
-Coordinator of Digital Learning at a Zoo/Aquarium

Provides [sic] different vehicle for telling stories, getting students excited about history through a media that appeals to them.
-Digital Initiatives Coordinator at a History Museum

The survey presented Current Issuers with additional questions regarding badge earner feedback. Nearly half of Current Issuers indicate that they have surveyed their badge earner audience. The descriptions of the responses received from badge earners allude to three common themes: satisfaction with the program, confusion about the purpose or value, and a lack of familiarity with the concept of badges. These themes are

not mutually exclusive, as most responses address more than one theme. Sample responses include:

We surveyed visitors on our loyalty rewards program, which includes digital badging. They expressed satisfaction overall with the program, but expressed some confusion concerning earning points and badges.

-Education Coordinator at an Art Museum

Pretty neutral. The teens are very oriented towards doing things that help them graduate or get to college and the idea of badges appeals to them for the portfolio aspect, but no organizations are really recognizing them, so at the end of the program the teens tend to not get the point.

-Manager, STEM Teen Community at a Science Museum

Mostly positive. Equally ambiguous. Younger (late middle school) are more excited about badges than teens.

-Digital Manager at a History Museum

We conducted a professional development survey on teachers a few years ago, before we developed any badging program, and had 412 responses. "Are you familiar with or have you participated in badging?" 379 responded with 'No,' 29 responded with 'Familiar,' 7 had Participated in a program.

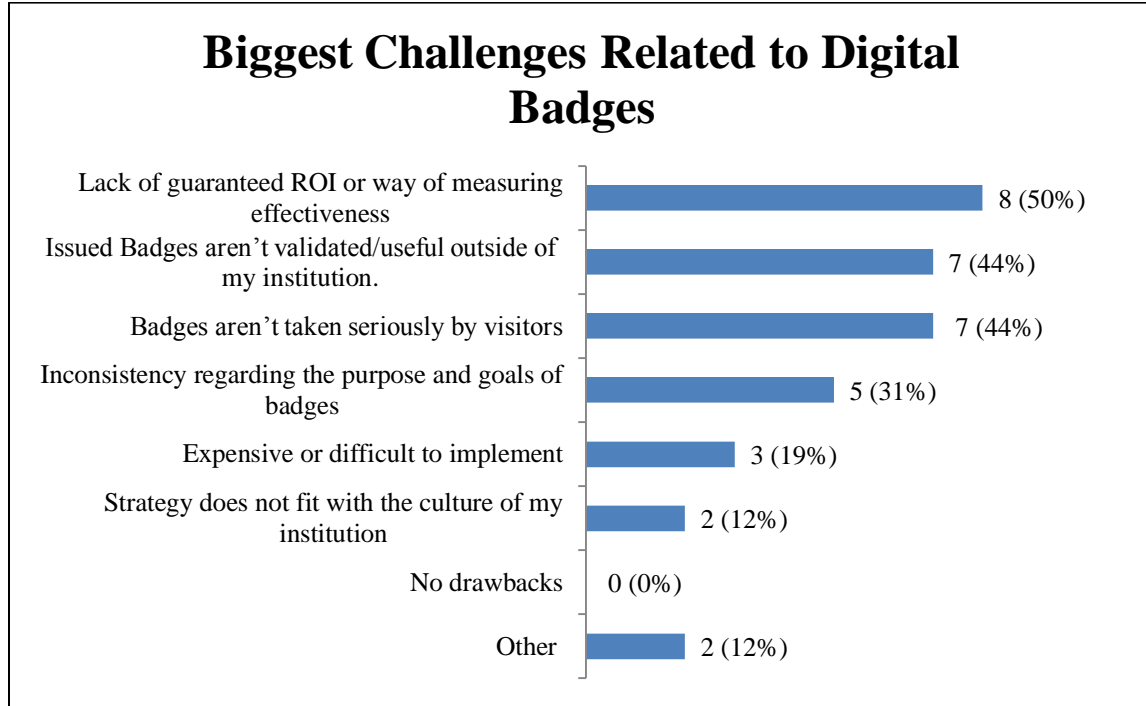
-Coordinator of Digital Learning at a Zoo/Aquarium

While no responses included specific instances of negative badge earner feedback, the majority of the comments allude to both enthusiasm and ambivalence about the badging experience. Not unlike the professional museum community, museum audiences also seem to have varying levels of experience with, and perceptions of digital badges.

Current Issuers: Assessment and Perceptions

In addition to relaying information about their specific digital badge programs, Current Issuers were also invited to consider the challenges and strengths of digital badges more generally.

Figure 8 What are the biggest challenges related to digital badges? Select all that apply.
n=16

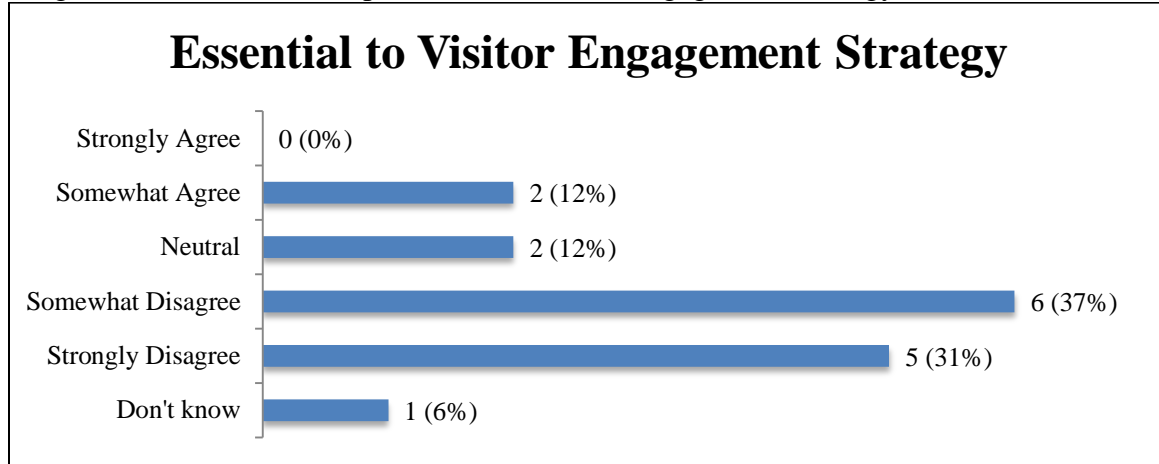


Current Issuers most often suggest that the biggest challenge related to digital badging is a “lack of guaranteed return on investment or way of measuring effectiveness.” Challenges regarding a badge’s value as perceived by earners and validated by outside parties are also commonly conveyed. As Figure 8 denotes, some Current Issuers express concern about a return on investment, however interestingly, most do not identify the financial investment required for implementation as a major challenge. An “Other” response reflects an underlying issue within the optional responses; a general lack of awareness about digital badges:

People don't widely know about them yet.
-Director of Education at an Art Museum

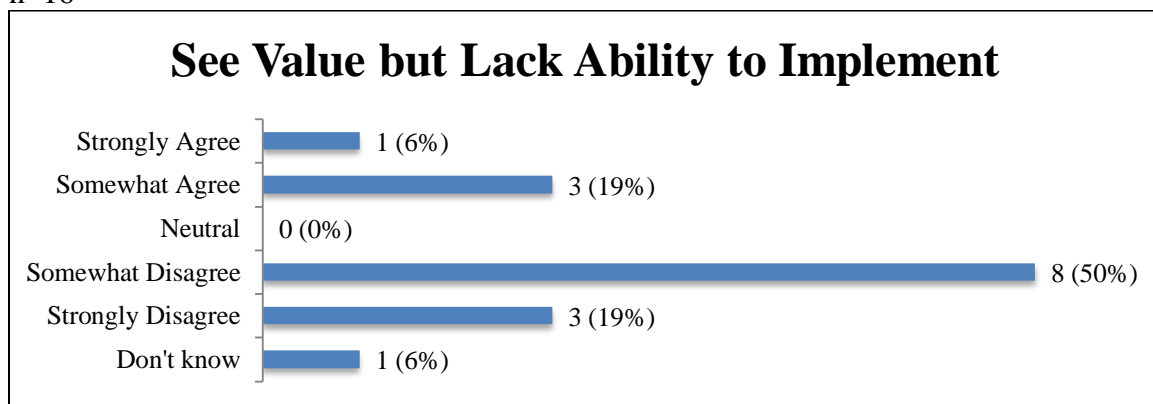
Next, a number of scalar questions aimed to further examine Current Issuer’s perceptions about the role and of digital badges within their institution.

Figure 9 To what extent do you agree or disagree with the following statement: Digital badges are an essential component to our visitor engagement strategy? n=16



As illustrated in Figure 9, responses indicate some contrasting views on the role digital badges play in Current Issuer's engagement strategies. However, as discussed in previous chapters, institutions utilize badges in a variety of ways. Respondents who express disagreement may be using badges for other purposes (Figure 6 on page 44) as well as for other audiences besides general museum visitors (Figure 5 on page 43).

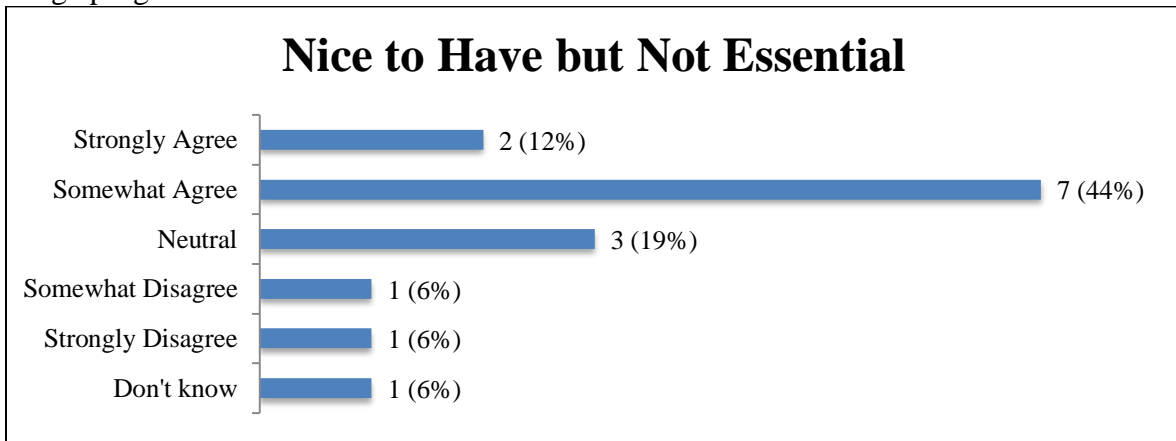
Figure 10 To what extent do you agree or disagree with the following statement: Our organization sees the value of digital badges, but lacks the ability to implement them? n=16



There appears to be some disagreement among Current Issuers regarding their perceived ability to implement a digital badge program. It is interesting that 25% of

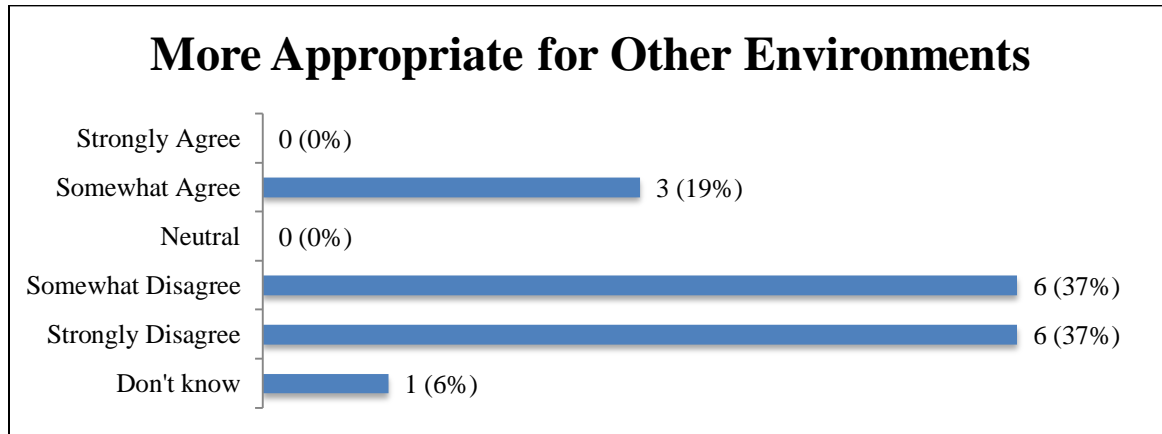
Current Issuers at least somewhat agree with the statement presented in Figure 10, seeing as their program is already in place.

Figure 11 To what extent do you agree or disagree with the following statement: Digital badge programs are nice to have but are not essential? n=15



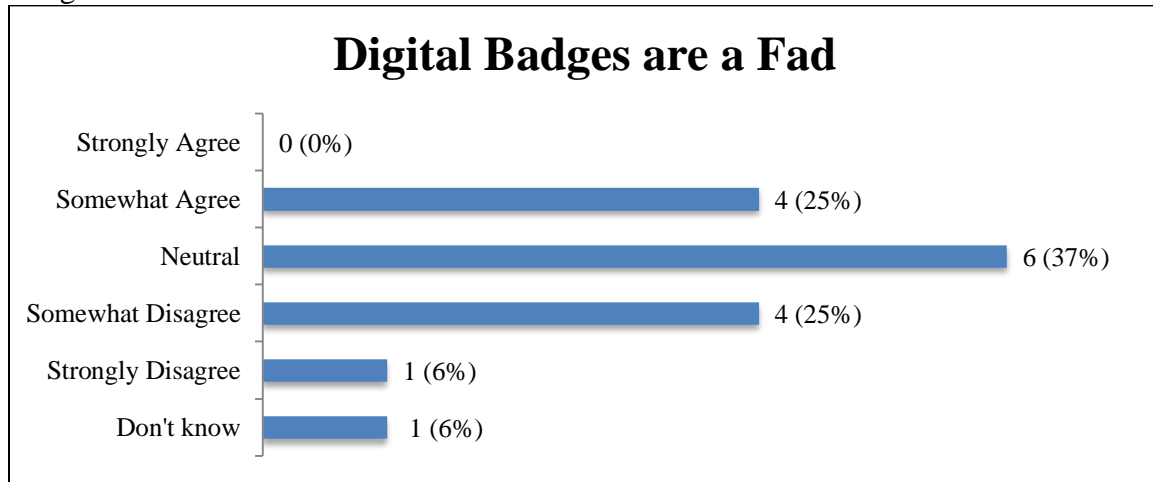
The question presented within Figure 11 was posed to better understand Current Issuer's perceptions about the level of significance badges play within their institutions. Over half of respondents at least somewhat agree that while badges programs provide some value, they are not essential.

Figure 12 To what extent do you agree or disagree with the following statement: Digital Badges are more appropriate for commercial or formal educational environments than museums? n=16



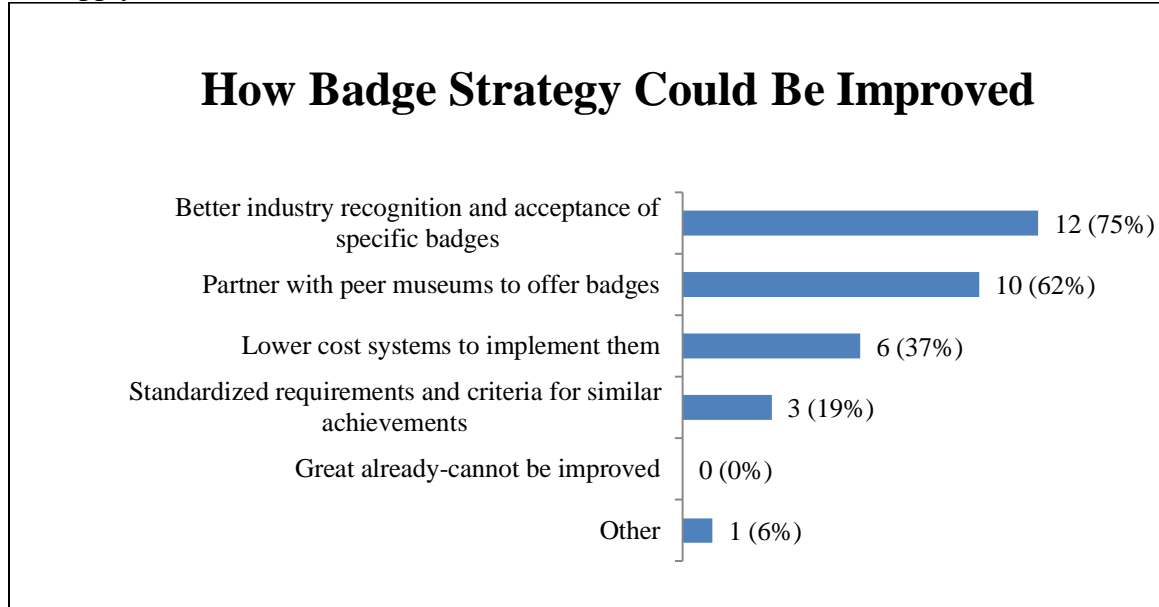
As discussed in Chapter One, digital badges are being applied in a variety of environments, including institutions of higher education, corporations, and online communities. Some of these settings precede the use of badges in museums. Most Current Issuers however, seem to believe that the museum is an appropriate context for digital badge implementation.

Figure 13 To what extent do you agree or disagree with the following statement: Digital Badges are a fad? n=16



The question presented in Figure 13 was inspired by a critique of digital badges presented within the related literature, and identified through informal discussions conducted by this researcher. It intends to better understand the perceived long-term viability of digital badges among Current Issuers. These results may suggest that there are some differing views about the growing trend of badges, even among museums currently issuing them. Issuers most often express neutrality and more disagree than agree with the statement.

Figure 14 How could the strategy of digital badges in museums be improved? Select all that apply. n=16



Current Issuers indicate a measurable interest in improving the way specific badges are recognized and accepted within the museum field. This suggested change seemingly aligns with the second most common response, related to partnering with peer museums to offer badges. In fact, the success of the latter may facilitate the realization of the former. Offering a criticism of a specific program, one current user’s “Other” response suggests that badge programs need to be more “intuitive:”

The city-wide program for youth is wonderful - in theory. In practice it is clunky and not intuitive.

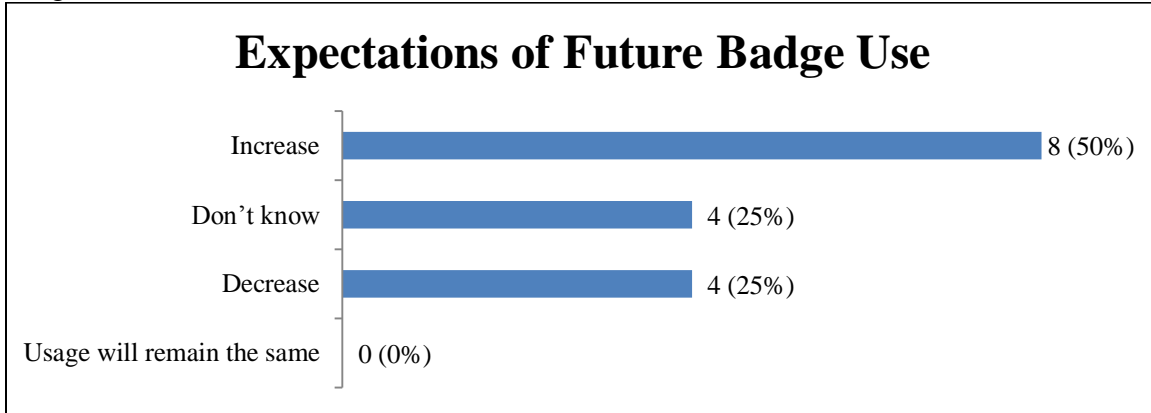
-Education Programs Coordinator at a History Museum

Table 5 How would you rate the following possible challenges to implementing digital badges in your museum? n=16

Possible Challenges to Implementation	Very	Somewhat	Neutral	Not Very	Not At All	Don't Know
Creating and Maintaining Content	5 (31%)	7 (44%)	1 (6%)	2 (13%)	0 (0%)	1 (6%)
Visitor Demand	5 (31%)	3 (19%)	2 (13%)	2 (13%)	2 (13%)	2 (13%)
Assessing a Badge Earner's Learning	4 (25%)	4 (25%)	1 (6%)	3 (19%)	2 (13%)	2 (13%)
Internal Funding	4 (25%)	3 (19%)	4 (25%)	2 (13%)	0 (0%)	1 (6%)
External Funding	2 (13%)	5 (31%)	3 (19%)	3 (19%)	0 (0%)	3 (19%)
Inconsistency Regarding the Purpose of Badges	2 (13%)	5 (31%)	3 (19%)	3 (19%)	1 (6%)	2 (13%)
Ability to Measure Effectiveness	2 (13%)	5 (31%)	1 (6%)	2 (13%)	4 (25%)	2 (13%)

Respondents were asked to rate several possible challenges related to implementing digital badges in their museum on a scale of “Very Challenging” to “Not at all Challenging.” The issues most often identified as most challenging among Current Issuers are creating and maintaining content (31%) and visitor demand (31%). The ability to assess a badge earner’s learning (25%) and internal funding (25%) are also frequently selected as significant challenges. There is some disagreement among Current Issuers regarding the difficulty in measuring effectiveness. Nearly half of issuers find this to be at least somewhat challenging, while 25% indicated that this presents no challenge. Internal and external funding seem to present some challenges, although internal funding is more often acknowledged as “Very Challenging” (25% of Current Issuers).

Figure 15 Do you expect that museums will increase or decrease their use of digital badges in the future? n=16

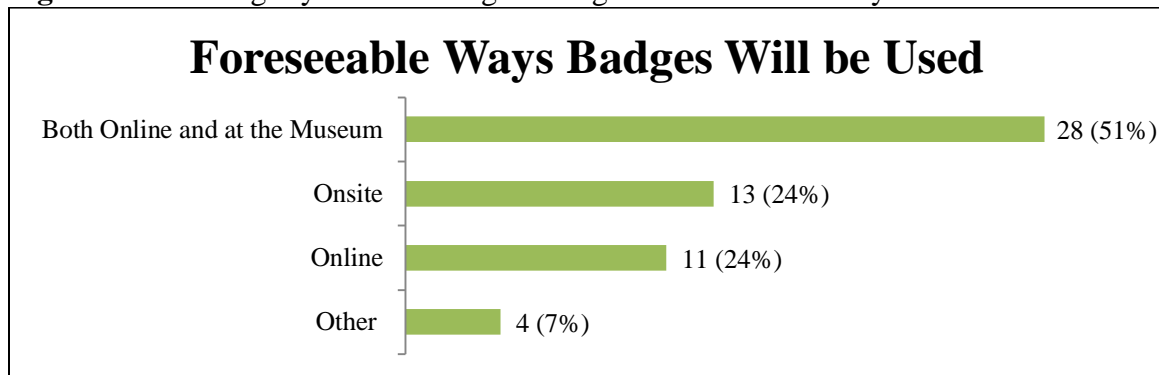


While they disagree on whether it will grow or decline, Current Issuers agree that the digital badge ecosystem is in a state of flux. The majority (75%) of this group expects that the use of digital badges in museums will change in the future, and half of respondents indicate that they anticipate an increase in badge use. Others express uncertainty about what the future holds, but no Current Issuers suggest that badge usage will continue at its current level.

Potential Issuers: Foreseeable Badge Plans

In addition to capturing information about current digital badge practices, a series of questions were directed at Potential Issuers to better understand their theoretical plans for the future.

Figure 16 How might you foresee digital badges to be used within your institution? n=55



Potential Issuers most often respond that their badge programs will be used both online and at the museum. This differs somewhat from Current Issuers, who more often indicate that their badging programs take place primarily onsite (see Figure 4 on page 42). Perhaps this is suggestive of a future trend, where more museums will create models that blend both online and in-person participation.

“Other” responses describe some specific uses, audiences, and locations for utilization, such as community sites and schools:

For educational programs, which we host both onsite and elsewhere in the city.

-Program & Communications Manager at a Science and Technology Museum

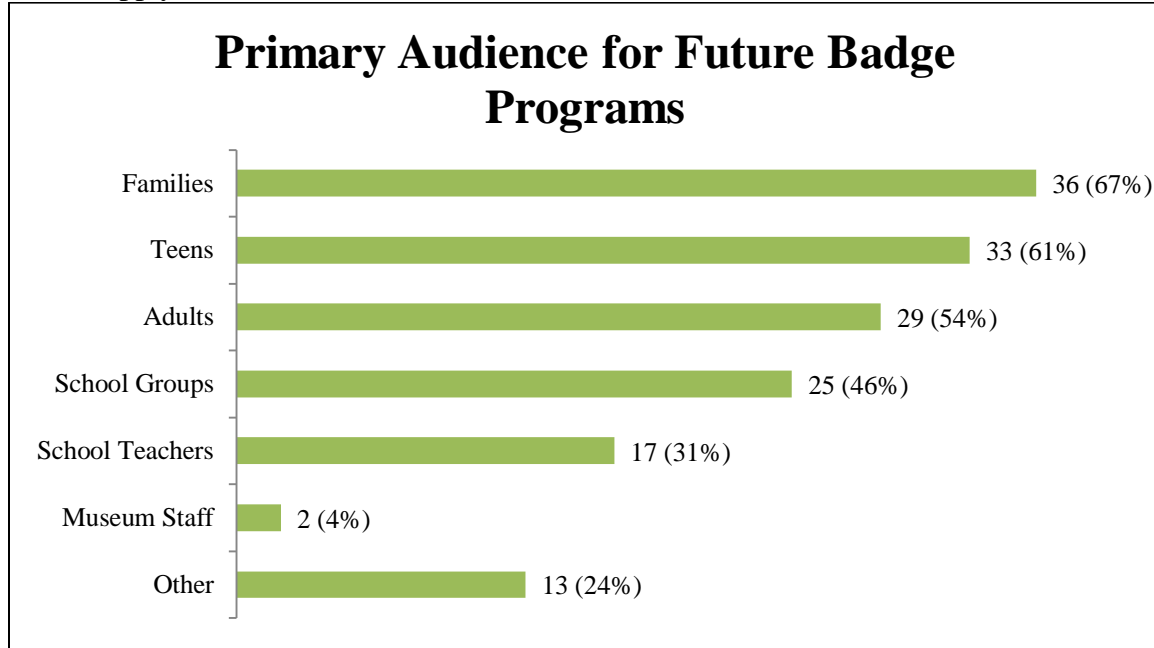
Pre and Post-visit activities, history club for kids.

-Community Engagement Coordinator at a History Museum

Make practicum/internship experiences more structured and granular.

-Director of a Natural History/Anthropology Museum

Figure 17 If you were to offer badges, who would likely be the primary audience? Select all that apply. n=54



Potential Issuers most frequently indicate that the primary audience for their future badge programs may be families, followed by teens, and adults. Similar to Current Issuers, 48% of Potential Issuers selected more than one audience. This may be partially attributed to the fact that Potential Issuers have not decided on their primary audience. However, it may also suggest that while Potential Issuers may eventually offer badges to a specialized audience, others may be interested in engaging a wider group of participants. “Volunteers” are denoted as a primary audience within 23% of “Other” responses. Additional “Other” examples include:

Scouts -Deputy Director at a Science and Technology Museum

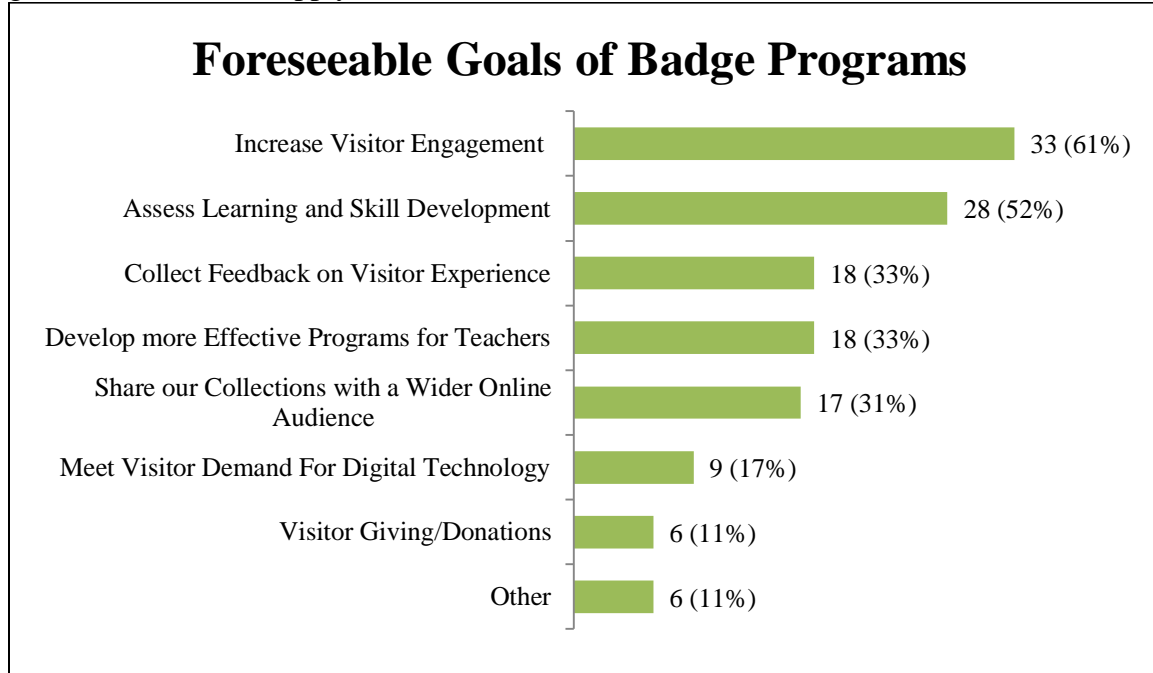
Volunteers -Programming and Exhibit Developer at a Science Museum

Community Groups -Curator of Education at a History Museum

Interns/practicum students -Director of an Anthropology Museum

Homeschoolers -Head of School Programs/Teacher Resources at an Art Museum

Figure 18 If you were to develop a digital badge program, what might be its primary goals? Select all that apply. n=54



Like Current Issuers, Potential Issuers identify a variety of objectives that digital badges may meet, but most often express an interest in goals aligned with visitor engagement and learning. While 11% of Potential Issuers indicate that visitor giving might be a foreseeable aim, no Current Issuers identified this as a value (see Figure 6 on page 44). Although some of the “Other” responses seemingly coincide with one or more of the goals listed above, perhaps participants felt their primary goal was not listed, or wished to add clarity. Examples include:

Stay relevant in a changing educational landscape.

-Head of School Programs and Teacher Resources at an Art Museum

Greater visitor continuity/personalized experience

-Patron Experience/Exhibit Designer at Science/Tech

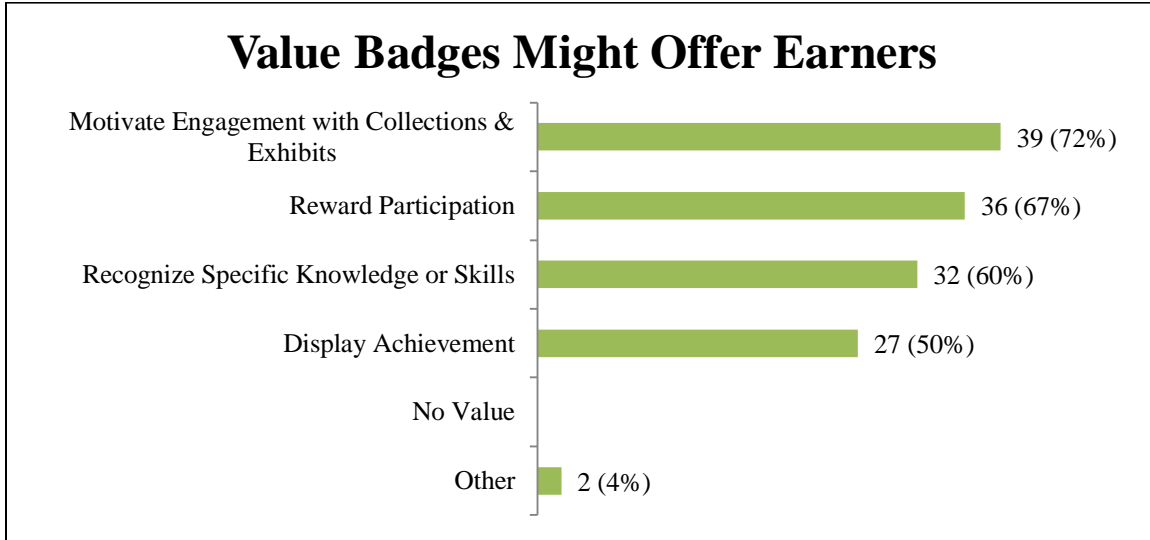
Increase ticket sales and revenue.

-Director Exhibit Media at Science/Tech Museum

Recognize and document learning in our programs

-Director of Education at an Art Museum

Figure 19 What value might digital badges offer your audiences? Select all that apply.
n=54



Potential Issuers most frequently indicate that their future digital badges may be valuable because they will motivate earners to engage with the museum’s collections and content. Benefits related to rewarding participation and recognizing learning are also commonly noted among respondents. These responses differ from that of Current Issuers, who indicate that displaying achievement is a key value for earners (see Figure 7 on page 45).

Potential Issuers: Assessment and Perceptions

In order to further explore the perceptions reported by Potential Issuers, it may be useful to distinguish between the subgroups of Intended Issuers, who “Plan to Use” badges, verses Non-Issuers, or those who have “No Plans to Use” badges. For comparison, Current Issuer responses are also included.

Table 6 What are the biggest challenges related to digital badges? Select all that apply.
Current Issuers n=16, Intended Issuers=20, Non-Issuers n=35

Biggest Challenges Related to Badges	Current Issuers	Intended Issuers	Non-Issuers
Lack of guaranteed return on investment or way of measuring effectiveness	8 (50%)	4 (20%)	11 (31%)
Strategy does not fit with the culture of my institution	2 (12%)	4 (20%)	9 (26%)
Badges aren't taken seriously by visitors	7 (44%)	5 (25%)	5 (14%)
Badges issued by my museum aren't validated or useful outside of my institution.	7 (44%)	6 (30%)	18 (51%)
Expensive or difficult to implement	3 (19%)	12 (60%)	16 (46%)
Inconsistency regarding the purpose and goals of badges	5 (31%)	7 (35%)	19 (54%)
No drawbacks	0 (0%)	1 (5%)	0 (0%)
Other	2 (12%)	5 (25%)	6 (17%)
Total Respondents	16	20	35

All three subgroups identify a different challenge that they feel is most difficult to implementing badges. Current Issuers express concern about the lack of guaranteed return on investment or way of measuring their program's effectiveness. Intended Issuers suggest that there are financial barriers related to establishing a badge program. Non-Issuers more often imply that the biggest challenges relate to inconsistent goals and external validity. In summary, these results may suggest common challenges that relate to the different stages of badge implementation, an idea that will be further explored in Chapter Six.

Additional comments provided by Non-Issuers allude to technological challenges, which may also correlate to this subgroup's expressed concerns about implementation.

For example:

There remain significant technological and UX challenges with making these sort of experiences work in the physical exhibit space. How do you link a physical visitor to an online presence?

- Director Exhibit Media at a Science/Technology Museum

Are digital badges getting to the students who need them most? Access to technology?

- Director of Education at an Art Museum

Another Intended Issuer indicates an uncertainty about the efficacy of digital badges as a pedagogical tool:

Just not sure that they're a good learning tool; may distract from visit rather than enhance; concerns about being 'Gimmicky.'

-VP, Exhibits, Facilities, and Digital Initiatives at a Science/Technology Museum

The “Other” comments provided by the Non-Issuer subgroup further reflect concerns about inconsistency, a badge’s ability to document learning, as well as the investment required for implementation. Examples include:

I see little accountability for actual content mastered, especially across different sites.

-Associate Curator of Education at an Art Museum

Hard to invest time/energy to set it up on our own, would be great to be part of a larger citywide cultural badge program.

-Exhibit Developer/Oral History Program Manager at a Natural History/Anthropology Museum

Limited resources to develop and implement badge program.

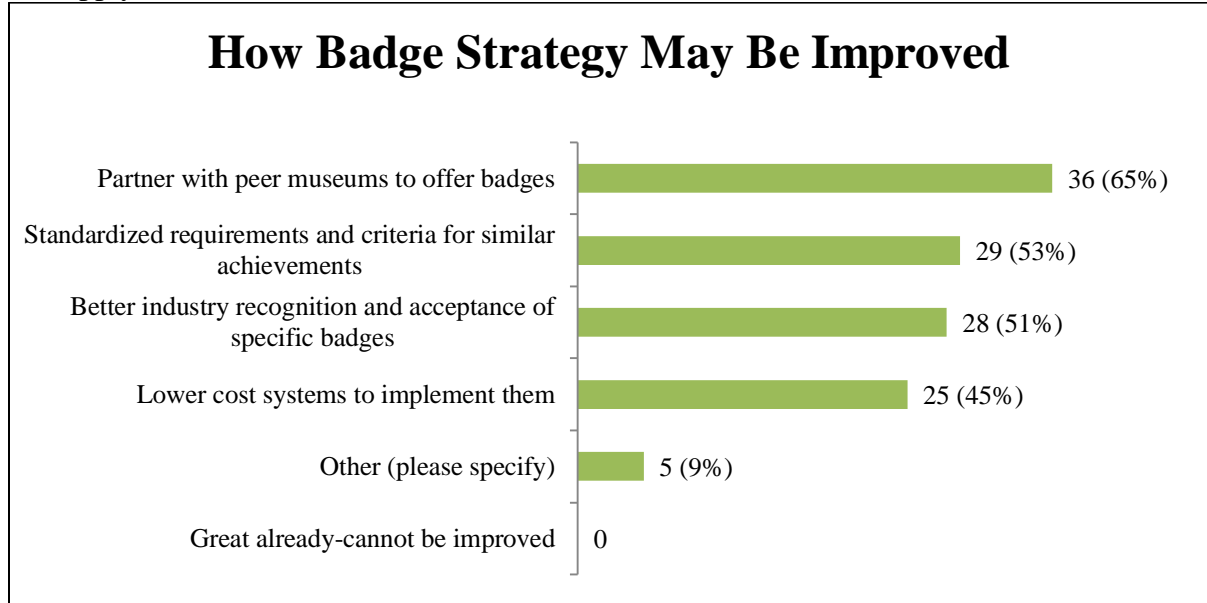
-Marketing Manager at Science and/or Technology museum

Another response illustrates one element of this researcher’s earlier assertion about why “No Plans to Use” is selected; in some cases, an institution has not fully considered badges:

Haven't investigated enough to determine challenges.

-Deputy Director at a Science/Technology Museum

Figure 20 How could the strategy of digital badges in museums be improved? Select all that apply. n=55



While 65% of Potential Issuers identify partnerships as a way to improve the strategy of digital badging in museums, there are also slight distinctions between the subgroups within this category that may be useful to explore. Table 7 illustrates how the responses between Intended Issuers and Non-Issuers slightly differ. For comparison, Current Issuer responses are also presented.

Table 7 How could the strategy of digital badges in museums be improved? Select all that apply. Current Issuers n=16, Intended Issuers n=20, Non-Issuers n=35

How could the strategy of digital badges in museums be improved?	Current Issuers	Intended Issuers	Non-Issuers
Partner with peer museums to offer badges	10 (62%)	14 (70%)	22 (63%)
Standardized requirements and criteria for similar achievements	3 (19%)	12 (60%)	17 (48%)
Lower cost systems to implement them	6 (37%)	11 (55%)	14 (28%)
Better industry recognition and acceptance of specific badges	12 (75%)	8 (40%)	20 (57%)
Other	1 (6%)	3 (15%)	2 (6%)
Great already-cannot be improved	0 (0%)	0 (0%)	0 (0%)
Total Respondents	16	20	35

Those who plan to implement badges (Intended Issuers) more often indicate the need for badge standardization and lower cost systems. In comparison, respondents who have no current plans to implement badges (Non-Issuers) indicate a higher need for industry recognition and acceptance of specific badges and less frequently select “Lower cost systems to implement them.” While on one hand this variance may be arbitrary, it may be suggestive of the slight differences in perceptions between those who anticipate implementing badges and those who have no plans to do so. The implications of these discrepancies between Intended Issuers and Non-Issuers will be further explored in Chapters Six and Seven.

“Other” responses from Intended Issuers relate to issues around developing standards and methods of assessment. Examples include:

Better indicators that badges are valued by audience and have meaning identifying engagement/accomplishments.

- Education Coordinator at a Natural History/Anthropology Museum

Widely sharing data on effectiveness as a learning tool.

-VP, Exhibits, Facilities, and Digital Initiatives at a Science/Technology Museum

“Other” responses from those with No Plans focus on a desire for partnerships. One sample states:

Develop a city-wide systems such as what they have in Chicago.

-Program & Communications Manager at a Science/Technology Museum

While 57% of the subgroup identified the importance of improving industry recognition, one respondent also addresses the issue of public acknowledgement:

Public recognition and engagement with digital badging.

-Children's Educator and Outreach Coordinator at a Science/Technology Museum

Table 8 “How would you rate the following possible challenges to implementing digital badges in your museum? n=55

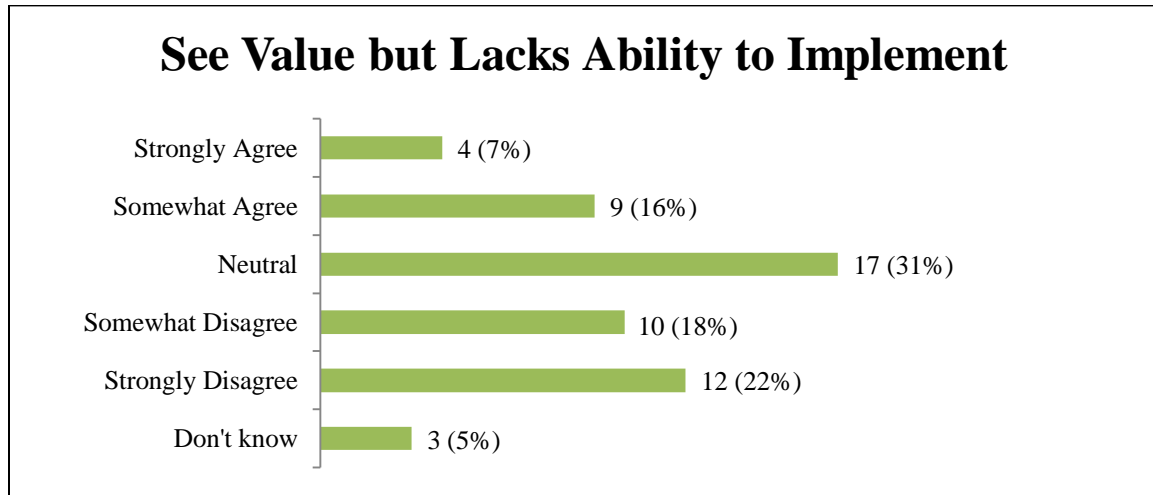
Possible Challenges to Implementation	Very	Somewhat	Neutral	Not Very	Not at All	Don't Know
Internal Funding	21 (38%)	20 (36%)	4 (7%)	8 (15%)	1 (2%)	1 (2%)
Creating and Maintaining Content	17 (31%)	16 (29%)	7 (13%)	3 (5%)	1 (2%)	2 (4%)
Inconsistency Regarding the Purpose of Badges	9 (16%)	24 (44%)	11 (20%)	8 (15%)	1 (2%)	4 (7%)
External Funding	15 (27%)	14 (25%)	7 (13%)	4 (7%)	1 (2%)	1 (2%)
Ability to Measure Effectiveness	10 (18%)	18 (33%)	12 (22%)	7 (13%)	1 (2%)	7 (13%)
Assessing a Badge Earner's Learning	9 (16%)	18 (33%)	15 (27%)	8 (15%)	0 (0%)	2 (4%)
Visitor Demand	9 (16%)	14 (25%)	16 (29%)	7 (13%)	0 (0%)	9 (16%)

When comparing responses between Intended Issuers and Non-Issuers, this researcher identified no measurable differences in how these subgroups rank the possible

challenges to badge implementation. This stands in contrast to the previous multiple choice survey question presented immediately before, “What are the biggest challenges to digital badges?” This difference may be attributed to a number of factors that will be addressed in Chapter Six.

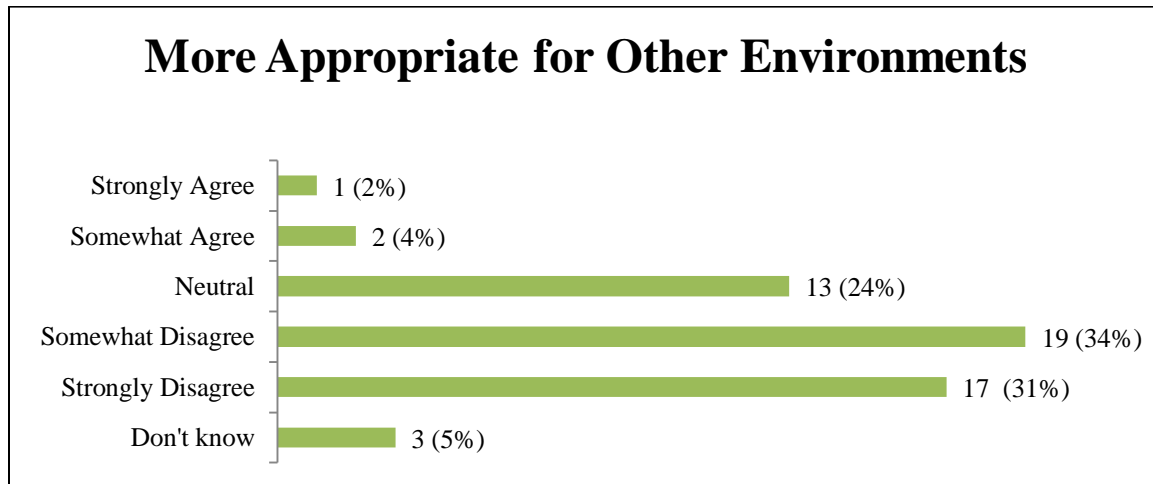
The issue most frequently noted as “Very Challenging” among all Potential Issuers is Internal Funding. Seventy-four percent of Potential Issuers identify this issue as at least “Somewhat Challenging” and 38% of this group indicates that it is “Very Challenging.” A discernible percentage of Potential Issuers indicate there are multiple issues that may present at least somewhat of a challenge implementing badges. The issues most frequently indicated as the least challenging among Potential Issuers relates to assessing a badge earner’s learning, and visitor demand, however, this only represents 9 respondents, or 16% of this subgroup.

Figure 21 To what extent do you agree or disagree with the following statement: Our organization sees the value of digital badges, but lacks the ability to implement them? n=55



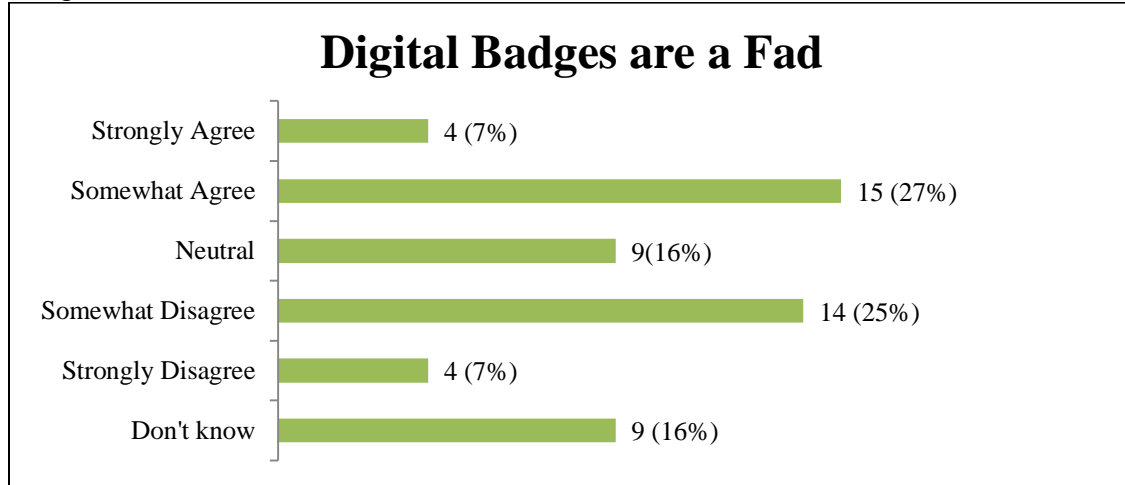
Less than a quarter of respondents imply that they lack the ability to implement digital badges. This may suggest that many respondents do not perceive the administrative, financial, and technical requirements to be too prohibitive.

Figure 22 To what extent do you agree or disagree with the following statement: Digital Badges are more appropriate for commercial or formal educational environments than museums? n=55



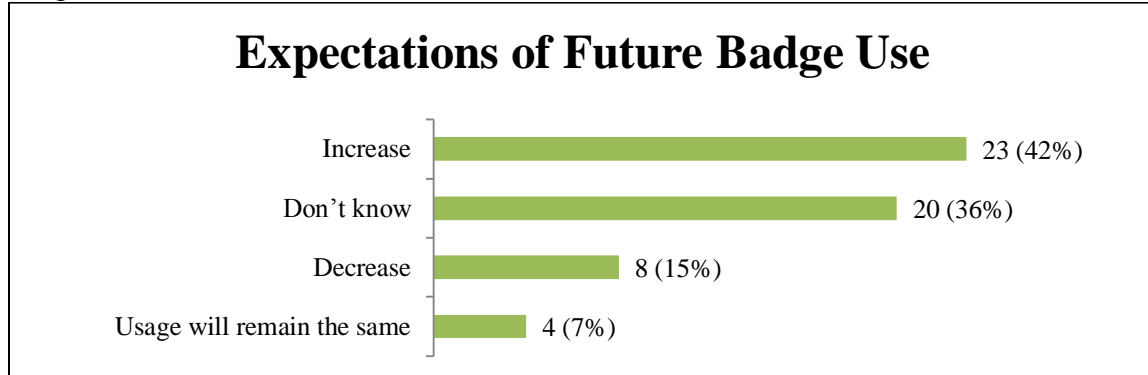
Like most Current Issuers (see Figure 12 on page 50), Potential Issuers seem to suggest that the museum is an appropriate context for digital badge implementation.

Figure 23 To what extent do you agree or disagree with the following statement: Digital Badges are a Fad? n=55



As noted earlier, this question was inspired by a critique of digital badges this researcher identified in the early stages of this study. It intends to better understand the perceived long-term viability of digital badges among Potential Issuers. Similar to the responses provided by Current Issuers, these results do not imply Potential Issuers have a unified stance: 34% of Potential Issuers express some agreement with the statement, while 32% indicate they disagree.

Figure 24 Do you expect that museums will increase or decrease their use of digital badges in the future? n=55



Similar to Current Issuers, Potential Issuers do not have unified expectations regarding the future of badging in museums. Unlike Current Issuers, some Potential Issuers expect that badges will continue to be used at their present rate.

Conclusion

In summary, these data indicate that museums are interested in a discourse about the viability and utility of digital badges within informal learning. Digital badge programs can be designed to engage a variety of audiences and can function in both online and in-person contexts. They may help to achieve specific institutional goals and be a valuable tool for earners. Museums have differing opinions about the strengths and challenges related to badge implementation, as well as what the future landscape may hold. While these data identify a range of attitudes and experiences, they also reveal many trends and commonalities that may help to inform the future of badge practice within the museum field. For instance, museums seem to be most interested in implementing badge programs that enhance the way their audiences learn and participate. Common challenges include creating and maintaining badge content, negotiating badge earner motivations, and assessing learning. Partnerships are often acknowledged a way to

overcome technical and financial constraints, and establish badge validity. Many of these themes will be illustrated in the Case Studies presented in Chapter Five, and further discussed in Chapter Six. Additionally, Chapter Seven will explore how these findings may be applicable to the museum field.

CHAPTER FIVE: Case Studies from the Museum Field

Introduction

The following case studies further explore how digital badges are being utilized and perceived by museums professionals. They also serve to corroborate and support the quantitative and qualitative data presented in Chapter Four, and shed light on some perceptions, common limitations, and unique strengths related to digital badging in museums. Three studies highlight current digital badge projects within the museum field. Two additional studies represent the perceptions of institutions that do not plan to implement badges. Each case study also includes a series of recommendations or questions that may serve as a practical guide for institutions interested in exploring or implementing digital badges in the future.

These case studies are based on in-person or phone interviews that were recorded and transcribed. Interviewees first participated in the online survey and were selected based on their willingness expressed in the survey's optional comments section, to share more about their experiences with or perceptions of digital badges. Additional factors contributed to the inclusion of these three badge issuing institutions, such as their unique badge earner audiences, program goals, badge function, strengths and limitations. Similarly, the non-issuing institutions were selected based on their unique perspectives that highlight some of the common theoretical and practical concerns addressed in the literature and expressed by survey respondents, such as the ability to assess learning, badge validation, and the value badges can provide earners.

The interviews were semi-structured in nature. The researcher presented a series of questions to each interviewee, and allowed for follow-up comments, elaboration, and exploration of ideas that were unique to the individual's experience with digital badges.

Case Studies at a Glance⁸²

Institution	John G. Shedd Aquarium	History Colorado	Denver Art Museum	Frick Art and Historical Center	Wagner Free Institute of Science
Location	Chicago, Illinois	Denver, Colorado	Denver, Colorado	Pittsburgh, PA	Philadelphia, PA
Annual Budget	\$56.02 million	\$10 million	\$27 million	\$5 million	Just over \$1 million
Staff Size	268 full-time & 227 part-time/temp	107	218 full-time & 180 part-time	Approximately 35 full-time & 100 part-time	9 full-time & 4 part-time
Annual Attendance	1.8 million	175,000	685,000	120,000	37,000
Badge Earner Audience	Teachers	3 rd -4 th , 7 th -8 th & High School Students	General Admission Visitors	n/a	n/a
Location of Use	Online	Online in School Classrooms	Onsite	n/a	n/a
Interviewee(s)	Miranda Kerr, Coordinator of Digital Learning	Laura Douglas, Digital Project Coordinator	Michelle Lim, Digital Engagement Programs Assistant Melora McDermott-Lewis, Chief Learning Engagement Officer Matt Popke, Developer	Laura Beattie, Associate Curator of Education	Cara Scharf, Program & Communications Manager

⁸² See appendix B for an additional matrix that highlights some of the characteristics of each institution's and digital engagement model.



Institution: John G. Shedd Aquarium

Location: Chicago, IL

Annual Budget: \$56.02 million

Staff Size: 268 full-time & 227 part-time/temporary

Annual Attendance: 1.8 million

Project Name: Great Lakes Teacher Badging & Early Science Learning Badging

Badging Audience: Teachers

Location of Badge Use: Online

Interviewee: Miranda Kerr, Coordinator of Digital Learning

Project Impetus

In 2012, Shedd Aquarium's Education division underwent some restructuring as well as a new moniker: Learning Programs. Around this time of transition, the department began to explore how the aquarium might be able to extend its impact and reach new audiences through digital programs. A Digital Learning team was formed to help usher in this work and one of the team's first projects was an online professional development program for teachers. The program was based on a review of digital learning and teacher professional development literature, as well as extensive background evaluation and needs assessments of the motivations, pressures, and interests of teachers. An online survey was shared via Shedd's educator newsletter, and over 400 teachers shared their views and needs for professional development opportunities.

Coordinator of Digital Learning, Miranda Kerr, summarizes some themes that emerged within the replies:

Teachers have a lot of schedule constraints and were seeking professional development opportunities they could do on their own time, that were also low-cost. They wanted curriculum that connected to the classroom, and wanted to connect to Shedd Aquarium staff and other teachers. We could do all of those things with digital badging.


Launched in 2013, Shedd's first badging initiative was the *Great Lakes Science Teacher Badging*, a program originally designed for teachers in both primary and secondary classrooms. Rather than restrict its audience to specific grade levels, the program is intentionally broad in reach: "It's more about content and letting the teacher feel comfortable and confident in teaching Great Lakes science and general science literacy," Kerr notes. Some of the primary goals outlined in the first pilot year of *Great Lakes Science Teacher Badging* were to:

- Foster an online learning community for teachers
- Increase teacher competence and confidence in teaching about the environment and science and integrating 21st century skills
- Provide useful classroom connections to teachers of a variety of grade levels⁸³

Among the considerations made within this first year, Shedd carefully monitored the time commitment the program required of teacher participants as well as aquarium staff, to better assess the long-term feasibility of an online digital badging model.

⁸³ Shedd Aquarium. "Learning Planning & Evaluation: Great Lakes Teacher Badging Evaluation Report." Prepared by Heather Schneider, Feb 17, 2014.


Figure 25 View of Badges webpage. *Source:* Shedd Aquarium.



[Home](#)
[Dashboard](#)
[Badges](#)

[Members](#)
[Forums](#)
[FAQs](#)
[Contact](#)


Badges



Intro to Badging

This badge will welcome you to the platform!
By personalizing your profile and checking out some of the site's features, you'll be a pro in no time!

[Show Details](#)




Great Lakes

Introducing...the Great Lakes!
The Great Lakes Basics Badge is to get everyone on the same page before we dive into Great Lakes Science. This badge gives a brief overview of the Great Lakes Basin, shares the importance of the Great Lakes, and introduces some of the current issues surrounding the Great Lakes. Also, look out for additional classroom resources along the way.

Completing this Badge successfully means...
You have some background on the Great Lakes and are ready to move on to the next badge.

[Show Details](#)




Invasive Species

Getting to know Great Lakes Invasive species
The Goal of this badge is for you to gain basic background information and insight on invasive species of the Great Lakes. The missions within this badge will help you gain a better understanding of the topic in preparation for activities in level three.

Completing this Badge successfully means...
You will have scratched the surface of understanding more about terminology associated with invasive species, methods of how invasives were introduced and ways to prevent further introduction.


[Show Details](#)



Environmental Literacy





Explored animals and their habitats, making connections and increasing understanding on how science can play a role in solving ecological challenges.

Hi Miranda Kerr




[profile](#)
[log out](#)

My Badges

 Environmental Literacy
  Science Literacy
  Great Lakes Science Certified
  21st Century

@SheddLearning Twitter

Tweets [Follow](#)




Tessitura Network
@TessNetwork

Amazing education work going on at #tessnet member @shedd_aquarium with @SheddLearning twitter.com/SheddLearning/...

Retweeted by Learning with Shedd

[Expand](#)




Renee Birk
@ReneeAtShedd

"It's time to give non traditional education a chance. Allow us to be the explorers and innovators." David Gonzalez #NAAEE2015

Retweeted by Learning with Shedd

[Expand](#)



Alex Herrera
@AlexHVDO

#clubshedd teens in inclusion and accessibility team working on interactive...

Badging Platform

Shedd enlisted the technical expertise of the online learning company LearningTimes to develop the project's website and host the badging platform through its well-known system, BadgeStack (now known as BadgeOS). After a successful pilot year, and enthusiastic about the future of its digital initiatives, Shedd decided to rebuild and manage the Great Lakes and future badge program websites internally, while still offering its badges through the BadgeOS platform. Using WordPress, the aquarium's IT staff developed the website's basic 'shell' and pages, and the Learning Programs staff began to create and maintain the content. The program was re-launched on Shedd's own website in March of 2015.

While the feasibility of maintaining and funding the technological components of a digital badge program is a commonly cited challenge among badge issuers and potential issuers, Shedd has found that these elements of badging are neither cost-prohibitive nor too logistically difficult to manage. Kerr explains:

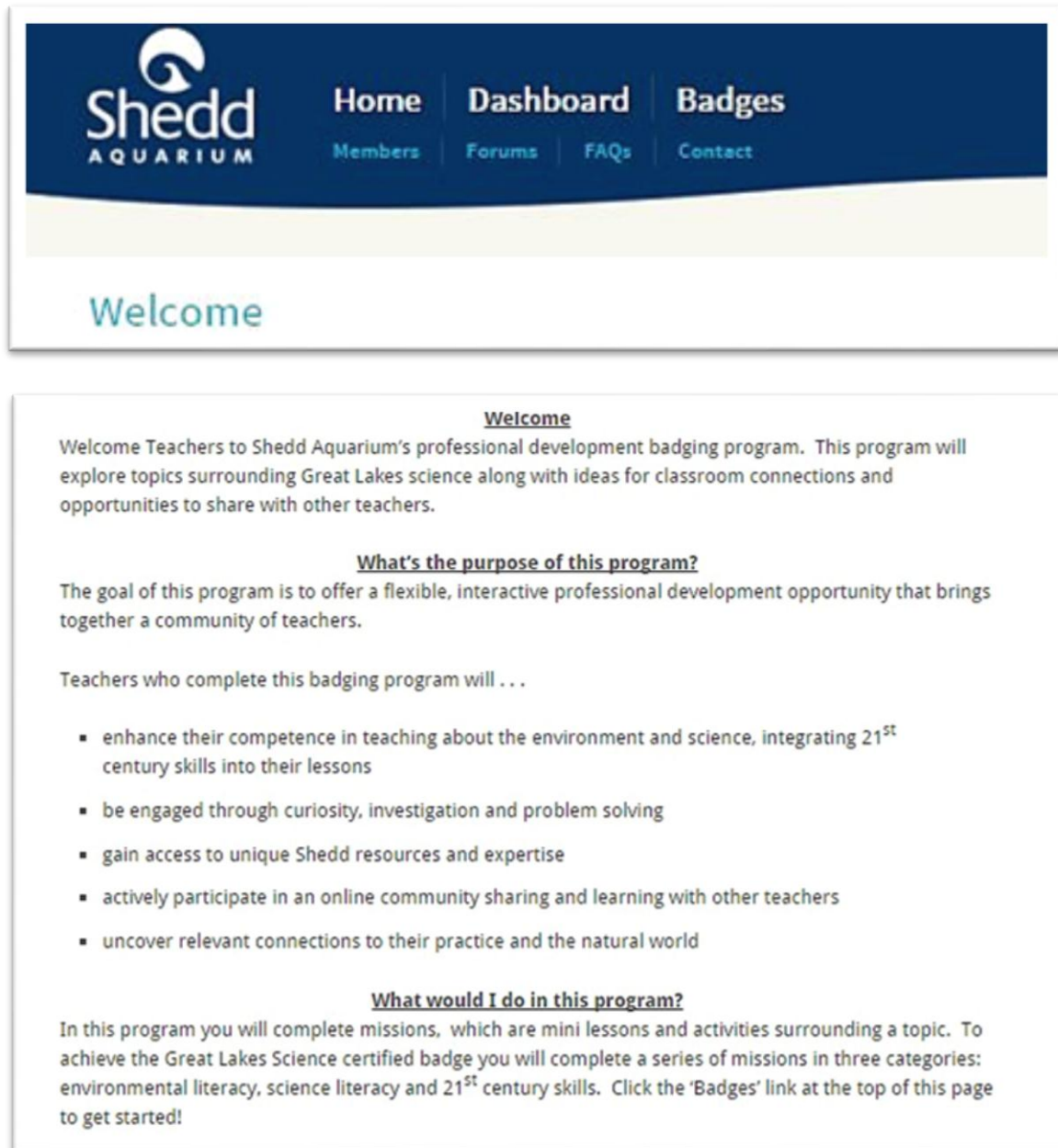
The nice thing about creating this in Word Press is having more control over the content at any given moment. The actual template for making a badging program is available for free from LearningTimes. Each badging site is built by our internal IT team. Our Learning Programs staff has enough knowledge of using Word Press now that we can paste in the content for each page, embed photos and videos, and make minor changes to the HTML. It's pretty user-friendly and I don't have a background in web development.

Badge Earning Process

Upon registering, a teacher is provided with basic login instructions. The first set of missions directs users to update their profiles and get started on exploring the science content. The process of earning badges includes a variety of activities that range in length

and required effort. A badge may require a teacher to write a reflection, submit a photograph, design a basic experiment and/or share ideas through an online discussion.

Figure 26 Example of Teacher Welcome Page. *Source:* Shedd Aquarium.




Each badge includes “missions,” or activities that are required in order to earn a badge.

Kerr describes the basics:

On average, 3 or 4 missions are included within each badge. Some of the introductory badges might have fewer missions, or the missions might be simple to complete. Then as teachers dive deeper into developing their science literacy skills, they are asked to write a plan of how they're going to bring this content to their classroom. Badging programs are scaffolded, with content building on itself from mission to mission, and badge to badge.

Figure 27 Example of a Mission Description. *Source:* Shedd Aquarium.

Importance of the Great Lakes



Mission Description

Mission Description
Over 35 million people reside within the Great Lakes basin. People use the Great Lakes for drinking water, irrigation, transportation and recreation opportunities such as fishing, hunting, boating, and wildlife watching. The Great Lakes basin also contains habitats for wildlife, including species of fish, mammals, and both resident and migratory species of birds.

To read more about why the Great Lakes matter, check out Shedd Aquarium's website on [Great Lakes Conservation](#).


If you want more information on the wildlife found in the Great Lakes basin, you can find a [more detailed list](#).

For this mission, we will focus on just one of the reasons why the Great Lakes are important: water. The Great Lakes watershed is a source of drinking water for over 30 million people in the United States and Canada.

Completing this Mission successfully means...
You've discovered that the Great Lakes are an important source of drinking water and some ways you can help to conserve water.

Your Mission
After watching the "Water—From Our Home to Yours" video, think about how Shedd Aquarium was able to conserve water and energy in Ty's, the California Sea Lion, exhibit.

Using the examples from the video, or your own ideas, brainstorm ways you can conserve water in your home. Looking for more ideas? Check out the EPA "Test Your Water Sense" game in the Classroom Connections section below.



Submit your Mission Assignment
Explain at least two ways that you personally can help conserve water.

Figure 28 Sample Digital Badge Icons. *Source:* Shedd Aquarium

The *Great Lakes Science Teacher Badging* program has six badges that include: Intro to Badging, Science Literacy, Great Lakes Basics, Invasive Species Defined, Environmental Literacy, and 21st Century Skills. If a teacher completes all six badges, they earn their Great Lakes Science Certified badge.⁸⁴



Teachers can choose how they wish to participate in the *Great Lakes Science Teacher Badging*:

Continuous Learning: This track allows teachers to explore their personal interests at their own pace, at no cost. If they choose to complete the 6 badges, teachers will receive a letter that documents their experience that can be shared with school administration.

Clock Hours: Each year, Illinois teachers must complete a certain number of Clock Hours in order to maintain their certification. For a minimal fee, teachers who complete the 6 badges can earn 20 Clock Hours, as well as a letter that can be shared with school administration. A \$10 fee is required.

Graduate Credit: Through a partnership with National Louis University (NLU), teachers can now earn one semester hour of graduate credit. A bit more time-intensive, this option requires an earner to complete some additional assignments in addition to the badging missions. NLU charges a \$148 tuition fee.

While *Great Lakes* has been modified and utilized by preschool teachers, the Shedd has also designed a program specifically for this audience: *Early-Science Learning Teacher Badging*. This inquiry-based program is similar in length to the *Great Lakes* program, is self-paced, free, and can be completed for 20 Clock Hours. Kerr explains how this initiative specifically serves teachers who work with younger learners:

Previously, we had offered an in-person program where one of our educators would go into schools and partner closely with teachers, but we wanted to reach even more teachers. Teachers go through mission

⁸⁴ Shedd Aquarium, p.2.

activities like how to set up a science center in their classroom, how to get young children to ask questions, and how to build confidence bringing science into a pre-K through 3rd grade classroom. We want teachers to feel comfortable with how to lead young audiences through inquiry investigation.

The aquarium is currently developing a third badging program for teachers that will be content-based, but will include fewer activities and will likely be less time-intensive.

Digital Badge Audience

Shedd's badging programs attract teachers from across the Chicago area, multiple states and a few countries. While all of its badging programs for educators are online, the aquarium still encourages teachers to recognize the positive impact a museum visit can have on themselves and their students. For instance, participants in the *Early-Science Learning* program are asked to plan a hypothetical field trip. The primary goal of the activity is to get teachers thinking about how aquariums, zoos, and museums offer resources that might help connect their students to science. If they choose to take a field trip, Shedd enthusiastically welcomes them, however none of the missions require badge earners to come to the aquarium. Again, Kerr reiterates, "we're hoping to reach that broader audience of educators and not necessarily just hit people that could drive to the aquarium." Kerr provided a summary of badge program participation. As of September 2015:

Early-Science Learning Teacher Badging:

116 have completed at least one badge in the program

26 have completed the entire program (20 hours)

Approximately 450 teachers have logged in to the system

Great Lakes Science Teacher Badging:

115 have completed at least one badge in the program

28 have completed the entire program (20 hours)

More specifically, since the March 2015 re-launch of the Great Lakes project within the Shedd's internal website:

- 37 teachers have registered for the continuous learning option
- 24 teachers have registered for the clock hour option
- 1 teacher has completed the program for graduate credit

Not all audiences will have the same motivation for earning badges. Rather than earning the badge solely for recognition or credit, Kerr finds that teachers are often motivated by their own personal interests and a love of learning:

I think we're a little unique among badging programs because we started with the educator audience. The biggest thing for this audience that I've found interesting is about how they view "badges." Some of them share the badges and post them to social media, or save the badges to their digital backpack. However, for most participants, these badges are about scaffolding, and building on their knowledge. They can check their progress by how many missions are left to complete a badge. They can see the layout of the professional development in front of them to understand how submitting missions gets them closer to earning the badge, and completing the program.

Goals of Badges

Not only does the nature of Shedd's badging programs connect teachers to the aquarium, it also enables teachers to share ideas and resources and build an online community through discussion forums. Kerr elaborates:

There were some preschool teachers that wanted to take the *Great Lakes* badging program, even though it wasn't originally designed for early learners. These teachers started talking in the discussion forums and sharing ideas with each other. With a topic like invasive species, something that you might not want to introduce at a preschool level, they brainstormed how they could talk about the environment or early science concepts that would resonate with that age group. They came away with some really fun and relevant ideas.

Strength: Providing Earners with Personalized Feedback

Shedd's online badging programs require ongoing monitoring and maintenance. Each time a participant completes a "mission," Shedd staff must review and approve or deny what has been submitted. While this may sound like a considerable task, the aquarium has developed a system they find is manageable for staff and insures that the badging initiatives are running smoothly. Kerr describes this process:

You could implement any management plan you need, but what works for us is having two Learning staff members take turns approving missions. They have on their calendar to check at least every other day, so each Monday, Wednesday, and Friday one of them will review submissions for about an hour . . . Submissions may take only a few minutes to check or much longer, depending on the mission, so the weekly time commitment varies widely. Anecdotally, we've seen a bit of a lull at the beginning of the school year as teachers return to their classrooms. However, after Spring Break, or after we're presented on our badging programs at a conference, staff may have many missions to review.

Audience Feedback

In addition to providing personalized responses to each badge earner, the Shedd also seeks participant feedback. For instance, the final badges within the *Great Lakes* and *Early-Science Learning* programs include completing a survey and reflection. Kerr is enthusiastic about the participant feedback:

For teachers that complete the program, all the reflections have common themes. Teachers state 'I have more confidence teaching science' and 'I learned so much about the Great Lakes.' Teachers appreciated the type of format and want to know if we're going to offer more badging programs, which is great feedback. One teacher stated, 'This is the best professional development program I've ever done.' It's great to see that teachers feel empowered to bring more science, or more Great Lakes content to their classrooms because of this digital badging program.

While not every person who enrolls earns all of the digital badges, Kerr believes this is part of the self-directed nature of the program.

One thing we noticed is that a lot more teachers sign up than complete the program, particularly in *Great Lakes*. But we think that's okay, because there might be teachers who sign up who just want to get some background in Great Lakes science or a background in invasive species. We've also had teachers tell us that they've been assigned to a different position or grade level and the program no longer meets their needs.

Funding & Partnerships

Each of Shedd's badging initiatives receives funding from a variety of sources. The USDA Forest Service partially funds the *Great Lakes Science Teacher Badging* program. The *Early Science Learning Teacher Badging* was initially part of a multi-institutional grant through PNC Grow Up Great that also included The Museum of Science and Industry, The Adler Planetarium, and The Field Museum. Each institution played a specific role within the project that focused on science for early learners. Shedd, for instance, created the *Early Science Learning* badging platform and content.

While many of its badging programs are based on internal content, the aquarium is happy to share their badging expertise with others, and has received funding to explore how badging might be useful in other contexts. Kerr describes her involvement in a project to explore how badges might serve as valuable credentials within the workforce:

Through a grant from the HIVE network,⁸⁵ we worked with a few organizations to explore how Human Resources departments might use badges. We invited individuals from Human Resources departments, including Shedd's internal HR staff, to provide feedback on what it could look like if HR departments started taking badges on their applications.

⁸⁵ HIVE Learning Networks are comprised of organizations (libraries, museums, schools and non-profit startups) and individuals (educators, designers, community catalysts and makers) that seek to create opportunities for youth to learn within and beyond the confines of the traditional classroom. There are HIVE Learning Communities and Learning Networks throughout the United States, Europe and Asia. For more information visit, <https://hivelearningnetworks.org/>

Human Resources staff posed questions such as: What does that badge mean? Who issued it? What skills does it show that the person earned? What can we do with this information?

Recommendations for the Museum Field

There are many factors to consider before implementing a digital badge program.

Kerr suggests that an institution must examine the goals and motivations of a badge program, both in terms of its institutional impact, as well its foreseeable value for participants.

In my opinion, one thing you need to consider for any type of badge program is motivation. For our work with teachers, it's a very clear motivation. Teachers want to learn how to bring science to young learners in their classroom. Teachers take this program to learn about the Great Lakes and how to develop their science literacy skills, maybe specifically about invasive species issues. They have a clear reason why they're taking the program. Then as they move through earning badges, they are meeting those learning goals, and maybe also earning their Clock Hours. Being clear about why they would want to earn those badges, or what they would use them for, is key. Our system provides a way for teachers to track their progress and have a visual path laid out in front of them of how to complete the program. If you're developing a teen badging program, what will teens do with those badges? Does earning a certain number of badges unlock an internship? Does it allow them to apply to another program? Is it something that is standardized that they can put on a college application? I think those types of questions are really important before you get started. What is the motivation for the participant who wants to earn this badge?

Additionally, Kerr emphasizes how soliciting feedback from audiences prior to implementing a badge program can help to inform the initiative's design and goals:

Having that large sample size pre-survey before we ever got into badging was very helpful. Knowing that teachers wanted that personalized feedback set us on the course of saying, 'we are going to respond to every mission that is submitted with a personalized comment.' How long those comments are varies, but even if it's a sentence or two, it shows that our

staff has read your submission and is responding to you, making personal connections.

Kerr also offers some advice for those considering digital badge programs designed specifically for teachers. As inferred in her earlier comments on badge-earner statistics, Kerr also feels it is important to create reasonable expectations for participation rates:

You'll notice that at least in the case of our programs, we have found that you need a large number of participants to enroll, because there is a drop off rate before completion. Teachers may change grade levels or schools, or districts may shift curriculum focus, and the program may no longer be a good fit for them. Teachers may have enrolled to complete just the first few badges, for the background information on Great Lakes or Invasive Species. While the flexibility to complete this program on their own schedule is a benefit to teachers, it also means they may take an extended period of time to finish. For a program on teacher professional development, I would suggest enrolling more participants than you expect to complete the program.

What's Next

After its successes in implementing digital badge programs for teachers, Shedd is now considering how badges might be effective tools for other audiences. Currently, the aquarium is developing a badging program for its volunteers. Shedd's Guest Engagement team that is guiding this initiative is in the process of developing the badge platform and has already created one badge that is being prototyped by volunteers. A blend of both onsite and online training, earners will complete some activities at the museum, and other activities are completed online. At home, one might watch a video of a staff member doing an interpretation, or take a quiz about penguin facts. While at the aquarium, one might shadow a tour guide, or practice their interpretation skills in front of staff members. Some of those in-person activities will be followed by a reflection assignment online. If a

participant does not have home computer or internet access, they may use computers in the museum's volunteer office to complete the online components. Kerr described the impetus for the volunteer program:

We want to grow our volunteer base, and maximize our staff resources. [A badge program allows] our staff to still make great connections with our volunteers and train them effectively, but also alleviates the pressure it takes staff to train volunteers in places where it makes sense. It's very important to have part of that training still be in-person, but there are pieces that could be done in a volunteer's own time, or online. Volunteers were asking for additional ways to learn more about Shedd's collections and what we're up to. The volunteer badging website provides them the opportunity to read articles, watch videos, refresh their knowledge, enhance their training, and learn new things. Volunteers have also asked for more connection with each other and we're hoping this helps to create an online meeting space for them.

While the Guest Engagement staff is helping to engage this new badge-earner audience, Kerr is developing a resource that will help introduce and connect the larger Shedd staff to their digital badging methodology:

Obviously we're big proponents of badging and are looking at ways we can expand and use badges with different audiences, such as our volunteers. As the Coordinator of Digital Learning, one of the things I'm working on is creating a badging tool-kit that other staff can use. We want to record all of this information, because if we're going to grow our programs and include other staff we have to make sure we have the process documented and provide a reference.

As the Shedd hires new staff or assigns current staff to badging work for the first time, the Tool-kit will serve as a comprehensive institutional resource about digital badging. It will cover everything from a basic introduction to 'what is digital badging' and why and how it is used at the museum, to instructions in how to approve missions, update content, and examples of how to provide meaningful written feedback to

participants. While the Tool-Kit is still in development, Kerr thinks that ultimately it may be a valuable resource the Shedd can share with other institutions.

For more information about Shedd's digital badging initiatives, visit:

[http://www.sheddaquarium.org/Learning-Experiences/Educators--
Classrooms/Professional-Development/Great-Lakes-Badging/](http://www.sheddaquarium.org/Learning-Experiences/Educators--Classrooms/Professional-Development/Great-Lakes-Badging/)



HISTORY *Colorado*

Institution: History Colorado

Location: Denver, Colorado

Annual Budget: \$10 million

Staff Size: 107

Annual Attendance: 175,000

Project Name: Online Exhibits & Digital Badges

Badge Earner Audience: Classroom students

Location of Badge Use: Online in classrooms

Interviewee: Laura Douglas, Digital Project Coordinator

Project Impetus

History Colorado is a statewide network of twelve historic sites and museums that include public education program and exhibitions, a research library, and an active publications department. Each year, these sites engage a diverse audience of nearly half a million visitors. In June 2008, Colorado's Governor signed legislation that allocated funding for a new building to hold several entities, including the State Justice Center, Office of Archaeology and Historic Preservation, and History Colorado Center, History Colorado's flagship museum and resource center in Denver. The new facility opened to the public in April 2012. In preparation for this move, the museum staff had spent many months researching and designing the exhibits for their new space. They sorted through their collections, photos from across the state, videos, and visited communities to gather feedback about what audiences wanted to see. Not surprisingly, it was impossible to present all of the gathered content within an onsite experience. Laura Douglas, Digital Project Coordinator, describes their decision to create opportunities for virtual participation and how digital badges almost effortlessly became part of this approach:

We were lamenting the fact that so much work went into this process and were trying to find a way to share this information. Museums use open storage and find other ways to show their stuff that is behind closed doors. We decided to put it up online . . . and thought, “wouldn’t it be cool if we could present all this info to kids and then quiz them somehow?” When we came up with the idea of quizzing people on what they looked at on our website, we didn’t realize anyone else was doing it, and actually no one was doing it very much. We didn’t realize there was this thing called ‘digital badges’ and thought we had developed this brand new idea.

Launched in late 2014, the first online exhibit and badge project tells the story of Amache, an internment camp in Granada, Colorado that forcibly held Japanese Americans from 1942-1945. Additional online exhibits and badges investigate African American history in Colorado, international trade during the fur trade era, and the Ute people of Colorado. The fifth and final online exhibit and badge in this current series is El Movimiento, which explores the Chicano movement in Colorado, and is scheduled to launch in March of 2016.

Digital Badge Audience

History Colorado’s online exhibits and digital badge initiatives are free for anyone to explore, but are specifically designed for classroom teachers and students, and align with formal curriculum and state standards. Each online exhibit is based on themes suggested by classroom teachers. Teachers in 3rd and 4th grade classrooms draw on the program to reinforce social studies content and help prepare students for standardized testing. It is also used among 7th-8th graders studying U.S. History, and by high school students enrolled in U.S. and World History courses. Younger students tend to explore the exhibits and earn badges during class time, while older students may participate as part of a homework assignment or introduction of a theme, such as migration, or the

global economy. Douglas is especially interested in engaging 3rd and 4th graders, as she feels that if a student is introduced to digital learning tools at a young age, they will continue to utilize them throughout their education.

While some teachers are introduced to the project by attending a professional development workshop with Douglas, most use the site without direct assistance from the museum. The program is promoted in a monthly teacher e-newsletter that is distributed to over 3,000 teachers throughout the state. Throughout the school year, up to 400 new teachers log into the digital badging platform each month. Once logged in, they can review the progress of each student in their classroom. As they prepare lesson plans, teachers can preview badges and access supplemental teaching resources that correspond to the content presented within each online exhibit and badge.

Figure 29 Sample of a Teacher's Management Page. *Source:* History Colorado.

The screenshot displays the 'History Colorado Online Exhibit Badges' management interface. The top navigation bar includes the History Colorado logo, a 'CLICK TO START!' button, and links for 'BACK TO ONLINE EXHIBIT', 'MY BADGES', and 'SAVE & LOGOUT'. The main content area is titled 'Welcome Laura' and lists ten students (G 33 through P 33). Each student row shows their name, a small profile icon, a date, a badge icon, and two action buttons (edit and delete). The sidebar on the left contains navigation links: 'Manage Students', 'Preview Badges', and 'Account Settings'. Below these links are buttons for 'We Issue' and 'OpenBadges', and a 'SAVE PROGRESS & LOGOUT' button. A legend indicates three badge levels: 'Plains Level - Easy' (green), 'Foothills Level - Medium' (orange), and '14ers - Difficult' (blue).

Student	Icon	Date	Badge	Edit	Delete
Student G 33	[Icon]	5/27/2014	[Green]	[Pencil]	[X]
Student H 33	[Icon]	7/8/2014	[Orange]	[Pencil]	[X]
Student I 33	[Icon]	5/27/2014	[Orange]	[Pencil]	[X]
Student J 33	[Icon]	5/27/2014	[Green]	[Pencil]	[X]
Student K 33	[Icon]	6/2/2014		[Pencil]	[X]
Student L 33	[Icon]			[Pencil]	[X]
Student M 33	[Icon]			[Pencil]	[X]
Student N 33	[Icon]	5/27/2014	[Green]	[Pencil]	[X]
Student O 33	[Icon]	5/27/2014	[Orange]	[Pencil]	[X]
Student P 33	[Icon]	5/27/2014	[Orange]	[Pencil]	[X]

The Basics

Douglas further describes the program's two components:

The online exhibit is actually the cool stuff, the stuff that twinkles and tells stories, has pop-ups and videos. The badging is not super exciting, it's just the quiz. There's multiple choice, timeline activities, drag and drops that have to do with primary sources, packing a suitcase . . . None of the quiz is earth-shattering, it's the online exhibit. Kids love this! It talks to them in the way they like to be talked to, and in the way they like to learn. It's not too cumbersome or overwhelming. The information is offered in small little nuggets. None of the video clips within our website are over a minute and a half long.

The online exhibits and badges are primarily used independently within classrooms, rather than in conjunction with a museum visit. Some are based on the museum's onsite galleries, while others include stories, interactives, and digital collections that can only be explored online.

Figure 30 Sample Online Exhibit Main Page. *Source:* History Colorado.



However, several are based on exhibits at the museum, and may be valuable pre- or post-visit material. Douglas is finding that more onsite school groups are exploring the content in advance of a trip to the museum:

I've been giving a school group tour and a teacher has said, 'Oh yes, we saw this online' and I have been surprised and curious to know how they learned about the site. It's such a new project, so the fact that people are finding these resources, and know how to navigate from our History Colorado website to these digital badges is very exciting!

The museum now places promotional postcards outside of all the onsite exhibits that have an accompanying online exhibit and digital badge including:

Confined Citizens: The Amache-Granada Relocation Center, 1942–1945

Mountain Haven: Lincoln Hills, 1925–1965

Convergence: Bent's Fort, 1833–1849

Douglas provides an example of how these onsite galleries are virtually reproduced:

Our "Confined Citizens" exhibit includes a reproduction of the barracks that prisoners in the Amache Internment camp were forced to live in. Our online exhibit is based on a 360-degree photo of that barrack. Now visitors can say "oh, I can learn more online" but up until very recently, we didn't have that happening. Most people were finding the online exhibit through word of mouth, or our e-blasts.

The online platform is accessible from all kinds of devices, but most classroom teachers use Chromebooks. The museum purposely chose not to use Adobe Flash Player, because it is not available on all mobile devices or web browsers.

Figure 31 Sample Badge Icons. Source: History Colorado.



Badge Earning Process

Douglass finds that 3rd and 4th grade teachers often dedicate an hour to an hour and a half out of their class time studying an online exhibit. Most often, teachers will project the exhibit website on a whiteboard or Promethean board so that students can follow along. Douglas spends a lot of time visiting classrooms and describes how she presents the content:

I will do a 5-10 minute overview of the day's lesson . . . Then, as a class, we'll watch the intro video to the related online exhibit up on the Promethean board. Then I'll say, "Okay class, I want you to explore button one." At their own computers, students then go into the exhibit and click around through the button one content. I'll walk around the room to make sure that they're staying on task- clicking on material, watching videos, flipping through images, reading. . . .When they start getting restless, I call the group back together, ask if there are any questions, and seek reactions for a few minutes. Then I ask the class to explore the second button.

This process continues until students have explored every button, or content area within a digital exhibit. On average, 3rd and 4th graders will complete this activity in 30-40 minutes. Next, students complete a quiz that reinforces the content presented within the online exhibit. Similar to a game, the quizzes are a series of activities that provide students with a fun way to test their knowledge, while also earning a digital badge. Throughout the quiz, students can return to the online exhibit to review the material. Douglas finds that it is useful to have students complete the quiz in sections, to allow a

teacher to monitor the progress of each student and see that no one is left behind.

Teachers can assign students to different levels of badges based on their learning styles and abilities. Students are also able to progress through the levels to earn multiple badges within a single module. Most students will complete the quiz in 15-20 minutes. As Douglas explains how the digital badge quizzes are divided into three levels of difficulty:

The levels are Plains, Foothills and 14ers. We purposely used these titles so that the kids aren't as aware of the levels. Now, it is a mountain, and most users figure out that the higher you go up, the more difficult the badges are, but we don't say, 'you kids are smarter than those other kids.' The teacher will assign different badges for a mixed level classroom and I can go into the system and see what badges students have earned.

Figure 32 Timeline Activity within a Digital Badge Quiz. *Source:* History Colorado.



Goals of Badges

First and foremost, this initiative aims to place Colorado history into the hands of students and provide educators with supplemental teaching resources. Douglas explains the particular value this program offers teachers in the Colorado public school system:

For the past decade, social studies education has been losing ground as subjects that are assessed--reading, writing and math--are taught at the expense of subjects that are not assessed. New standards were passed in recent years. In the spring of 2014, Social Studies content was integrated into standardized tests taken by 4th, 7th, and 12th graders. In many cases, teachers have not taught social studies in years, except as an elective, and they need resources.

In the summer of 2015, the museum developed lesson plans and annotated resources to accompany each online exhibit. These resources are available at two learning levels: 3-4th grade and 7-8th grade. Each lesson plan includes a daily agenda of activities and information that guides teachers in how to explore and present Colorado's unique history through the museum's online exhibits. The annotated resource sets include primary sources with links and suggestions for how they can be incorporated into a lesson.

In many cases, students learn elements of state history that are not included in mainstream textbooks. Many of these stories address issues of inequality, and Douglas describes the intended response from students:

I want them to say "that's not fair." All of these stories are about "that's not fair." Japanese internment- that's not fair, they took them from their homes? This is a third grader. How is that fair?! They're US citizens! African Americans—people being moved off their land, that's not fair, how do we make that never ever happen again? It's happening all the time and we racial profile, we see churches being burned down in South Carolina, that's not fair. I'd love kids to make that connection, "that's not fair, how that can possibly happen?" For me personally, it's all about social justice. Institutionally, the goal is to tell stories and to learn from

our past, it's the general why do we study history? It's to not make those same mistakes again.

Audience Feedback

From conception to implementation, History Colorado's online exhibits and badge creation is an iterative process that is informed by educator and student feedback.

Douglas notes:

Since 2013, we've done three rounds of focus groups- one before we started the process, one when we just finished the first online exhibit and another when we finished up the second exhibit. We've gone into four different communities in the state to solicit feedback from a diverse representation of Colorado students. We tested with some of the same kids throughout each stage, which allowed them to really see the impact their feedback has had on the project. We've heard them say, "Wow, you really listened to what I was saying!" so some of those kids we've seen 3 times.

At the end of the current funding cycle, the museum will seek the input of this group once again. In addition to soliciting feedback about the exhibit and badge content, the museum has also inquired about what motivates participation. From the teacher's point of view, the program offers them high-quality, interactive resources for teaching Social Studies.

Douglas describes a common reaction provided by 3rd and 4th graders:

Students often tell us that 'my teacher made me do it, but most students also say 'It was really cool, I'm glad I did...once the kids get into the system, I'll see these rogue kids who are completing badges beyond what has been assigned by their teacher. To me, that indicates that they are really excited about the online exhibits and badges.

Seeing that the badges function as a quiz, and most earners complete the quizzes alongside their peers, the program does offer an element of gamification. Through their ongoing evaluation process, History Colorado has collected feedback from both students and teachers about badge motivations and have worked to design a mechanism for badge

earning that does not hinder a student's capacity to be intrinsically motivated. Douglas explains:

We thought at first we'd be looking at gamification, because kids like to compete- we were going to time how long it takes students to complete their badge, but then you get into situations where students just answer the question without reading it... The teachers have found that kids just being able to complete badges and compare with their classmates, "I've completed two, have many have you?" is enough competition or gamification for what our teachers are looking for. They aren't saying this is too much or too little game. Fortunately and unfortunately we're not having to deal with the pros and cons of gamification. Using computers is enough of a carrot for the 3rd and 4th graders.

The Challenge of Assessment

As described, in order to earn a digital badge, a user must complete a quiz. These quizzes are automated, which somewhat restricts the type of questions that can be asked, and the way a student's comprehension of the exhibit content can be assessed. Douglas explains the reasoning behind this design, and some of its limitations:

It's automated. Our teachers really want a reading prompt, and really wanted their students to have to write something. We thought about enabling the teachers to log in and grade student writing, but the web design that would be required wasn't financially viable on our end.

This feature may be achieved by instructing the system to search the response for keywords. For instance, if a student's response to a written response question in the Tribal Paths quiz included the terms, 'bear dance,' 'pow-wow,' 'red mountain,' and 'chimney rock,' they would be correct. Presently, a badging platform that would require approvals to be completed manually by the museum staff is not feasible. Douglas describes the challenge:

We don't have time to go in and manually review every badge earner's work. We're now getting thousands of viewers a month, even in the

summer. . . . It is nearly impossible to have any kind of writing prompt. There has to be a list of options rather than an open response, because the answers are automatically reviewed by the system. It's a bummer. Someday.

Figure 33 Sample Multiple Choice Question in a Digital Badge Quiz. *Source:* History Colorado.



In the future, Douglas hopes the project will include written response that students could submit to their teacher for review and approval. Currently however, the badging platform automatically manages the earning process and does not track incorrect or multiple attempts. If a user selects the wrong multiple choice response, they are told are incorrect, but are able to continue guessing; the badging platform only tracks when a correct answer is selected. Ultimately, if a participant completes all the quiz questions, they earn the badge. Douglas concedes that this is not an ideal design, if one is focused on learning assessment:

That is [tracking incorrect responses] one of the things we wish we could do, but decided ultimately, the goal was to have students finish the badge and have success. We thought about not ever giving them the right answer, they'd have to go back to the actual online exhibit and look for the answer before they could move forward in the quiz, but ultimately decided if they keep clicking, they'll eventually get the right answer. If they want to cheat the system, they'll figure out how to do so.

Participation, on the other hand, can be more easily measured. Google Analytics track page views and online activity, that provides the museum with basic data about their online visitors and badge earners. For instance, during the month of September 2015, the online exhibits webpage was visited 3,963 times, 1,042 online users began the process of earning a badge, and 742 badges were completed.

Unique Strength: Making the Museum Visit Accessible

While an unintended purpose, teacher feedback has indicated that the online exhibits can also be a meaningful pre-visit tool. In particular, online exploration of the exhibits and badges may help better prepare students with developmental differences or physical disabilities for their museum visit. Douglas shared a recent case:

Last week I had a Special Education teacher from Boulder Valley School District say to me, I really love your Amache exhibit because I work with students that have serious sensory challenges. When they walk into a museum they'll be completely overwhelmed by lights, sounds, big entryways. But if they can go onto the online exhibit and see a preview of exactly what they're going to see. The Amache online exhibit has a 360 degree video of the barracks we have at the museum, so they're using it to prepare their students for what they're going to see. This also allows the students to make connections during their museum exhibit. This wasn't something that had ever occurred to me until I heard from that teacher.

Funding & Partnerships

This program is funded through a grant from The Institute of Museum and Library Services. History Colorado initially requested an 18-month grant and intended to develop 5 online exhibits, 5 badges and build the entire badging platform within this time period, but has received an extension in order to complete the first series of 5 exhibits and badges. According to IMLS, the funding will conclude in March 2016, but Douglas anticipates the project will be finished by October 2016.

The project also receives funding from BP, which was initially solicited to support a larger initiative that seeks to distribute comprehensive history resources within 50 miles of every young Coloradan. So far, that project has provided history tool kits to 27 museums and libraries across the state. As Douglas suggests, the museum's digital badge projects are a continuation of this goal:

Now with the online exhibits, we can easily be 50 miles from every student, we can be one foot from every student...3 students for every computer was our original goal. A lot of schools are now 1:1 or 1:2. Across the state, most students are at a minimum 3:1.

Other partners include eNetLearning (eNet), and the Board of Science Education (BOSE). eNet works with small rural school districts, and the museum has budgeted some marketing dollars so that as eNet leads professional development trainings where it introduces the concept of digital badges and History Colorado's specific program. The museum has also presented this project at several local, regional, and state conferences for a variety of audiences, including teachers, museums, and libraries. Douglas is enthusiastic about sharing their knowledge and resources with others:

I have a dream of putting all the digital badges from museums across the state onto our website. We have a template and have talked a bit about

what it would take to get the permissions. Our website guy thinks it would be fairly easy now that we've established our template, and we've created 4 badges. What our top museum administrators say is let's finish the 5 badges that we have our funding for, and the two more that we have potential funding for, and really get our feet wet and become experts. Then we'll talk about adding other people.

Some of the institutions Douglas hopes engage in future partnerships are the Telluride Museum, Golden Pioneer Museum, and The Buffalo Bill Museum.

The fact that we spent \$50,000 developing the database and backend of this project, we would love to have other institutions avoid the cost and time because we already did. We'd love to share it with them... There are 5-6 museums that have come to us expressing interest and 2-3 that are pretty serious and committed to the idea, whether they partner with us or embark on their own project. I say, 'No we want you do it on our platform,' as it would really benefit us to manage all of the badges. I call it my Colorado Backpack.

Suggestions for the Field

Douglas has many suggestions for institutions that might be considering digital badging.

- Look at what you can buy out of the box. See if you can get the database piece. That was long, hard, and expensive to do in-house.
- Do a tremendous amount of front-end evaluation, including surveys and focus groups. Be clear about the wants and needs of your audience.
- It's okay to change your themes later, but formatting changes are more difficult to modify. Once you've committed to a format, stick to it.
- Don't use too many words in your online exhibits or badging activities. Embed PDFs.
- Figure out your terminology and the purpose of the badge.
- Make sure that there is a tight line between your museum educators, developer, and designers and grant writers. Be sure that you're not making promises in your grant proposals that you cannot keep.

Douglas also offers some advice for those considering digital badge programs designed specifically for classroom implementation:

- If working with school districts, identify what websites and plug-ins they block in their classrooms, such as Youtube, Vimeo or iTunes, and provide an alternate way for teachers to present this content, such as on CD.
- If students are struggling to understand the content, take the conversation offline. Sketch out the problem by creating a matrix. Do it on the board with the whole class.
- Teachers that aren't super tech-savvy should ask their students for assistance. Most students are digital natives and are very familiar with how these tools work.

What's Next

As previously noted, Douglas is passionate about the potential for digital badges to address socio-cultural issues related to opportunity and access. She hopes that more museums will begin implementing them.

My vision for a Colorado Backpack is, 'Wouldn't it be awesome if a lot of museums could teach this way?' Because a lot of people can't go to museums, either because of financial barriers, distance and transportation, there are a lot of reasons. The more you can put on online...our attendance is never going to go down because of our online exhibits.

History Colorado staff is currently raising funds for the next three online exhibits and digital badges.

For more information about History Colorado's online exhibits and to begin earning your own digital badges, visit:

<http://www.historycolorado.org/educators/online-exhibits-digital-badges>



Institution: Denver Art Museum

Location: Denver, Colorado

Annual Budget: \$27 million

Staff Size: 218 full-time & 180 part-time

Annual Attendance: 685,000

Project Name: Rover Mobile Website

Badge Earner Audience: General Admission Visitors*

Location of Use: Onsite

Interviewees: Michelle Lim, Digital Engagement Programs Assistant

Melora McDermott-Lewis, Chief Learning Engagement Officer

Matt Popke, Developer

Project Impetus

The Denver Art Museum's digital badge project is one piece of a larger multi-institutional partnership that was spearheaded by the Dallas Museum of Art. In 2012, the Dallas Museum of Art received a large technology grant that enabled them to build a digital lab. One of the first projects they embarked on was *DMA Friends*, a digital platform for issuing badges and rewards.⁸⁶ Enthusiastic about its initial success, leaders of the project were eager to see if and how other museums might benefit from digital badging. DMA secured a multi-institutional grant from the Institute of Museum and Library Services and approached other museums to participate, including the Denver Art Museum. Thus, began the envisioning of *Rover*, a museum visitor's best friend.

⁸⁶ For additional information about *DMA Friends*, refer to pages 18-19.

* Museum visitors do not technically "earn" badges in this model. Instead, as this case study will explain, badging technology has been built within the Rover mobile website that generates recommendations of in-gallery activities for visitors, based on their personal interests.

Previous to developing *Rover*, the museum had not experimented with digital badging, and there had not been many internal conversations around this type of digital strategy. As Developer Matt Popke recalls,

Badging and gamification in general is something that wasn't really on our radar until *Friends* happened. Then there were some conversations about what they were doing and what it amounted to, but until the grant I don't think there were too many people who were really too interested in it.

Melora McDermott-Lewis, Chief Learning Engagement Officer further describes the museum's intentions for developing a digital badging program:

I don't think we went into this saying we wanted to experiment with badges. I think we had this opportunity, we had a real need and we said, when you have family in town, we walk you through the galleries and point out a specific works of art, and we thought, 'how can we have that personal recommender in this form?' I think that was motivating it and badges happened to be a vehicle that would allow us to do this versus, 'we have to use badges.'

The Basics

Designed to be used during a museum visit, *Rover* is a mobile website that connects visitors to the museum's permanent collection, special exhibits and family programming spaces. Users can connect to the website through the museum's public wireless network using a personal mobile device. While the museum does not currently offer loaner devices for visitors, they do ask visitors to notify the museum if

they wish to use *Rover* and do not have access to a device, in the hopes that this information will help to build the case for loaning devices in the future.

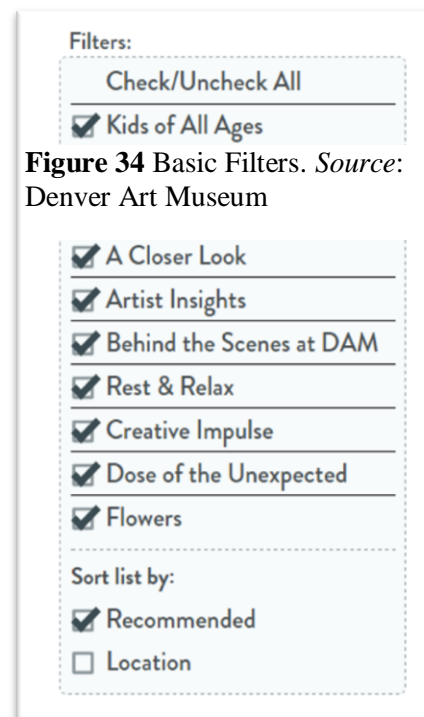


Figure 34 Basic Filters. *Source:* Denver Art Museum

Digital Badging Platform

Rover's basic badging platform was designed by developers at the Dallas Museum of Art for the *DMA Friends* program. However, the partner institutions utilizing this platform through shared IMLS funding have been encouraged to modify the technology to meet their unique needs and interests.⁸⁷ While badge issuance is built into the platform, the Denver Art Museum is utilizing the badging technology in an alternate way; as an internal mechanism for categorizing activities ranked by visitors. The digital badge platform imbedded within *Rover* enables users to filter and sort activities based on a series of categories. In addition to filters, activities are also sorted by badges, which provide a way for the museum to internally tag or code the natural clusters of activities that reflect visitors' interests. DAM initially developed 10 badges based on patterns they expected to see. Now that *Rover* has launched, they are beginning to track user's natural affinities and create more badges based on those common themes. As Lim explains:

The badge names are very straight-forward because no one will see them except for us. There's one for every collection; Painting and Sculpture, New World, Asian, American Indian, etcetera. If *Rover* starts picking up that someone is really interested in the American Indian collection, it will keep giving them activities and objects from that collection. Then the non-collection badges are titled Hands-on, Live Program; we're also experimenting with Spanish, and ones that encourage you to take photos.

Badge "Earning" Process

One unique feature of DAM's project is the functionality of digital badges. Badges serve an internal purpose and while they are closely tied to user response, users

⁸⁷ For additional information about *DMA Friends*, refer to pages 18-19.

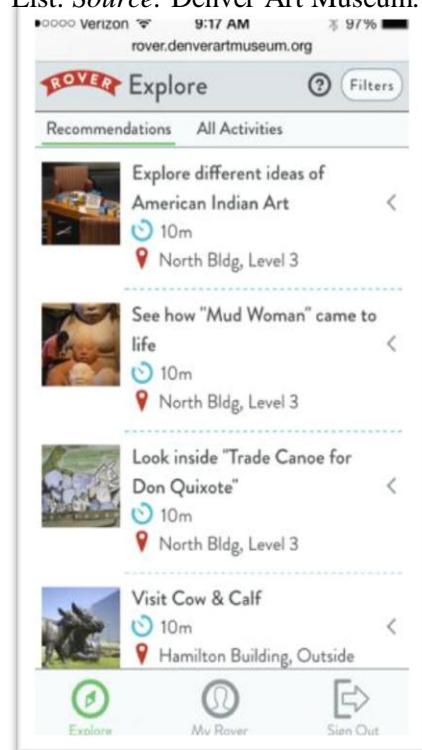
are not technically “earning” badges. By filtering, rating and selecting activities in *Rover*, users provide data that links back to the badge clusters. Lim describes this process:

Filters do low-level sorting. They’re the more gross sorting mechanism that you can actually control, and the badges offer a higher level of recommendation. In the way that you would create a group of activities that would get you a certain type of reward, we have badges set up so that there are groups of activities of a certain kind, so hands-on, or hands-off, collection-based...and as you complete multiple activities related to one of those badges, you’ll receive recommendations for the other activities within those badges. When you say you’ve done something, *Rover* will ask you if you want to fetch a new list... you need to teach *Rover* how to help you, by telling it what you like, so it’s kind of like you’re training *Rover* to feed you good recommendations.

Each time a visitor rates an activity in *Rover*, the “badges,” or collections of activities that most closely align the visitor’s perceived interests, will be updated to their personal *Rover* account. These appear in the form of personalized recommendations. The *DMA Friends* badging platform also is capable of issuing rewards for earning badges, however the Denver Art Museum staff is not particularly interested in utilizing this feature. Popke explains the rationale behind this decision:

We expressly avoided that, at least initially. The infrastructure for providing those benefits is built into the system whether we use it or not, so we may change our minds, but we really wanted to see if we could provide an intrinsic reward to the user that would motivate them as strongly as free parking or something, or whatever- the things that Dallas does. We really wanted to have an intrinsic reward rather than an extrinsic reward and we’ll see if that works

Figure 35 Sample Recommendation List. *Source:* Denver Art Museum.



as well as we hope it does. I think it can, it's just a matter of what the data tells us after we start collecting it.

Goals of Badges

While *Rover* utilizes the *DMA Friends* badging platform, as previously discussed, DAM's approach does not include a focus on earning badges or rewards. A primary goal of *Rover* is to help visitors navigate the museum's spaces, and find activities, artwork, and events that interest them. One of the museum's longstanding problems articulated by the DAM staff is sharing information about the museum's exhibits, programs, and special offerings in a way that is manageable, efficient, and personally relevant to visitors. DAM hopes that *Rover* will be a solution to this problem. By using *Rover*, a visitor can receive up-to the minute information about what activities, programs or exhibitions are happening during their visit to the museum.

Rover can also serve as a wayfinding tool. Attempting to locate an activity in one of the museum's two buildings and across 11 floors can be challenging, even with the assistance of maps. Every item within *Rover* includes a narrative description. In addition to detailing the activity or artwork, the DMA seeks to include language that will help a user navigate to the space within the museum and be able to recognize when they have arrived at their destination.

Audience Feedback

Prior to its public launch, DAM sent out an institution-wide email asking staff to use *Rover* and submit feedback. The museum also created a structured evaluation with the 10 summer interns who tested *Rover*. Lim added, "They were a particularly good group to work with because some of them had never been to the museum before and provided fresh eyes." Some of the earliest feedback expressed a desire to build and save

an itinerary, as well as adding content that can be linked to existing videos. The pre-testing audience also wanted to be able to save items into their own online collections. Since *Rover*'s launch in July 2015, the museum has experimented by sending out an electronic survey 24 hours after a user registers for *Rover*. While the survey has solicited few responses, users have expressed a desire for more interpretative content and information about objects. The museum's long-term strategy for gathering user-feedback is still in development.

Initial Challenge: Assessing Engagement

One early challenge the *Rover* team faced was developing a way to rate or weigh activities within the back-end of the recommendation tool. The team established a 1-3-5 scale that weighed *Rover*'s activities based on the level of engagement. The rating considers how much effort and time an activity may require, as well as if the activity occurs at a scheduled time. The activities with the highest engagement ratings are displayed at the top of the webpage. These might include time-sensitive or effort-filled activities that a user might first want to consider, to help structure his or her museum visit. A tour that begins in five minutes, for instance, will appear at the top of the list. Activities or exhibits that can be viewed at any time appear further down the recommendation list. McDermott-Lewis elaborates on the complexities of ranking engagement:

What I think was most challenging at first was assigning values to levels of engagement without implying anything in those values. We didn't want to say, 'you're much more engaged if you do x rather than y.' It really had to do with the amount of effort required. In some early conversations where we talked more generically about badges, people would say, 'well if people commit to doing x, that's obviously a much deeper experience than y . . . 'and some educators would respond, 'no, actually a five minute

experience can be as profound as a much longer activity. . . ' it was about finding our definition of engagement.

Unique Strength: Customizing the Museum Experience

DAM has made very deliberate choices in the activities and artwork that *Rover* will recommend in the hope that users will discover engaging, personalized content that results in a more satisfying museum visit. As McDermott-Lewis explains, *Rover* may be able to provide supplemental content that enriches items already in the collection.

We don't just send you to an artwork that has a tombstone label...we have some objects where we've developed content in the past that currently are not in the galleries and now we're asking, if we use *Rover* to imbed a video related to this piece, will it then become a satisfying stop?

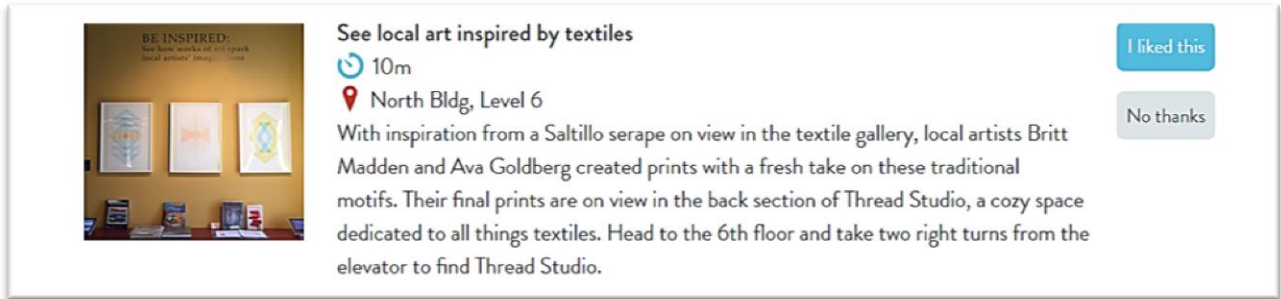
In some ways, the staff feels *Rover* can serve as an institutional index of its collections and programs. As Popke asserts, "I think it's important to reiterate that *Rover* is not intended to be the primary content, it's the tool that gets you to the content." "And it's providing you just enough information to make you want to find out more," Lim adds.

McDermott-Lewis describes the process of selecting content to be included within *Rover*:

We have really rich content in our galleries at this point. As we were trying to come up with the first 120 activities, it was not that hard. You walk through our galleries and okay, there are 10 things on this floor you can do. The content is there, it's getting people to be aware of the content and make use of it. And I think both a heartening thing and a disheartening thing is the number of staff and volunteers who prototyped and came back saying, 'I never knew that was there, I never knew you had this' and I thought, 'Oh dear.'

Each description is intended to guide a user to a particular activity or work of art.

Figure 36 Sample Activity Description. *Source:* Denver Art Museum.



Upon arrival, the description may provide a prompt, or reflection, or direct a user to a hands-on activity. In this way, *Rover* may also function as a tool for interpretation and meaning-making. This written element is very different from official communications materials or in-gallery interpretative materials (see Figure 36). As Lim explains, “It’s a lot more flexible because *Rover* is meant to be a casual museum buddy, someone who is taking you around, a familiar voice, or friend. We’ve been able to play with the language and use wording that traditional interpretive panels wouldn’t include.” Because *Rover* is still in an iterative stage, the museum is unsure whether *Rover* will function primarily as an interpretative tool or an itinerary building tool, but in either case, it helps create a more personalized museum experience.

Funding & Partnerships

Funded through an Institute of Museum and Library Services (IMLS) Leadership grant, *Rover* is one of five institutions exploring digital badging through Dallas Museum of Art’s *DMA Friends* badging platform. Other grantees include the Los Angeles County Museum of Art (LACMA), Minneapolis Institute of Art, and The Grace Museum in Abilene, TX. Leaders of the *DMA Friends* project helped to secure the initial IMLS

funding, and selected partners based on a number of factors, such as their history of experimenting with technology.

Initially a two-year grant, the IMLS funding has been extended for an additional year. This extension will compensate for some delays caused by technical issues that required some redesign of *DMA Friends* badge platform before it could be deployed to the partnering institutions. The DMA doesn't expect to use the full third year of funding; the extension will allow for *Rover* to be fine-tuned during its first few months of operation.

The grant was specifically designed to allow the grantees to approach digital badging in a unique way, while making use of shared technology. As McDermott-Lewis notes, "Learning from each other while developing institutional capacity is actually something I think IMLS Leadership grants are interested in." Looking ahead, the museum is optimistic that the project will be sustainable after the funding cycle. "Our hope is that it is sustainable and a good product," McDermott-Lewis states. "We're beginning to have conversations about if things go the way they go, I think there are additional things we want to do. Do we seek additional funding to do this? What does it look like?"

Recommendations for the Museum Field

The Denver Art Museum staff has several recommendations for institutions that may wish to explore digital badging. First, they stress the importance of considering audience motivations. Popke suggests, "Really, really think about the motivations your visitors already have and start there. Instead of trying to nudge them into a different set of motivations, try to appeal to those motivations and provide whatever it is they need to achieve those goals." Rather than offer "best practices" McDermott-Lewis suggests that

museums view the process of implementing digital badging, as well as any new initiative, as an opportunity to prototype, iterate, and study user response:

Best Practices is an old way of assuming that there's a stasis in the world. The conditions are continuing to change, so the notion of best practices can actually be very limiting. In our complex world, it's more about looking and seeing what's happening, responding to what's happening, and continuing...I think this project is much more of an evolutionary, developmental approach.

"The best best practice is really observation," Popke adds.

What's Next

While *Rover* is primarily being used by adults, DAM is already discussing how *Rover* can engage other audiences. Lim notes "There's an interest in using *Rover* for high school self-guided tours, though there is still a question of whether that would be individual students using *Rover* on their own smart phones or if there is a guide who is using *Rover* to take a group around." The museum plans to experiment with high school self-guides in the fall of 2015. While much of *Rover*'s early promotional content was presented to visitors during a museum visit, the staff is currently examining the efficacy of onsite and online promotions that will ultimately inform their long-term marketing plan.

Looking ahead, the museum does foresee adding additional content that will enhance *Rover*'s ability to serve as an interpretative tool. For the time being, however, it is being promoted as a discovery and wayfinding tool. *Rover* remains an evolutionary project. As McDermott-Lewis confirms, "it's very much an iterative, let's play it out, let's get some feedback, let's talk to Matt [Popke]."

For more information about *Rover*, visit: <http://Rover.denverartmuseum.org/>



Institution: The Frick Art and Historical Center

Location: Pittsburgh, PA

Annual Budget: \$5 Million

Staff Size: Approximately 35 full-time & 100 part-time

Annual Attendance: 120,000

Interviewee: Laura Beattie, Associate Curator of Education

Impetus for Interview

Laura Beattie is an Associate Curator of Education at the Frick Art and Historical Center in Pittsburgh, PA. She completed this researcher's online survey and based on her responses and expressed interest in sharing more, she was contacted for a follow-up phone interview.

Beattie was introduced to the concept of digital badging through STEM and STEAM-focused educational events throughout Pittsburgh. Most of the conversations about digital badging at the Frick have occurred within the museum's education department, and have been in response to Beattie's participation in city-wide workshops and events. Some of Beattie's concerns about digital badges have been reinforced through her own experience as a badge earner. She describes one particular experience:

It's funny; a week after attending a badge-related event, I received an email from the event organizers that I had earned 2 badges. I felt that that was a perfect example of my concern. They had no idea what my engagement was, or what I took away from the event, and suddenly I had two badges.

Although Beattie knew that the event leaders wanted to demonstrate how badges could be used as an engagement tool, she felt she could have slipped through the entire conference, and not learned or participated in anything and still earned the badges. In addition to this

experience as an “earner,” Beattie has had opportunities to learn more about the challenges and strengths of badging from the perspectives of current and potential issuing institutions. She elaborates:

There was one Ted Talk event last winter that was attended by a lot of teachers and high school students and cultural institutions. In addition to presentations of case studies, the event included roundtable activities about attitudes regarding badges, and badge implementation. Participants broke out into committees to discuss badges focused on specific skills, such as business and financial literacy, or basic robotics. At the end of the event, each committee had the skills they associated with their proposed badge laid out on tables for review. All of the event participants were asked to walk around and critique and comment on post-its, and talk to the committee members at each table. I kept thinking ‘how are we going to measure this? That an earner has developed this skill?’ Some seemed so nebulous to measure, while others seemed clear. I could see how one could measure that a learner had developed skills to program a robot to complete a specific task, but other badges worried me because they were so vague.

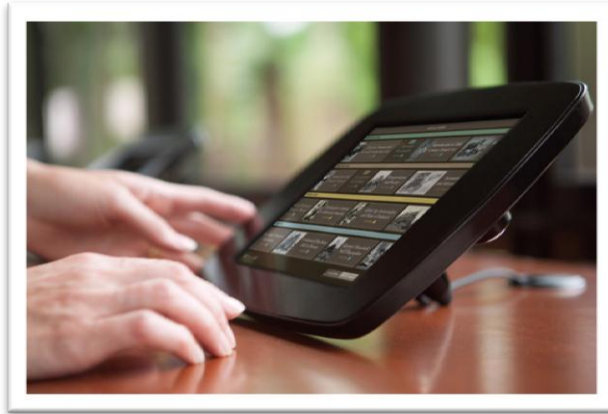
While uncertain about the efficacy of badges, Beattie was pleased to participate in an event that encouraged collaborative thinking and embraced an open critique.

Digital Engagement at the Frick

Recently, the Frick has found a way to develop new digital tools to achieve its goals and address challenges. The central focus of this work is a new visitor orientation center, which opened in 2014. Through the integration of interactive technology, the museum seeks to create new opportunities for visitors to learn and explore. Because of its 5 ½ acre campus and varied collections, an ongoing challenge has been to help visitors to identify and navigate the offerings of this unique site, which include: Clayton Historic House, the Frick Art Museum, Car & Carriage Museum, The Café, Playhouse, Greenhouse, Education Center, and Administrative Offices. Rather than attempting to

spread new technology throughout the site's multiple buildings, the museum made a deliberate decision to integrate its digitally interactive experiences within the orientation space.

The first point of orientation is the Multi-Plex, a series of screens with rotating information. This passive experience introduces visitors to the day's activities, special exhibitions, ticketing and membership information, and other details that might be relevant to their visit. A Touch Table station highlights some



of the Frick's collections, and invites visitors to click and explore content based on themes such as portraits and personalities, and the natural world. This interactive is designed to be a social experience, where multiple visitors can explore interpretive content together. The iPad Bar is an onsite application that includes a Storyview function, where visitors can explore primary resources about the Frick family, collections, local Pittsburgh, and national history. Designed for individual use, the Tablet Bar is ideal for visitors who want to dedicate time to delving deeper into a specific topic. The final component is an interactive campus map. In addition to serving as wayfinding tool, the map includes text that provides an introduction to each building and its relevance to the site.

Figure 38 Interactive Campus Map. *Source:* Belle & Wissell Co.



To execute this ambitious project, the Frick sought the expertise of architectural and interactive design firms, Schwartz/Silver Architects and Belle & Wissell Co. Because the museum does not have internal IT staff, it worked with these partners to develop digital tools that could be easily managed by the Frick staff. The goal was to create flexible, thoughtful digital components that can be adapted and expanded in the future. The capacity to eventually access these digital tools offsite is already built into the system.

While it remains unclear if digital badges will ever be a part of their efforts, Beattie identifies one possible way badges could be integrated into an engagement strategy:

Several of our community partnerships do involve monthly visits to the museum. Participants explore a different part of the collections each month. It's a literacy-based initiative and we've been thinking about how to measure their reading and writing when we only spend a few hours with them each month, but perhaps a badge might be a way to follow up between the visits.

Perceived Challenges: Standardization & Accountability

While badge advocates often promote the notion of standardization, Beattie is uncertain about the feasibility of developing standards that could be shared across multiple institutions. She explains:

I think the main challenge would be transferability, but the personal accountability might be more strong if a person had to do x, y, and z and know a, b, c in order to earn a badge at the Frick. There would be more control . . . but would that transfer to the Carnegie Museums?⁸⁸ Would they agree that the standards were the same?

Despite her misgivings, Beattie is open to exploring the possibilities of standardization:

Maybe institutions in Pittsburgh are talking about shared standards, but I haven't been a part of those conversations. After you develop those shared badge concepts, what are you doing at your institution to really address them? I think there's a trust level that I could have, but don't think I have yet. If another museum approached me and said, "We're working on this badge at the Warhol Museum. Are you interested in seeing how it matches or complements what you do?" I think we'd explore it. It just hasn't happened yet. The discussions about badging have been at a more general level, there hasn't been that one-on-one outreach between museums yet. Still, I think we'd definitely be open to that.

Several institutions that do not plan to implement a badge program on their own still express some interest in a multi-institutional approach. Similar to her concerns regarding standardization, Beattie is also uncertain of how the validity and integrity of badges can function in a multi-institutional model, and how partners might insure accountability. She elaborates:

In some ways, we accept the validity of outside institutions all the time. We accept that a person with a college degree has learned x, y, and z, or

⁸⁸ The Carnegie Museums of Pittsburgh is a collection of four institutions: Carnegie Museum of Art, Carnegie Museum of Natural History, Carnegie Science Center, and The Andy Warhol Museum.

close enough to it. I guess it would take interaction between the people at the institutions, to discuss the collections, the hands-on programs that might be involved, laying out themes you would expect to cover, and approaches. I can see it working out, but think it would take a lot of institutional interaction.

Perceived Strength: City-wide Collaborations

Some of the more recent meetings and workshops Beattie has attended have been connected to the Pittsburgh City of Learning initiative. However, until this interview, she has not been aware of the program's growth. She explains:

There are a lot of places participating. In fact I just went online to see who all were using badges and was surprised by how many institutions are participating. It's scattered throughout both big and small institutions, and is more widespread than I realized. Pittsburgh City of Learning has gone out of their way to promote things. They have tool kits on their website for other cities . . . but obviously they're not reaching everybody. I haven't totally bought into it, but they lay out all of the information clearly. I appreciate that they present multiple perspectives in their materials, by sharing the bumps and challenges and highlighting prominent educators who are skeptics. Through this conversation I'm realizing that it's about the interpersonal component. Reaching out to another museum that is interested in the same type of badging program and goals could be a way to build that trust and accountability.

Funding & Feasibility

As a survey respondent, Beattie noted that internal and external funding were not major challenges to implementing badges at the Frick. Revisiting this issue in a follow-up conversation, she also acknowledged her limited familiarity with what financial commitments digital badge technology may require. Beattie added:

I was thinking that we could integrate it into what we do anyway . . . it could require more staff time to plan and track, but at the Frick, we always consider the balancing of time and resources. If it's a significant cost, it

could be a barrier. I probably don't even know enough about what costs are involved beyond our end of presenting the educational content.

Like most museums, before moving forward, the Frick would have to gain a better understanding of what financial and technical components are required for digital badge implementation and maintenance.

Questions for the field

When asked to formulate her concerns into a few core questions around the use of badges in museums, Beattie proposes:

- How do I know the earner has accomplished the badge designers' goals?
- How do I know what the goals or outcomes/accomplishments the badge really represent?

What's Next

In addition to providing new digital navigational tools, the Frick is addressing accessibility issues by creating a new pedestrian entrance and redesigning its campus walkways. Following this interview, the Frick announced the completion of a \$15 million expansion and renovation project that includes three new facilities; an expanded Car and Carriage Museum, and new Education and Community Centers. The opening public celebration will be held on Saturday, November 21, 2015.

In 2016, the Frick will launch a new membership program that will include additional levels and unique benefits. The museum will also delve into the strategic planning process, which will result in the development of a comprehensive five-year strategic plan.

For more information about The Frick, visit: <http://www.thefrickpittsburgh.org/>



Institution: The Wagner Free Institute of Science

Location: Philadelphia, PA

Annual Budget: Just over \$1 million

Staff Size: 9 full-time & 4 part-time

Annual Attendance: Approximately 37,000

Interviewee: Cara Scharf, Program & Communications Manager

Impetus for Interview

Cara Scharf is the Program & Communications Manager at the Wagner Free Institute of Science. In 2014, Scharf and some of her colleagues received an invitation to attend a Digital Badging Summit in Harrisburg, PA, presented by the Pennsylvania Statewide Afterschool Youth Development Network. While no one from her institution attended the event, it was the catalyst for an internal conversation about badges at the Wagner, and prompted her own research into the topic. Prior to these conversations, Scharf found that her colleagues were generally unfamiliar with the concept of digital badges. She herself had to look online for a definition, and found that it was difficult to find a cohesive description. Scharf felt that the definitions ranged widely, depending on the context and seemed “very piecemeal.” When considering the logistics and value of badges, some of her earliest questions were “Where do badges go?” and “What is the value of a badge that people receive from my institution?”

Through further research, Scharf identified what she recognized as two distinct ways that digital badges were being utilized; as an educational tool that recognizes learning and as a marketing strategy that motivates participation. These distinct and very dissimilar functions, seemed to “muddy the waters,” in terms of being able to clearly

define “digital badge.” While she sees benefits and challenges to both models, Scharf considers badges with an educational focus to be a more compelling use for museums. In her mind, museums already have tools and marketing strategies that exist to increase participation.

In December 2014, Scharf submitted a guest blog post on the Philadelphia Emerging Museum Professionals (PhillyEMP) website addressing digital badges. She synthesized her own research, provided some examples of how museums and other entities are implementing programs, as well as larger initiatives, such as Cities of Learning. In the closing of her post, she posed a few questions to the Philadelphia museum community:

My purpose in contributing this blog is to see if and how digital badges are being used in museums locally, and if, perhaps, the Chicago model could work here in Philadelphia. So: is anyone using digital badges in their museum and how? Education? Engagement? Both? Do you feel this has been a worthwhile venture? Do you think a city-wide model could work here?⁸⁹

While this post did not solicit any responses, Scharf also submitted a similar inquiry within an American Alliance of Museums (AAM) discussion forum. She received multiple replies from institutions that had launched badge programs, or were interested in continuing a badging dialogue, including the National September 11 Memorial & Museum, Jamestown-Yorktown Foundation, History Colorado, Carnegie Science Center, and the Smithsonian Center for Learning and Digital Access.

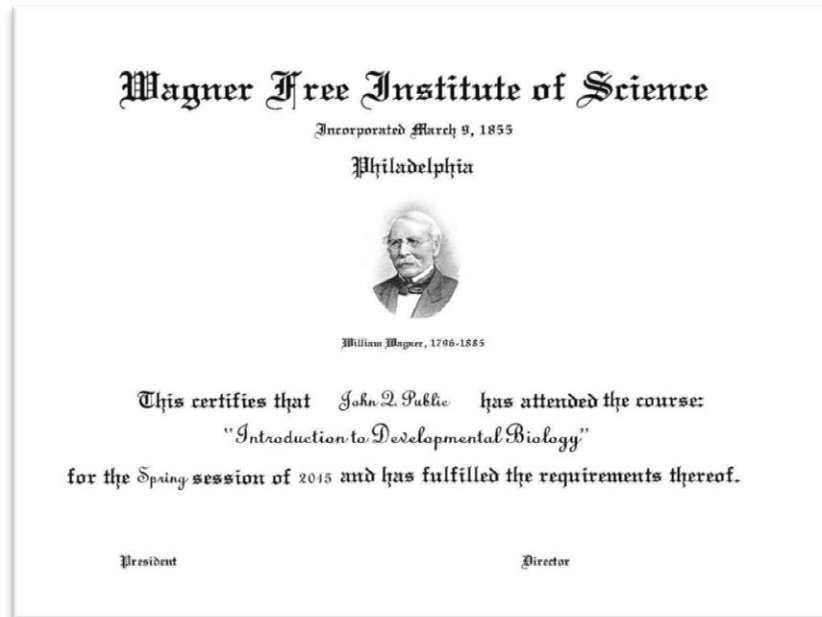
⁸⁹ Cara Scharf, “Guest Post: On Digital Badging,” *Philadelphia Emerging Museum Professionals*, December 1, 2014, accessed February 20, 2015, <http://phillyemp.com/2014/12/01/guest-post-on-digital-badging/>.

Credentialing Through Certificates

The Wagner's Adult Education courses invite participants to explore a variety of natural science topics. Scharf describes the common Wagner course participant as an adult who is interested in delving deeper into a topic that excites them. Recent course topics include *Fungi in the Garden*, *Public Health/Public Parks* and *The Periodic Table of Elements*. At the start of each session, participants make take an optional open-notes quiz, to test their knowledge of the content addressed the previous week. If one submits these weekly quizzes, upon course completion, they can pay a small fee to have their experience validated through an analogue credential: a printed certificate. Scharf is uncertain about the purpose these documents serve:

While participants request these certifications all the time, and even pay money to receive them, I don't understand why people want them, or what purpose they serve. Perhaps people add them to their resume to reflect ongoing professional development? Personally, I wouldn't care if I got a badge, but is that really what people want? My sense is that it isn't that people value the freedom to pursue a specific topic. For adults, the fact that there aren't the standards that are common to formal education is appealing. Is a badge something that will motivate? Probably not, unless badges become standardized. . . . It seems like we're putting the cart before the horse.

Figure 39 Sample of Certificate. *Source:* Wagner Free Institute of Science

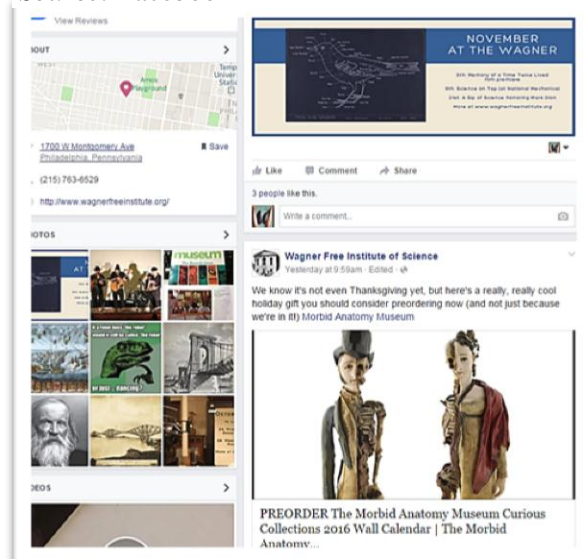


Scharf does identify some possible ways the Wagner could increase the value of its certificates. For instance, after an individual earns three certifications, perhaps they could receive a free museum membership. Still, she concedes, that certification would be internal to the institution, and consequently, may not be validated in another context. Partnering with other institutions to offer multiple certification earners discounts at other museums, Scharf believes, may be a way to increase the value of museum-issued certificates.

Digital Engagement at the Wagner

While the Wagner does not have a formal digital engagement strategy, Scharf has formulated a rough social

Figure 40 The Wagner's Facebook page. *Source:* Facebook



media purpose statement and plan to guide her own personal use of the museum's social media accounts. She explains:

We have both a Facebook and Twitter account, which I manage, and use regularly to engage audiences in conversation about our programs and collections. We also send frequent emails, including a monthly newsletter, to let people know about goings-on at the museum. In my social media plan, I state the purposes of our digital engagement tools to be:

- Increasing brand awareness/remaining top of mind for people when they are not necessarily thinking of us
- Reaching broad audiences at very little cost to advertise events, promote visitation, etc.
- Building a brand for the Wagner beyond what people know when they visit or attend a program
- Overcoming limitations of and supplementing our website by sharing real-time news and new media such as pictures and video
- Ensuring we have a voice in larger, online dialogues around topics that are important to us and our mission, such as science, history of science, Philadelphia history, etc.

I would say that we do not do any digital engagement in our galleries. This is partly because we want to create a historic aesthetic in our museum and there isn't really a place for today's technologies in that aesthetic. But I do think about how we might be able to creatively use today's technologies to engage visitors in ways that don't take away from the experience of "stepping back in time."

Although badging may not be the approach, Scharf is eager to collect more information about how visitors engage at The Wagner. As an historic site, she doesn't foresee QR codes or touch screens cohesively fitting in with the environment. Additionally, she is concerned about the expenses related to implementing and managing a badge system. Considering The Wagner's limited technological infrastructure, and financial and staff capacity, a badge program is not likely viable. Scharf explains:

With our \$1 million budget, The Wagner would need a badging tool that it could adapt. Even then, it's difficult to consider putting budgetary and staff resources into something that might fizzle out. It seems more realistic

to put energy into something that is internal, and may more reliably provide value, like an app.

There are no current plans to design this type of tool, however Scharf suggests that an app could be a way to encourage visitors to interact with the collection without additional technological infrastructure. She feels it could be useful to be able to track what and how frequently specimens are scanned. For instance, if one scans 10 specimens, they receive a badge. However, she is reluctant to actually implement that strategy, since in her mind, badges are supposed to reflect that an individual has passed a specific learning milestone. For another museum, she recognizes, the purpose of a badge could be something completely different. Once again, she reiterates the need to explicitly define “digital badge” and develop an overall standard.

Perceived Challenge: Standardization

In order for badges to become “the next big thing,” Scharf feels that standardization is crucial. Programmatically, one way to create standardization is by collaborating with other institutions to offer a shared badge. For instance, Scharf describes how some school groups visit the Wagner to learn about bugs. They explore specimens in the collection and search for bugs outdoors. However, many local institutions, such as the Academy of Natural Sciences, The Schuylkill Environmental Center, and The Franklin Institute may offer similar lessons on entomology. If these institutions designed a standardized badge that could be earned by engaging in a common lesson and activity that each partner site offers, Scharf foresees that a badge program could be more significant and valuable to both the earners and issuers. Again, she emphasizes the need for an educational standard.

Perceived Strength: Collaborative Models

Scharf is enthusiastic about the Cities of Learning Initiative in Chicago and notes how the fact that it is a large collaboration among many institutions, community organizations and local government seems to enrich the program's value. From her perspective, this city-wide partnership necessitates that the program will establish common criteria for both badge issuers and earners.

Questions for the Field

While Scharf is uncertain if digital badging will ever be an appropriate strategy at The Wagner, she wishes there was a clear way to predict the future badging landscape:

We already know that using technology as an engagement strategy is on the rise. Are badges going to become the way museums track engagement? As with any tech trend, I want to know if it's going to blow up, we don't want to be left behind. But I'm not sure if that's something we can find out. In the realm of informal learning, I don't know what's happening...It would be unfortunate if large institutions create badge systems that are proprietary and small museums are left behind. If there was a city-wide badging infrastructure that we could plug into . . .

What's Next

The Wagner is currently receiving funding through the IMLS to explore new interpretation tools within the museum. This grant is a continuation of a project initially funded through Pew Charitable Trusts. Scharf explains:

Visits to the Wagner are completely self-guided at this point, save for an introduction from a staff person when you enter. Also, the museum itself has very little interpretation available to visitors, and since our mission is largely about preserving the permanent exhibit, we are hesitant to change that too much. So the grants are very much about how we can give visitors more context about who we are, why we're important, and the stories behind our specimens given our unique (and somewhat restrictive) parameters. With Pew, we did research and then came up with a couple of prototype ideas that included a chalkboard where people could write their

favorite specimens, a postcard program where people could write/draw their impressions of the museum and mail them to themselves, and a “choose your own adventure”-type book that highlighted items in our collection and allowed visitors to learn as much or as little about them as they wanted.

In addition to further developing new interpretive tools, this IMLS funding has enabled the museum to create a grant-funded staff position to coordinate this work. The new staff member will familiarize themselves with the museums’ current visitor experience and staff protocols, and work with a planning team to develop, test, and refine prototypes. Scharf hopes that this new staff person will help the museum to implement the prototypes that are the most successful.

The Wager is also exploring how it can better collect visitor information and foster opportunities for ongoing engagement. Scharf elaborates:

Currently, we have a paper sign-in book for walk-in visitors. That information has not historically been entered into any kind of database, but we realize there is a lot of potential to use that information not just to track our visitors but also to offer future points of engagement through email, snail mail, and perhaps other means. So we are looking at how we can start keeping that information in a database and building a communications and engagement plan to ensure that visitors don’t forget about us after they visit.

For more information about the Wagner, visit: <http://www.wagnerfreeinstitute.org>

CHAPTER SIX: Conclusions

Introduction

The purpose of this study was to explore the current digital badge practices and perceptions within the museum community. It was designed primarily to gather and evaluate qualitative data with the intent that this information may help to inform future badge practice, and highlight specific badging models within the field. Out of 71 respondents familiar with the concept of digital badges within the museum context, the most frequently represented types of museums were Art Museums, Science and/or Technology museums, and History Museums. These types of institutions are represented in the current badge models presented in Chapter One, which suggests that the survey sample reflects the current composition of the museum badge ecosystem. Further, Art, History and Science institutions are the focus of the three case studies presented within this research. Due to the particular approach and response rate achieved, these results cannot be generalized to the museum field, but are both informative and suggestive of how museums use and perceive digital badges.

Demographic Characteristics of Current and Potential Issuers

Based on the demographic profiles of Current Issuers, digital badges appear to be more commonly implemented within Art, Science & Technology, and History museums. They may be more likely to be issued by institutions that have staff positions that are dedicated to digital initiatives. The annual budgets of Current Issuers are relatively sizable, averaging at \$10 million to \$24.9 million, which suggests that larger institutions may be more likely to experiment with digital badges. As expressed in earlier, early

adopters of technology tend to have a certain amount of financial flexibility.

Consequently, some Current Issuers may be able to implement badges because they possess the financial and staff capacity to take risks and create new programs.

Potential Issuers represent a wider range of museum types, sizes, and budgets. Unlike Current Issuers, Potential Issuers express some interest in having their badge programs meet a financial need. However, it remains unclear if and how digital badge programs may be able to increase an institution's bottom-line. Even though many Current Issuers represent institutions with substantial budgets, most are grant-funded initiatives. The establishment of a profit-generating badge model may demand a systematic shift in the badge ecosystem. Regardless, in order for digital badges to continue to gain traction among institutions with more limited resources, it is critical that museums have a clear understanding of what institutional investments may be required.

Badge Earner Audiences

According to the collected survey data, museums identify teens, families, and adults as their primary audiences for current and future badge programs. Museums seem to approach their earner audience in one of two ways; while half of respondents specify a single audience, the equal segment suggests that they do or will engage multiple audiences in their badge offerings. The relationships between a museum's badge earner audience and its program's goals are further explored in the case studies presented in Chapter Five. For instance, Shedd Aquarium's programs for teachers demonstrate how museums may be better equipped to offer and assess learning or competency-based programs if they focus on a single audience. Alternately, Denver Art Museum's *Rover*

illustrates how engagement-focused initiatives that seek to enhance museum experiences or collect visitor data, may be better suited for broader audiences.

Primary Goals

These data indicate that the primary objectives of current and future badge programs relate to engagement and learning. More specifically, these goals are articulated within the survey as: “increase visitor engagement,” “assess learning and skill development,” “develop more effective programs for teachers,” and “share collections with a wider online audience” (see Figure 41 on page 162). Potential Issuers denote that collecting feedback on visitors’ experiences will be an additional program aim. These data suggest that museums are interested in achieving these goals by engaging earners through online activities that are completed at home or in a classroom setting, onsite during a museum visit, or through a combination of both virtual and in-person interaction.

Intended Value for Earners

Turning to the value badges provide earners, all subgroups express that badges may provide value by rewarding participation and recognizing learning. However, Current and Potential Issuers disagree on the primary value their badges may offer earners. The majority (75%) of Current Issuers indicate that their badges give participants a way to display achievement. Still, it is unclear if and what significance this “intended value” holds for earners. Are these achievements designed to be displayed and carry currency beyond the museum context? Seeing that 44% of Current Issuers find that

“badges aren’t taken seriously by visitors” and “badges issued by my museum aren’t validated or useful outside of my institution,” the feasibility of displaying achievement for the purposes of third-party validation may be challenging (see Table 6 on page 59).

In contrast, most (72%) Potential Issuers suggest their future programs will provide value by motivating earners to engage with their museum’s collections and content. Only 31% of Current Issuers imply that their programs offer this value. If the intentions of Potential Issuers generally reflect the greater museum community, the future of badging in the field may align more closely with a participatory strategy. Institutions may feel they are better equipped to ensure the significance of a badge that based on a museum experience, rather than attempt to offer values that rely on the recognition of an outside institution or evaluator.

Perceived Challenges & Strengths of Digital Badges

When asked to rate a list of potential challenges to implementing badges in their museum, all three subgroups indicate that creating and maintaining content is the most difficult task. However, when presented with a list of potential challenges to select, each subgroup identifies unique challenges (see Table 6 on page 59). For Current Issuers, the lack of guaranteed return on investment or way of measuring effectiveness is most difficult. Presumably, this group has invested significant resources into their badge program and now may be trying to assess its impact. Intended Issuers most often identify financial and technological barriers, and express concern that badges may be too expensive or difficult to implement. Non-Issuers most frequently question motivation and inconsistency regarding the purpose and goals of badges, as well as validation and assessment. In as much as these results can speak to common challenges that occur

during the stages of badge implementation, they may be instructive for institutions in the future.

Common Challenge: Technological Feasibility

Museums do not seem to be in agreement regarding their ability to cover the technical expenses of issuing digital badges. In addition to the museum's financial and technological capacity, the size and type of earner audience, location of badge use, and the nature and goals of the program will all impact what technological infrastructure and design may be required. Onsite programs may wish to provide museum-issued mobile devices, or interactive kiosks, both of which can be a significant expense and will require maintenance. Technology may also play a role in tracking badge earner submissions. For instance, both History Colorado and Shedd Aquarium exemplify programs where the issuing institution must assess or manage earner responses. While the magnitude of its badge audience requires that History Colorado employ an automated assessment process, Douglas attributes some of the program's limitations to financial constraints; the museum cannot currently afford the technology to design a more comprehensive badging mechanism that might enable it to expand the aptitudes tested within the quiz, track incorrect responses, and more effectively measure learning.

On the other hand, Shedd has not found the technical expenses to be prohibitive, perhaps in part because it issues badges through an open source badging platform, and its badge submissions are manually assessed by staff. As a result of these decisions, Shedd was able to avoid the expenses of building a badging platform from scratch, and does not rely on this technology to evaluate badge earners. Additionally, the Frick Art and

Historical Center case study illustrates, Potential Issuers may not have a clear sense of what platform options may be available – ranging from open source technology like BadgeOS, to internally designed systems. Due to the variety of ways museums use and plan to implement badges, and variables related to an institution’s existing technological infrastructure, it is difficult to quantify the financial investment badge technology may require.

Common Strength: Value of Partnerships

The value of partnerships and collaboration was expressed through survey responses, and further explored in each case study. From sharing badge platforms and technical expertise, to collaborating on content and funding opportunities, pooling information and resources are essential practices among many successful digital badge initiatives.

Many respondents indicate an interest in replicable badge models that can be modified to meet the needs of individual institutions. As the Denver Art Museum’s *Rover* initiative illustrates, it is possible for an institution to be part of a collaborative project and still establish a model that meets the museum’s unique needs. Denver Art Museum’s partnership with the Dallas Museum of Art has enabled it to utilize a digital badge platform, and receive funding to create a program that in some ways exists beyond the digital badge paradigm; while *Rover* relies on badging platform technology, no badges are being issued or earned. Replicable program models may be beneficial, however some institutions may be interested in developing a program that is based on its unique content or audience, and hence cannot be reproduced. Nonetheless, these institutions may be able

to share and benefit from the process of sharing data, models of best practice, and standards of evaluation.

Shedd Aquarium's *Great Lakes Science Teacher Badging* program exemplifies the potential value of engaging partners to externally validate a digital badge. The Illinois Board of Education recognizes this program by awarding badge earners 20 Clock Hours. In this case, a digital badge correlates to a credential that is validated by the state. Furthermore, through a partnership with National Louis University, *Great Lakes Science Teacher Badging* Program participants are able to receive graduate credit for earning badges.

Theoretical Concerns

Some of the theoretical concerns around digital badging that were raised in Chapters One and Two relate to notions of gamification, internal versus external motivation, and a badge's utility as a pedagogical tool. This researcher finds that the data gathered both support and challenge these issues. Gamification was not a term used within the online survey instrument, however several questions included statements that referred to some of the possible motivations and characteristics of gamified strategies. For instance, statements in Question 16 included "Reward Participation" and "Display Achievement." Other questions alluded to the challenges associated with gamification, such as the statements included within Question 18, "Badges aren't taken seriously by visitors," and "Inconsistency regarding the purpose and goals of badges." Seeing that Potential Issuers express that badges could be valuable to earners because they will motivate their engagement with collections and exhibits and reward their participation, it

is likely that gamification will be an ongoing part of the badging discourse. Thus, it is advised that museums consider the positive and negative implications of gamification early in the exploratory phase of badge implementation.

As the Dallas Museum of Art's *DMA Friends* model illustrates, the earning and issuing of participatory badges often correlates to receiving external rewards and collecting visitor feedback. In some cases, these rewards may create an extrinsic motivator that can interfere with a badge earner's engagement, and may distract from the badge issuer's intended goals. For instance, an earner might become focused on collecting rewards rather than the fully participating in the experience that ultimately leads to those rewards. In turn, the data this earner provides may not be an accurate reflection of their participation, interests, or other criteria that the museum seeks to collect and measure.

The Denver Art Museum model demonstrates that one way an institution may be able to avoid extrinsically motivated responses is by eliminating the badge issuing process. While it shares the *DMA Friends* technology, in DAM's case, visitors unknowingly interact with a badging platform through *Rover*. By submitting feedback to *Rover*, users are "rewarded" with more tailored recommendations. A user's primary motivation for providing feedback is, assumedly, related to their intrinsic desire to have a more personalized museum experience. Conceivably, this may increase the likelihood that the data collected will more accurately convey a visitor's interests and experience. Granted, the Denver Art Museum presents a unique model that will not be relevant to museums that wish to actually issue badges to their audiences. If carefully designed and applied, participatory badge programs may be able to offer appropriate rewards that do

not undermine the intrinsic motivations of its earners. This may lead to mutually beneficial outcomes; intrinsically motivated badge earners may also result in the collection of more useful visitor data.

Badges for Engagement

As presented in Chapter Four, survey respondents most frequently identify that increasing visitor engagement is the primary goal of their current or potential badge program. (See Figure 6 on page 44 and Figure 18 on page 57). This supports this researcher's hypothesis that museums may find that participatory badges present fewer obstacles than pedagogically-focused badge strategies.⁹⁰ Most likely, museums that implement engagement badge initiatives will be more concerned with enhancing visitor experiences and measuring participation, than evaluating what a badge earner has learned. For instance, the Denver Art Museum's *Rover* project reflects these goals.

Badges for Learning

The utility of a badge as a pedagogical tool will be impacted by many factors, including an earner's ability to scaffold learning and their motivations for participating, as well as the issuer's assessment methods. While 50% of all survey respondents indicate that assessing learning and developing skills is a primary goal, when prompted to rate a list of potential challenges, 49% suggest that assessing a badge earner's learning is a challenge (see Table 11 on page 162). This researcher does not feel that the notion of

⁹⁰ As noted in the nomenclature, *Pedagogically-Focused Badges* are referred to as *Competency Badges*. They are digital badges that are earned through the attainment of specific skills, knowledge, or abilities that are both observable and measurable.

engagement can be separated from learning and personal-meaning making. However, a distinction may lie in how participation and learning can be measured and evaluated.

Digital badges may be a valid tool for building knowledge and developing skills, but can these types of competencies be effectively assessed through badging technology? If not, do museums have the staff capacity to manually assess learning and competency?

According to these data, 63% of all survey respondents indicate that creating and maintaining content is a challenge to implementing badges within their museum (see Figure 41 on page 163). If institutions struggle with managing internal content, some may also find that reviewing external content submitted by badge earners is a difficult or impossible task. As discussed in Chapter one, the Smithsonian Center for Learning and Digital Access' *Smithsonian Quests* was one the first museum badge programs. As of November of 2015, *Smithsonian Quests* has been suspended. Among the many factors that impacted this decision, SCLDA found that managing all components of the badging program, rather than being able to focus on its strengths as content creators, was no longer an ideal model. Manually assessing participant submissions, for instance, became a strain on staff resources. As they consider their future role in the digital badge landscape, SCLDA may transition to creating content that can be utilized by other institutions or platforms.

History Colorado's badging strategy illustrates the complicated nature of assessing learning through digital badge technology. Because the museum does not have the staff capacity to manually evaluate every badge earner's work, it created an automated quiz. However, this mechanism limits the ways that an earner's learning can be evaluated. A computer can be programmed to track queries with a selected response,

such as multiple choice, true/false, or matching questions. In contrast, forms of assessment that presents an open answer, such as an essay, are more difficult to measure through an automated process, and thus cannot be included within History Colorado's badging quizzes. As Douglas articulates, the primary goals of the institution's digital badging program are to make Colorado history accessible to students, share museum resources with teachers, and engage a wider audience through online exhibits. It could be argued that this model is more about accessibility and engagement than pedagogy. Nevertheless, this model is emblematic some of the complexities that emerge in the survey data.

Shedd Aquarium's programs for teacher professional development present a pedagogical badging model that this researcher finds to be highly successful. A significant reason for its success can be attributed to its badge earner audience. Shedd is teaching teachers, an audience that should be familiar with self-directed learning. Rather than relying on a facilitator to guide them through the new content, participants primarily scaffold their own learning. They select the science-based themes they wish to explore, and completing the badging missions at their own pace. Moreover, the aquarium has designed a thorough assessment process where staff review and provide personalized feedback for every submission. Many assignments included within the badges are assessed by a rubric. While the program's self-directed design may be ideal for teachers, Shedd's model may not be replicated among audiences that require a more scaffolded learning experience. Furthermore, it is important to note that Shedd's badge earner audiences are quite small; as of September 2015, only 28 participants have completed the

Great Lakes Science Teacher Badging program.⁹¹ If Shedd’s badging audience were comparable in size to History Colorado’s it is unlikely that the aquarium would have the capacity to manually assess every submission. Based on the research this study presents, the feasibility of digital badges to be used to recognize and assess learning among sizeable museum populations, younger audiences, or audiences that are not trained in methodologies of teaching and learning, remains unclear.

Limitations of This Study

Undoubtedly, this study is limited in scope and one of its biggest challenges relates to potential discrepancies in language and interpretation. For instance, the first survey question was designed to identify the primary audience and weed out participants who may not have relevant knowledge of or experience with digital badges. Based on their “no” response, 43, or 38% of survey respondents were classified as unfit candidates. However, many factors may have contributed to the selection of a “no” response, among them, terminology. Because there is not a unified definition or application, the term digital badge, may have caused confusion. Some survey respondents who indicated they were not familiar with digital badges within the museum context may have been appropriate participants. Others may be familiar with digital badges in other contexts and could have been able to make insightful contributions. The survey instrument was not designed to capture any qualitative data about these respondents. Had their contact information been collected, they might have been good candidates to whom this study’s

⁹¹ In comparison, during the month of September 2015, History Colorado’s online exhibits and badging website was visited 3,963 times, 1,042 online users began the process of earning a badge, and 742 badges were completed.

findings could be distributed. Those confused by terminology, unfamiliar with badging, or those with badging knowledge that is limited to other contexts could all be important audiences for further research.

Another limitation of this research is that it examines a small sample. Even if every museum that issues badges had participated in the survey, this subgroup would still be a modest sample of the museum community. It remains unclear if 16 Current Issuers and 55 Potential Issuers could be considered representative samples within the field. However, to this researcher's knowledge, it does appear that respondents represent the primary types of museums that currently issue badges.

Conclusion

This research provides suggestive rather than conclusive statistics regarding how digital badges are used and perceived within museums. Chapter Seven will further explore how these findings may be applicable to the museum field.

CHAPTER SEVEN: Applicability to the Museum Field

The Rise of Digital Culture

Digital badges are just one example of many tools that have emerged as a result of technological advances that have expanded the ways people communicate, learn and engage with the world. These changes appear within our lexicon. For instance, many survey respondents and case study interviewees have job titles that include the term “Digital.” This may be suggestive of a broader trend among museums; a desire or need to create staff roles that are dedicated to digital technology, engagement, and learning.

In response to the ever-evolving and central role of technology in society, digitally focused roles continue to emerge in many professional sectors. The impetus for this change within museums may also correspond to a growing philanthropic interest in funding technological projects. Museums may feel they will be a more desirable grantee if they can indicate they have staff dedicated to the digital realm. Also, these roles may help museums to attract a new workforce of “digital natives,” that values innovation and technology and may help these institutions to remain relevant.

As this research indicates, digital technology also impacts the way museums engage audiences. Potential Issuers most commonly suggest that their prospective badge programs will be used both online and at the museum. This differs somewhat from Current Issuers, who more often indicate that their programs occur primarily onsite. Perhaps this alludes to a future trend, where more museums will create models that blend both online and in-person participation. To a degree, the case studies of Current Issuers included within this research demonstrate blended models, as each badge program has an online component that can be accessed remotely.

Clarifying a Badge's Intended Value for Earners

In sharing their badge earner feedback, many Current Issuers imply that their audiences have expressed confusion about the goals and purpose of badges. Digital badges may be more enthusiastically received if they provide clear outcomes and relevancy to an earner's life. This may be achieved by ensuring that issuing institutions provide clear messaging about a badge's goals and intended value for earners. Third-party validation, badge standardization, and collaborative initiatives are also strategies that may enhance a digital badge's value.

Collaborative Models

Another way that museums of diverse sizes may be able to issue badges is through partnerships. Both the Frick Art and Historical Center and the Wagner Free Institute of Science made specific references to Cities of Learning initiatives. Likewise, the overall survey sample expressed great interest in collaborative or city-wide badging projects and cited public recognition, increased engagement, and access to shared resources as benefits of a collaborative model. Citywide or multi-institutional initiatives may strengthen partnerships among museums, libraries, schools, nonprofits, grant makers, and local governments. They may also enable a museum to build new audiences, share technical infrastructure and financial burdens, and allow the planning and implementation to be a participatory process across multiple institutions. Museums may find that collaborative badge models enable them to be better positioned to seek third-party validation.

Third-Party Validation of Digital Badges

In the cases of skill or competency-based programs, third-party validation may significantly increase the value for earners, and provide a stronger incentive to complete the digital badge. If a university acknowledges the value of specific badges, earners may find their badges play a significant role in the college admission process. If badges have value in the eyes of an employer, an earner may find they are able to utilize badges to enhance their resume and job candidacy. Additionally, badges validated by outside authorities may bolster the reputation of the issuing museum among stakeholders, such as funders, city leaders, educational institutions, and employers.

Nonetheless, as discussed in Chapter Two, it is important to consider that audiences often value informal learning environments because they provide an alternative to formal education. Many badge earners may be resistant to or simply not interested in pursuing a digital badge that aligns with the standards or values upheld by a third-party, particularly one that operates outside the sphere of informal learning. It is important for museums to identify the needs of their audiences, rather than assume that participants will desire badges that are validated beyond the context in which they are earned.

Increasing Accessibility through Digital Badging

As suggested above, digital badges may be a way to improve an earner's access to educational and employment opportunities. The History Colorado case study illustrates how badges may also make museum content more accessible to individuals with developmental differences. Explored in advance of a museum visit, the online exhibits and badge activities may help to introduce content, provide spatial orientation, and help

to prepare visitors for what they can expect to see and do. This program also demonstrates how digital badges may be able to reach audiences that are unable to visit the museum for any number of financial or logistical reasons. Additionally, online programs may be a way for museums to engage audiences with physical restrictions that preclude them from onsite participation. However, off-site participation often necessitates that earners have access to the required technology. While History Colorado has found that computer access is not a challenge for most Colorado students earning badges in the classroom, it remains an issue that institutions considering online programs must consider.

Accessibility is also a consideration for onsite badges. In order to use *Rover* during a visit to the Denver Art Museum, one must have access to a smartphone or tablet. While the museum does not currently offer loaner devices for visitors, they have identified this as a barrier to participation. In its newest badging program for volunteers, the Shedd Aquarium addresses such challenges by enabling participants to use computers located in an onsite computer lab. In conclusion, museums should explore how digital badges may enable them to be more accessible to current and potential audiences. By identifying the technical, developmental or other access needs potential badge earners may require and making required provisions, museums may be better equipped to issue digital badges.

Why Badging? Suggested Considerations

In addition to the suggestions proposed within the case studies presented in Chapter Five, the survey findings also highlight some basic considerations that an institution may

need to address throughout the stages of badge planning and implementation. First, as Potential Issuers, an institution may wish to consider the impact of a theoretical badge program.

- How does the badge program enable us to better accomplish our mission?
- What distinct need will digital badges address? Are badges the best way to meet this need?
- Will our program focus on participation, competency development, exploring museum collections, or something else?
- Who is our badge audience and have they expressed an interest in earning badges?
- What factors will motivate audiences to participate?
- Will badges be accessible to the audiences that would benefit from them the most?
- How will badge earners be assessed?
- Is it important for our badges to be validated? If so, by whom?

If and when an institution develops a plan, issues related to technical, logistical and financial feasibility may become the primary focus of the discourse.

- Will our badge platform be shared and developed among partners, designed as an internal proprietary system, or will we utilize an open source platform?
- How much will the development and maintenance of technology cost?
- Will badge issuing be a manual or automated process?
- How much staff time will be required to maintain the technology, update content, and oversee the issuing process?
- How will we promote the program to potential badge earners?

Finally, in preparation for launching a badge program, a museum will need to develop strategies that will enable them to assess badge earner activities, the efficacy of the program and its institutional impact.

- What methods will we use to solicit user feedback?
- Are the badge goals clearly defined for earners?
- If badges are validated outside of our institution, how are earners sharing them?
- How can we cultivate long-term engagement with badge earners?
- How do we measure success? Number of earners? Revenue? Amount of visitor data collected?

- How will the overall program be assessed by internal or external evaluators?

Granted, each museum may have unique strengths and face different challenges along the road to badge implementation. However, the previous considerations reflect the perceptions shared by museum representatives and may serve as guideposts for future digital badge practice within the field. Additionally, while these inquiries may be useful starting points, leaders in the field of digital learning have designed several resources that provide more comprehensive information about the badge ecosystem, including badge tool kits, methods of standardization, and badge platform options. A compilation of helpful online references and organizations is included in Appendix C on page 164-165.

CHAPTER EIGHT: Implications for Further Research

Evaluation & Assessment Practices

If well executed, it is likely that badges may be effective pedagogical tools. Still, it remains unclear what methods are required to adequately evaluate or quantify what an earner has learned. Further investigation is needed to examine how badge learning can be thoroughly assessed, particularly among young audiences that may need assistance in scaffolding learning. Likewise, seeing that museums expect to implement badges for purposes of engagement, it would be useful to further explore the specific strategies museums use to measure these goals. Future research could also examine how museums evaluate their digital badge programs, with a focus on how institutions articulate their metrics for success.

Exploring the Badge Earner Perspective

While this study focused on the institutional perspective, further studies could explore how museum audiences perceive and use digital badges. This data would be highly beneficial to the field, as it may be able to better understand the motivations and interest among audiences, and identify their motivations and expectations about what value and purpose badges could provide. In turn, this information may enable museums to make more informed decisions about the long-term viability and utility of digital badges within their institutions. Additional studies might also delve into the possible connections between badge earners and long-term museum engagement. For instance, are digital badges earners more likely to already be frequent museum visitors or members?

Or, are badge earners more likely to become frequent museum visitors or members as a result of their participation? The potential for badge programs to increase museum revenue is another compelling subject for future study. Are badge earners more likely to purchase museum store merchandise, attend ticketed events, or donate to the institution?

The Value of Gamification

Like digital badges, gamification is a relatively new topic of research. As presented in Chapter Two, one of the most salient critiques centers on the notion of intrinsic versus extrinsic motivation, and implies that external rewards may undermine intrinsically motivated behaviors.⁹² This researcher recognizes that game-based elements can be an effective way to motivate learning and participation. In some cases, digital badges that apply methods of gamification may transform routine tasks into motivating experiences. This strategy may refresh lackluster content, or provide an alternative, fun way for earners to better understand complex ideas. In a recently published report about the efficacy of gamification in libraries, Bohyun Kim, Associate Director for Library Applications and Knowledge Systems at University of Maryland's Health Sciences and Human Services Library asserts that there is a "right way" to design gamification:

The fact that the reach of gamification has limits should not detract from its value. We need to instead apply gamification wisely, thoughtfully, and selectively with a clear goal; a thorough understanding of the target audience, the nature of the target activity, and the gamified learning content; and appropriate and effective rewards for the intended context.

⁹² Samuel Abramovich, Christian Schunn, and Ross Mitsuo Higashi, "Are badges useful in education?: it depends upon the type of badge and expertise of learner." *Educational Technology Research and Development*, vol. 61, no 2, (2013): 217-232.

How to measure the success of gamification should be also planned ahead in relation to the goal of gamification.⁹³

Building on Kim's findings, additional research might more closely explore the challenges and opportunities associated with gamified badges in informal learning environments. If possible, this research might also highlight existing models of practice within the museum community.

Badges for All?

This researcher is eager to further examine how badges may serve as a democratizing tool in informal learning environments, as well as in the realms of formal education and employment. A significantly more comprehensive study might explore the feasibility of badges earned in informal settings to increase college access, create new job opportunities, and engage communities with unique learning and physical needs. Finally, additional inquiry into this topic might explore how digital badges are being utilized in different countries, and how these practices compare and contrast to models in the United States. Are badges a world-wide phenomenon?

The ongoing development of technology has transformed the way that people across the globe communicate, engage, and learn. Digital badges are one example of how new technical strategies can be utilized within and across a variety of contexts, including the classroom, the work place, and the museum. As the importance of 21st century skills continues to rise, perhaps digital badges will be increasingly acknowledged as a tool that

⁹³ Bohyun Kim, "Understanding Gamification," *Library Technology Reports* 51, no. 7 (2015): 34.

enables future generations to develop competencies, participate in communities, and experience success.

BIBLIOGRAPHY

- Abramovich, Samuel, Christian Schunn and Ross Mitsuo Higashi. "Are badges useful in education?: it depends upon the type of badge and expertise of learner." *Educational Technology Research and Development* vol. 61, no 2 (2013): 217-232.
- "Accreditation Statistics," *American Alliance of Museums*, January 2014, accessed September 30, 2015, <http://www.aam-us.org/resources/assessment-programs/accreditation/statistics>.
- Ahn, June, Anthony Pellicon and Brian S. Butler. "Open badges for education: what are the implications at the intersection of open systems and badging?" 2014. Research in Learning Technology, vol. 22. doi: <http://dx.doi.org/10.3402/rlt.v22.23563>.
- "About" The Badge Alliance. Accessed January 25, 2015. <http://www.badgealliance.org/about/>.
- Badges for Vets." Accessed March 15, 2015. <https://badgesforvets.org/>.
- Beattie, Laura (Associate Curator of Education, Frick Art & Historical Center). Phone Interview by Julie Woodard on July 28, 2015.
- "Better Futures for 2 million Americans Through Open Badges." *The MacArthur Foundation*. Accessed March 15, 2015. <http://www.macfound.org/press/press-releases/better-futures-2-million-americans-through-open-badges/>.
- Bowen, Kyle, and Andrea Thomas. "Badges: A Common Currency for Learning." *Change* 46, no. 1 (January 2014): 21-25.
- Brown, John S. and Richard P. Adler. "Open Education, The Long Tail and The Learning 2.0." *EDUCAUSE Review*, vol 43, no 1, (2008)" 16-20.
- "Case Study: Cooper Hewitt." *The Smithsonian Center for Learning and Digital Access*. Washington, DC. 2014.
- "Case Study: Art Lab." *The Smithsonian Center for Learning and Digital Access*. Washington, DC. 2014.
- "Certifications." *ArtLab+*. Accessed November 24, 2015. <http://artlabplus.si.edu/>.
- Davidson, Cathy. N. "Institution, Know Thyself! How Members Can Decide What Counts dmlbadges." *HASTAC*. October 9, 2011. Accessed January 25, 2015. <http://www.hastac.org/blogs/cathy-davidson/2011/10/09/institution-know-thyself-how-members-can-decide-what-counts-dmlbadge#.TpGIDNoVQUE.twitter>.
- Deterding, Sebastian, Dan Dixon, Rilla Khaled, and Lennart Nacke. "From game design elements to gamefulness: defining 'gamification.'" In *Proceedings of the 15th*

International Academic MindTrek Conference: Envisioning Future Media Environments. MindTrek 2011, 9-15. New York, NY: Association for Computing Machinery.

“Digital Badges: Unlocking Two Million Better Futures” *The Clinton Foundation*.
<https://www.clintonfoundation.org/clinton-global-initiative/commitments/digital-badges-unlocking-two-million-better-futures>. Accessed April 5, 2015.

Denver Art Museum. “Rover Mobile Website.” Accessed July-November 2015.
<http://rover.denverartmuseum.org/>.

Douglas, Laura. (Digital Project Coordinator at History Colorado) Interviewed by Julie Woodard on July 3, 2015.

Duncan, Arne. “Digital Badges for Learning.” Remarks by Secretary Duncan at 4th Annual Launch of the MacArthur Foundation Digital Media and Lifelong Learning Competition, September 15, 2011. Accessed January 20, 2015.
<http://www.ed.gov/news/speeches/digital-badges-learning>.

Elkordy, Angela. “The future is now: Unpacking digital badging and micro-credentialing for K-20 educators. *HASTAC*. October 24, 2012. Accessed January 25, 2015.
<http://www.hastac.org/blogs/elkorda/2012/10/24/future-now-unpacking-digital-badging-and-micro-credentialing-k-20-educators>.

Facebook, Inc. “Wagner Free Institute’s Facebook page.” Accessed November 3, 2015.
<https://www.facebook.com/Wagner-Free-Institute-of-Science-35431076392/?fref=ts>.

Falk, John H. *Identity and the Museum Visitor Experience*. Walnut Creek, CA: Left Coast Press, 2009.

Falk, John H. and Lynn D. Dierking, “The Contextual Model of Learning.” *Learning from Museums: Visitor Experiences and the Making of Meaning*. Walnut Creek, CA: AltaMira Press, 2000.

Finklestein, Jonathan, Erin Knight and Susan Manning. “The Potential and Value of Using Digital Badges for Adult Learners: Draft for Public Comment.” *American Institutes for Research*, Washington, DC: 2013. Accessed March 1, 2015.
http://lincs.ed.gov/publications/pdf/AIR_Digital_Badge_Report_508.pdf

Foster, John C. “The Promise of Digital Badges.” *Techniques: Connecting Education & Careers* 88, no. 8 (November 2013): 30-34.

“Framework for 21st Century Learning.” *Partnership for 21st Century Learning*. Accessed November 23, 2015. <http://www.p21.org/our-work/p21-framework>

Gamrat, Christopher, Heather Toomey Zimmerman, Jaclyn Dudek, and Kyle Peck. 2014.
“Personalized workplace learning: An exploratory study on digital badging within a

teacher professional development program." *British Journal Of Educational Technology* 45, no. 6: 1136-1148.

Galagan, Pat. "Playing Nice." *TD: Talent Development* 68, no. 9 (2014): 24-26.

Goldberg, David Theo. "Badges for Learning: Threading the Needle between Skepticism and Evangelism." *DML Central*. March 6, 2012. Accessed February 2, 2015.
<http://dmlcentral.net/blog/david-theo-goldberg/badges-learning-threading-needle-between-skepticism-and-evangelism>.

Grant, Sheryl. "Badges: Show What You Know." *Young Adult Library Services* 12, no. 2 (Winter2014 2014): 28-32.

Halavais, Alexander M.C. "A Genealogy of Badges." *Information, Communication & Society* 15, no. 3 (April 2012): 354-373.

Herold, Benjamin and Leo Doran. "MacArthur Foundation Launches Nonprofit to Scale Up Digital Learning." *Education Week*, Oct 21, 2015. Accessed October 22, 2015.
<http://www.edweek.org/ew/articles/2015/10/21/macarthur-foundation-launches-nonprofit-to-scale-up.html>.

Hickey, Daniel T. "Intended Purposes Versus Actual Functions of Digital Badges," *Re-Mediating Assessment*. September 9, 2012. Accessed January 24, 2015.
<http://remediatingassessment.blogspot.com/2012/09/intended-purposes-versus-actual.html>.

Hickey, Daniel T., Rebecca C Itow, Andi Rehak, Katerina Schenke and Cathy Tran. 2013. "Speaking Personally—With Erin Knight," *American Journal of Distance Education*, 27:2, 134-138.

History Colorado. "Online Exhibits and Digital Badges." Accessed July 3, 2015.
<http://www.historycolorado.org/educators/online-exhibits-digital-badges>

Howes, Deborah Seid. "Why the Internet Matters: A Museum Educator's Perspective" In *The Digital Museum: A Think Guide*, edited by Herminia Din and Phyllis Hecht, 67-78. Washington DC: American Association of Museums, 2007.

"IMLS Grant to Support Development of Library Digital Badging System." *The MacArthur Foundation*. March 12, 2014. Accessed February 1, 2015.
<http://www.macfound.org/press/press-releases/digital-media-learning-competition-provides-2-million-for-innovations-in-digital-badges/>

Ito, Mizuko, Kris Gutierrez, Sonia Livingstone, Bill Penuel, Jean Rhodes, Katie Salen, Juliet Schor, Julian Sefton-Gree, and S.Craig Watkins. (2013). "Connected Learning: An Agenda for Research and Design." MIT Press. Cambridge, MA. Accessed January 7, 2015. <http://dmlhub.net/publications/connected-learning-agenda-research-and-design>

- Jenkins, Henry. "How to Earn Your Skeptic "Badge" March 5, 2012 *HenryJenkins.org* (blog). Accessed March 1, 2015.
http://henryjenkins.org/2012/03/how_to_earn_your_skeptic_badge.html
- Joseph, Barry. "American Museum of Natural History Summer 2013 Badging System Report" Accessed March 17, 2015.
<http://www.mooshme.org/wpcontent/uploads/2014/04/AMNHSummer2013BadgingSystemInternalReportPUBLIC.pdf>
- Kelly, Rhea. "New Company Offers Third-Party Validation of Digital Badges." *Campus Technology*. January 6, 2014. Accessed April 29, 2015.
<http://campustechnology.com/Articles/2014/01/06/New-Company-Offers-Third-Party-Validation-of-Digital-Badges.aspx>
- Kerr, Miranda (Coordinator of Digital Learning at John G. Shedd Aquarium). Phone Interview by Julie Woodard on September 14, 2015.
- Kim, Bohyun. "Understanding Gamification," *Library Technology Reports* 51, No. 7 (2015): 29-34.
- Knight, Erin. "About." *ErinKnight.com*. Accessed January 25, 2015. www.erinknight.com.
- Knight, Erin. "More Beefs." Accessed January 25, 2015.
<http://erinknight.com/post/82103788980/more-beefs>.
- Lim, Michelle (Digital Engagement Programs Assistant at the Denver Art Museum), Melora McDermott-Lewis (Chief Learning Engagement Officer at the Denver Art Museum), Matt Popke (Developer at the Denver Art Museum). Interview by Julie Woodard on June 26, 2015.
- "LRNG." *Collective Shift*. Accessed October 22, 2015. www.lrng.org
- Mack, D. L. "Libraries and museums in an era of participatory culture." Rep. Institute for Museum and Library Services, Salzburg Global Seminar (2012). Accessed March 17, 2015. http://www.imls.gov/assets/1/AssetManager/SGS_Report_2012.pdf
- "MacArthur Spins Off Digital Media & Learning Work with \$25 Million Seed Investment." *The MacArthur Foundation*. October 6, 2015. Accessed October 10, 2015.
<https://www.macfound.org/press/press-releases/macarthur-spins-digital-media-learning-work-25-million-seed-investment/#sthash.ZdZM3YxU.dpuf>.
- Mozilla Foundation and Peer 2 Peer University, in Collaboration with The MacArthur Foundation "Open Badges for Lifelong Learning" (2011). Accessed January 7, 2015.
https://wiki.mozilla.org/images/b/b1/OpenBadges-Working-Paper_092011.pdf

- Mozilla Foundation and HASTAC “Open Badges Case Study: UC Davis Sustainable Agriculture & Food Systems” (2014). Accessed April 5, 2015.
http://www.reconnectlearning.org/wp-content/uploads/2014/01/UC-Davis_case_study_final.pdf
- “Museum Computer Network Announces MCN Workshop Series in Partnership with Learning Times.” *Learning Times*. Accessed January 19, 2015.
<http://www.learningtimes.com/news/mcn-museum-series/>.
- Naranjo, Ashley (Learning Initiatives Specialist at the Smithsonian Center for Learning and Digital Access). Interview by Julie Woodard, March 13, 2015.
- Oblinger, Diana G. Editor “Case Study 6: Mozilla Open Badges” *Game Changers: Education and Information Technologies*, *EDUCAUSE*. 2012.
- Olneck, Michael. “Insurgent credentials: A challenge to established institutions of higher education.” Paper presented to *Education in a New Society: The Growing Interpenetration of Education in Modern Life* at Radcliffe Institute for Advanced Study, Harvard University, Cambridge, MA, April 26-27, 2012.
- “Open Badges Case Study: “UC Davis Sustainable Agriculture & Food Systems” *Mozilla Foundation and HASTAC* (2014), accessed April 5, 2015,
http://www.reconnectlearning.org/wp-content/uploads/2014/01/UC-Davis_case_study_final.pdf.
- “Participating Issuers.” *Mozilla Open Badges*. Accessed April 28, 2015.
<http://openbadges.org/participating-issuers/>.
- Resnick, Mitchel. “Still a Badge Steptic.” HASTAC (February 27, 2012). Accessed March 1, 2015. <http://www.hastac.org/blogs/mres/2012/02/27/still-badge-skeptic>.
- Scharf, Cara. “Guest Post: On Digital Badging.” *Philadelphia Emerging Museum Professionals*. December 1, 2014. Accessed February 20, 2015. <http://phillyemp.com/2014/12/01/guest-post-on-digital-badging/>.
- Scharf, Cara (Program and Communications Manager at the Wagner Free Institute of Science). Interview by Julie Woodard on March 31, 2015.
- Shedd Aquarium. “Learning Planning & Evaluation: Great Lakes Teacher Badging Evaluation Report.” Prepared by Heather Schneider. February 17, 2014.
- Shedd Aquarium. “Great Lakes Science Teacher Badging.” Accessed September 20, 2015.
<http://www.sheddaquarium.org/Learning-Experiences/Educators--Classrooms/Professional-Development/Great-Lakes-Badging/>.

- Stein, Robert and Bruce Wyman. "Nurturing Engagement: How Technology and Business Model Alignment can Transform Visitor Participation in the Museum." In *Museums and the Web 2013*, N. Proctor & R. Cherry (eds). Silver Spring, MD: Museums and the Web. January 31, 2013. Accessed March 18, 2015.
<http://mw2013.museumsandtheweb.com/paper/nurturing-engagement/>
- Stein, Robert and Bruce Wyman. "Seeing the Forest and the Trees: How Engagement Analytics Can Help Museums Connect to Audiences at Scale." In *Museums and the Web 2014*, N. Proctor & R. Cherry (eds). Silver Spring, MD: Museums and the Web. February 1, 2014. Accessed February 13, 2015. <http://mw2014.museumsandtheweb.com/paper/seeing-the-forest-and-the-trees-how-engagement-analytics-can-help-museums-connect-to-audiences-at-scale/>.
- Stein, Robert, Emerald Cassidy, Jonathan Finkelstein, Andrea Fulton, Douglas Hegley, Amy Heibel, Shyam Oberoi, Kate Tinworth and Bruce Wyman. "Scaling up: Engagement platforms and large-scale collaboration." *MW2015: Museums and the Web 2015*. January 30, 2015. Accessed April 14, 2015.
<http://mw2015.museumsandtheweb.com/paper/scaling-up-engagement-platforms-and-large-scale-collaboration/>.
- "The Frick Orientation Center Interactive Experiences," Belle & Wissel Co. 2014. Accessed October 25, 2015. <http://www.bwco.info/work/the-frick/>.
- Waters, John K. "Digital Badges." *T H E Journal* 40, no. 5 (May 2013): 14-19.
- "Purdue Passport." *Purdue University*. Accessed February 1, 2015.
<http://www.itap.purdue.edu/studio/passport/>.
- "Welcome." *Smithsonian Quests*. Accessed February 2, 2015. <http://smithsonianquests.org/>.

APPENDIX A: Survey Instrument

Dear Museum Professionals:

Thank you for your willingness to participate in my graduate thesis research on how digital badges are being used within, and perceived by, museums.

I appreciate your time and insights and look forward to sharing my findings with the larger museum community.

Q1. Are you familiar with the concept of Digital Badges within the museum context?
(skip logic question- “b” responses will be sent directly to a Thank You page)

- a. Yes
- b. No

Q2. What type of museum do you work for?

- a. History museum
- b. Historic House/Historic site
- c. Art museum
- d. Zoo/Aquarium
- e. Garden/Arboretum
- f. Natural History/Anthropology museum
- g. Science and/or Technology museum
- h. Children's museum
- i. Other (please specify)

Q3. What is your position title? _____

Q4. What is your institution’s annual budget?

- a. Less than \$250,000
- b. \$250,000 to \$499,999
- c. \$500,000 to \$999,999
- d. \$1 million to \$2.49 million
- e. \$2.5 million to \$4.9 million
- f. \$5 million to \$9.9 million
- g. \$10 million to \$24.9 million
- h. \$25 million to \$49.9 million
- i. \$50 million or more
- j. Don’t know

Q5. Approximately how many on-site visitors did you have last year?

- a. Less than 25,000
- b. 25,000-50,000
- c. 50,001-100,000
- d. 100,001-250,000
- e. 250,001-500,000
- f. 500,001-999,999

- g. More than 1 million

Q6. Does your institution use digital badges in any form? (Skip Logic: see questioning for “b” “c” “d” responses on the following page)

- a. Yes, currently use
- b. Plan to implement within 3 years
- c. Plan to implement within 10 years
- d. No plans to use

If Q6. response is “a:” continue (“b” “c” and “d” skips to Q.13)

Q7. How are your digital badges primarily used?

- a. Online; primarily used as a distance learning/online program
- b. Onsite; primarily used during a museum visit
- c. Both online and at the museum

Q8. Who is the primary audience for your badge offerings? (Select all that apply)

- a. Adults
- b. Families
- c. Teens
- d. School Groups
- e. School Teachers
- f. Museum Staff
- g. Other (please specify)

Q9. Have you surveyed your audience regarding their experience with digital badges?

- a. Yes
- b. No

Q10. If you have surveyed your audience, can you describe the visitor feedback have you received?

Q11. What are the primary goals of your digital badge program? (Select all that apply)

- a. Increase visitor engagement
- b. Meet visitor demand for digital technology
- c. Collect feedback and data on visitor experience
- d. Develop more effective programs for teachers and students
- e. Assess learning and skill development
- f. Share our collections with a wider online audience
- g. Visitor giving/donations
- h. Other (please describe)

Q12. What intended value do digital badges offer your audiences? (Select all that apply)

- a. Motivate engagement with collections and exhibits
- b. Recognize specific knowledge or skills
- c. Display achievement
- d. Reward participation
- e. No value
- f. Other (please describe)

Skip Logic for Q.6: “b,” “c,” or “d.” responses (a. skips to Q.17)

Q13. How might you foresee digital badges to be used within your institution?

- a. Online; primarily used as a distance learning/online program
- b. Onsite; primarily used during a museum visit
- c. Both online and at the museum

Q14. If you were to offer badges, who would likely be the primary audience for your badge offerings? (Select all that apply)

- a. Adults
- b. Families
- c. Teens
- d. School Groups
- e. School Teachers
- f. Museum staff
- g. Other (please specify)

Q15. If you were to develop a digital badge program, what might be its primary goals? (Select all that apply)

- a. Increase visitor engagement
- b. Meet visitor demand for digital technology
- c. Collect feedback and data on visitor experience
- d. Develop more effective programs for teachers and students
- e. Assess learning and skill development
- f. Share our collections with a wider online audience
- g. Visitor giving/donations
- h. Other (please describe)

Q16. What value might digital badges offer your audiences? (Select all that apply)

- a. Motivate engagement with collections and exhibits
- b. Recognize specific knowledge or skills
- c. Display achievement
- d. Reward participation
- e. No value
- f. Other (please describe)

Q17. To what extent do you agree or disagree with the following statements?

(Select from the following options: Strongly agree/Somewhat agree/Neutral/Somewhat disagree/Strongly disagree/Don't know)

- a. Digital badges may become an essential component to our visitor engagement strategy
- b. Our organization sees the value of digital badges but lacks the ability to implement them
- c. Digital badge programs are nice to have but are not essential
- d. Digital badges are more appropriate for commercial or formal educational environments than museums
- e. Digital badges are a fad

Q18. What are the biggest challenges to digital badges? (Select all that apply)

- a. Lack of guaranteed return on investment or way of measuring effectiveness
- b. Strategy does not fit with the culture of my institution
- c. Badges aren't taken seriously by visitors
- d. Badges issued by my museum aren't validated or useful outside of my institution.
- e. Expensive or difficult to implement
- f. Inconsistency regarding the purpose and goals of badges
- g. No drawbacks
- h. Other (please specify)

Q19. How would you rate the following possible challenges to implementing digital badges in your museum?

(Select from the following options: Very challenging/Somewhat challenging/Neutral/Not very challenging/Not at all challenging/Don't know)

- a. Internal Funding
- b. External Funding
- c. Internal resources (staff capacity)
- d. Assessing a badge earner's learning
- e. Visitor demand
- f. Inconsistency regarding the purpose of badges
- g. Ability to measure effectiveness

Q20. How could the strategy of digital badges in museums be improved? (Select all that apply)

- a. Better industry recognition and acceptance of specific badges
- b. Lower cost systems to implement them
- c. Standardized requirements and criteria for similar achievements
- d. Partner with peer museums to offer badges
- e. Great already-cannot be improved
- f. Other (please specify)

Q21. Do you expect that museums will increase or decrease their use of digital badges in the future?

- a. Increase
- b. Usage will remain the same
- c. Decrease
- d. Don't know

Q22. Would you be willing to be contacted to share more about your thoughts on digital badges? If so, please include your name and email address here:

Q23. Is there anything else that you'd like to share regarding this topic that you feel wasn't addressed on this survey?

Please feel free to contact Julie directly at jwoodard@uarts.edu

APPENDIX B: Reference Charts**Table 9** Reported Museum Types of Accredited Museums n=779*Source:* American Alliance of Museums 2014 Statistics of Accredited Museums ⁹⁴

Primary Museum Type	% Of Accredited Museums
Art Museum/Center	41%
History Museum	22%
General (Multi-disciplinary)	10%
Historic House/Site	8%
Natural History/Anthropology Museum	8%
Specialized Museum (e.g., railroad, music, aviation)	4%
Science /Technology Museum/Center (includes Planetariums)	3%
Arboretum/ Botanical Garden	3%
Children's/Youth Museum	Less than 1%
Zoological Park	Less than 1%
Nature Center	Less than 1%
Aquarium	Less than 1%

Table 10 Reported Annual Budgets of Accredited Museums n=779*Source:* American Alliance of Museums 2014 Statistics of Accredited Museums

Annual Budget	% Of Accredited Museums
\$350,000 and under	8%
\$350,000–\$499,999	6%
\$500,000–\$999,999	18%
\$1,000,000–\$2.9M	30%
\$3M–\$4.9M	12%
\$5M–\$14.9M	17%
\$15M and over	10%

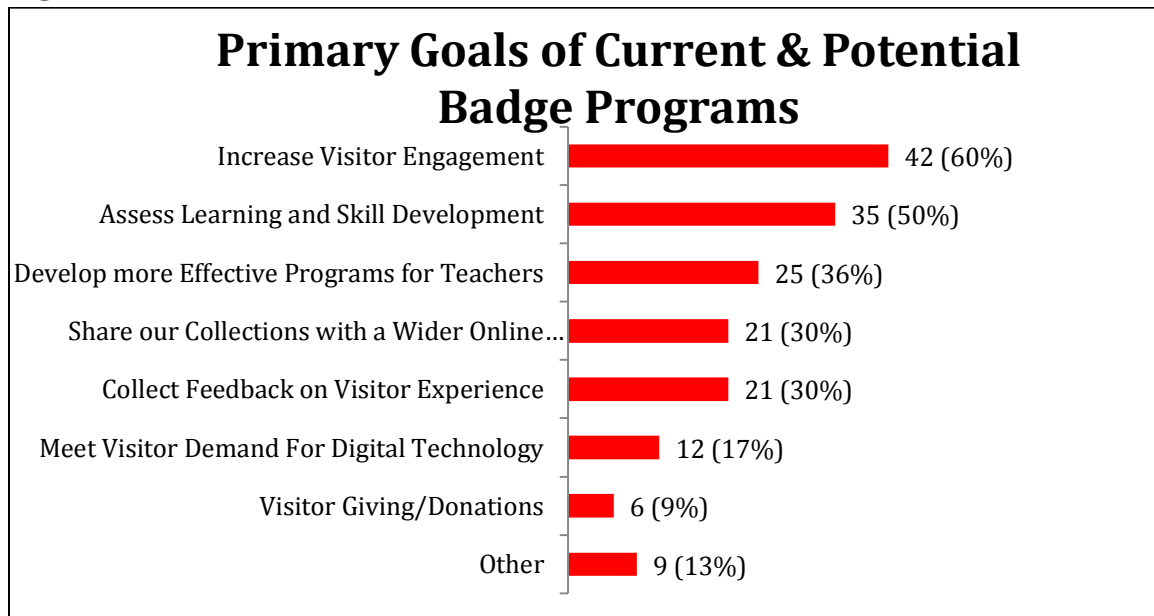
⁹⁴ “Accreditation Statistics,” *American Alliance of Museums*, January 2014, accessed September 30, 2015, <http://www.aam-us.org/resources/assessment-programs/accreditation/statistics>.

Table 11 How would you rate the following possible challenges to implementing digital badges in your museum? n=71

Possible Challenges to Implementation	Very	Somewhat	Neutral	Not Very	Not at All	Don't Know
Internal Funding	25 (35%)	23 (32%)	8 (11%)	10 (14%)	1 (1%)	2 (3%)
Creating and Maintaining Content	22 (31%)	23 (32%)	8 (11%)	5 (7%)	1 (1%)	3 (4%)
External Funding	17 (24%)	19 (27%)	10 (14%)	7 (10%)	1 (1%)	4 (6%)
Accessing a Badge Earner's Learning	13 (18%)	22 (31%)	16 (23%)	11 (15%)	2 (3%)	4 (6%)
Visitor Demand	14 (20%)	17 (24%)	18 (25%)	9 (13%)	2 (3%)	11 (15%)
Inconsistency Regarding the Purpose of Badges	11 (15%)	29 (41%)	14 (20%)	11 (15%)	2 (3%)	6 (8%)
Ability to Measure Effectiveness	12 (17%)	23 (32%)	13 (18%)	9 (13%)	5 (7%)	9 (13%)

*In Chapter Four, Current Issuer and Potential Issuer responses to this question are presented in two separate figures (Figure 6 on page 44 and Figure 18 on page 57). In Table 11, data from Current and Potential Issuers are combined to summarize the perceptions of the overall survey sample. The challenges are listed in descending order by combining the responses in the “Very” and “Somewhat” categories. References to Table 11 appear in Chapter Six on page 135.

Figure 41 n=70



*Figure 41 compiles the responses of Current Issuers responses to the question, What are the primary goals of your digital badge program? Select all that apply. “and Potential Issuers to the question, “If you were to develop a digital badge program, what might be its primary goals? Select all that apply.” These data are presented separately by subgroups in Figure 6 on page 44 and Figure 18 on page 57.

APPENDIX C: Digital Badge Resources⁹⁵

BADGE PLATFORMS & TECHNICAL RESOURCES

Platforms for Issuing Digital Badges:

<https://docs.google.com/spreadsheets/d/19Yr6XjgQcMN02aPDvN6EjPio1nmateSCG4DfZFCAYSU/edit#gid=0>

Badge System Design Template:

https://docs.google.com/spreadsheets/d/1nxMHbHO0uDLFdQKNSJkvMB98sII_mpkZ2kaE97RUIG4/edit#gid=0

LearningTimes: <http://www.learningtimes.com/what-we-do/badges/>

BadgeOS: <http://badgeos.org/badgestack/>

ORGANIZATIONS & ONLINE COMMUNITIES

Museum Computer Network: <http://mcn.edu/>

Museums and the Web: <http://www.museumsandtheweb.com/>

AAM's Center for the Future of Museums: <http://futureofmuseums.blogspot.com/>

Mozilla Open Badges Community: <http://community.openbadges.org/>

Collective Shift: www.collectiveshift.org, lrng.org

Reconnect Learning: <http://www.reconnectlearning.org/>

Digital R&D Fund for the Arts (UK-based): <http://artsdigitalrnd.org.uk/>

Digital Learning Network (UK-based): <http://www.digitallearningnetwork.net/>

⁹⁵ The resources listed within Appendix C may provide some helpful starting points for museums interested in exploring digital badges. Please note that this is not intended to be a comprehensive guide.

Digital Meets Culture (Global resource): <http://www.digitalmeetsculture.net/>

RESEARCH & REPORTS

Best Practice: Put a Badge on It

https://en-us.help.blackboard.com/Learn/9.1_2014_04/Instructor/130_Student_Performance/050_Achievements/030_Best_Practice_Put_a_Badge_on_It.
September 2014.

Learning Labs in Libraries and Museums: Transformative Spaces for Teens

https://www.imls.gov/sites/default/files/publications/documents/learninglabsreport_0.pdf
October 2014.

STEM Badges: Current Terrain and The Road Ahead

https://badgesnysci.files.wordpress.com/2013/08/nsf_stembadges_final_report.pdf
August 4, 2013.

FUNDING & EVALUATION

Institute of Museum and Library Services Guide to Funding Programs and

Opportunities: <https://www.imls.gov/assets/1/AssetManager/2015GrantOpps4pager.pdf>

Bloomberg Philanthropies' Bloomberg Connects:

<http://www.bloomberg.org/program/arts/bloomberg-connects/>

IMLS Evaluation Resources: <https://www.imls.gov/research-evaluation/evaluation-resources>

APPENDIX D: Case Study Comparisons

Institution	John G. Shedd Aquarium	History Colorado	Denver Art Museum	Frick Art and Historical Center	Wagner Free Institute of Science
Type of Badge Platform	LearningTimes/ BadgeOS	Internally Designed by Museum	Shared; basic framework designed by the Dallas Museum of Art & modified by DAM	N/A	N/A
Type of Badge/Digital Strategy	Online Professional Development for Teachers	Online Classroom Learning Tool for Students and Teachers	In-Gallery Wayfinding and Interpretative mobile website	Digitally-Based Wayfinding and Interpretative Stations located in Orientation Center	Strong Online Social Media Presence
Type of Assessment	Manual	Automated	TBD	TBD	TBD
If & How Badges are “Earned”	Completion and approval of “missions”	Reviewing online exhibits and completing a game-like quiz	None earned. Rating and filtering activities triggers internal badging mechanism to create personalized recommendations	N/A	N/A
Perceived Strengths of Digital Badge/Digital Strategy	Alleviates staff’s capacity to manage onsite programs. Third- party validation adds value for earners.	Shares collections with wider audiences. Enhances classroom learning & teaching	Benefits from shared funding & platform. May collect visitor data. Personalizes museum experience for visitors.	Provides visitors access to more in- depth content & offers campus orientation.	Low-cost way to share real-time news & updates with broad audiences .
Possible Limitations of Digital Badge/Digital Strategy	Manual assessment may only be feasible with small, specific audiences.	Automatic assessment limits the way learning can be assessed.	Requires that audiences have access to a personal mobile device.	Digital tools are stationary rather than mobile.	Some audiences may desire in- gallery digital components.