Museums and Social Issues: Heuristics for Creating Change

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Abstract

The field of informal learning has become increasingly adept at designing, measuring, and achieving learning goals for a range of audiences. However, addressing the critical social issues of our time may require new skill sets, areas of expertise, types of partnerships and assumptions about success.

To explore how informal learning practices are addressing social issues, we reviewed more than 200 articles, research studies, and evaluation reports (Morrissey *et al*. 2021). We examined the topics addressed or avoided, the types of impacts achieved, and patterns and trends that suggested gaps, opportunities, or barriers to advancing informal learning practices that address social issues.

We paid particular attention to the impacts achieved or not achieved, and to the reflections and recommendations in these articles. Drawing from what we saw, we share six heuristics that can be used as guides and, perhaps, as steps towards building generalizable principles and theories that may inform future practice: (1) Focus on how and when to engage with social issues, rather than if; (2) Develop and support talent; (3) Don't ignore entrenched societal systems and forces; (4) Collaborate outside the box; (5) Acknowledge inequities; (6) Rethink how to measure success.

Key words: Social Issues, Museum Practice, Heuristics, Social Problems

Introduction

The field of informal learning has become increasingly adept at designing, measuring, and achieving learning goals for a range of audiences, but engaging with social issues is a relatively new and evolving area of practice (e.g., Reich *et al*. 2007; Silverman 2010; Worts 2011; Sandell and Nightingale 2012; Sandell 2017; Janes and Sandell 2019; Adair and Levin 2020). However, moving that work forward towards principles that can inform evidence-based practices is difficult for several reasons.

- *Limited empirical studies on long-term or cumulative impact* – Describing and measuring the nuanced impacts of these efforts on individuals or the long-term impact on communities presents methodological challenges. Often evaluation efforts aren't designed to measure the long-term changes or the broader societal impacts (Morrissey *et al.* 2014).

- *Lack of a Shared Repository* – Literature tends to be categorized and shared by type of institution or by the nature of the literature. A climate change attitudinal study conducted at a zoo might be reported by the Association of Zoos and Aquariums or the British and Irish Association of Zoos and Aquariums, while a similar study conducted at a museum might be shared at the American Association of Museums or the Museum Association, each with different audiences and dissemination strategies. Studies funded by the National Science Foundation are archived on the

InformalScience.org website or an institution's website but may not appear in peer-reviewed journals. Research conducted by graduate students is generally only available through subscription-based research databases such as ProQuest. And many studies are only reported in gray literature (such as institutional reports) which may be less available to researchers focused on peer-reviewed literature (Onwuegbuzie and Frels 2016).

- *Lack of Shared Vocabulary* – Searching for literature is complicated by the range of terms used, each with subtle but important differences in their connotations and assumptions. Examples of terms include 'social problems' (Morrissey et al. 2014; Best 2016), 'social change' (Murawski 2021), 'museum activism' (Janes and Sandell 2019), 'social justice' (Worts 2011; Sandell and Nightingale 2012), 'socio- scientific' (Bell 2009; Kollman et al. 2013) and 'social services' (Silverman 2010).

Addressing Societal Issues through STEM (ASCs) was an effort to address this gap through a review and synthesis of research published in the last 20 years. We wanted to know how practices are evolving. What's working? What isn't working? Where are there gaps, barriers, opportunities? With funding from the National Science Foundation (*DRL-1906556*), we conducted a review of 237 articles, reports, and research papers. In this paper, we share highlights of that research and propose a set of heuristics culled from patterns and recommendations we saw across those papers.

We use the term *heuristics* deliberately, rather than *best practices*, *standards*, or even *recommendations*, although there are similarities with each of those. However, recommendations or best practices that work with one topic or one audience might not work the next day or with the next audience because public opinions about social issues are complex and fluctuate as new evidence or events emerge. Heuristics, which are often described as 'rule of thumb' or 'best guess', provide guidance while acknowledging the need to continually assess assumptions, actions, and outcomes (Gigerenzer and Gaissmaier 2011). In that context, we suggest six heuristics that can be used as recommendations and as steps towards building generalizable principles and theories that may inform future practice.

Methods

Most people think of a literature review as simply a summary of past research, perhaps conducted to inform the design of an exhibit or to launch a new study. However, advancements in sophisticated and accessible analytical software, combined with the use of systematic protocols for synthesizing and interpreting results, have led to an increased interest in research *about* reviews as a methodology and research *with* reviews as a methodology (Machi and McEvoy 2012; Booth *et al.* 2016; Onwuegbuzie and Frels 2016; Cooper 2017). Different approaches to reviews are described with labels such as *research synthesis* (e.g., Cooper *et al.* 2019), *systematic review* (e.g., Jesson *et al.* 2011), *configurative* or *aggregative review* (e.g., Gough *et al.* 2017), and *comprehensive literature review* (e.g., Onwuegbuzie and Frels 2016). While our protocols were consistent with systematic reviews (in the rigor and transparency) and configurative reviews (in the qualitative, inquiry-driven interpretation), we most often used the term research synthesis, largely because we believe that synthesizing evidence is perhaps the most difficult and yet important step in aggregating the results of a literature review. The *Handbook of Research Synthesis and Meta-Analysis* (Handbook) describes a research synthesis as:

> A review of a clearly formulated question that uses systematic and explicit methods to identify, select, and critically appraise relevant research, and to collect and analyze data from the studies that are included in the synthesis. Statistical methods (meta-analysis) may or may not be used to analyze and summarize the results of the included studies (Cooper *et al.* 2019: 535).

A research synthesis is characterized by six variables according to the Handbook: *Focus* (findings, methods, theories, or practice); *Goal* (criticism, identification of central issues, or

integration); *Perspective* (neutral or position); *Coverage* (exhaustive, selective, representational, or pivotal); *Organization* (historical, conceptual, or methodological); and *Audience* (scholars, practitioners, public, policy makers). The goal of our research synthesis was to identify central issues and themes for an audience of museum practitioners, evaluators, and researchers (Table 1). The search protocols were designed to yield a corpus that was representative rather than exhaustive, and the organization of the analysis was conceptual, aided significantly by the robust and flexible tools provided by NVIVO qualitative analysis software (Trigueros-Cervantes *et al*. 2018; Jackson 2019). The research perspective was motivated by a position that museums can and must engage with social issues in order to fulfill their mission and their responsibilities to the public.

Characteristics	**Description of ASCs research**
Focus	*Practice and application*
Goal	*Identification of central issues*
Perspective	*Espousal of a position*
Coverage	*Representative*
Organization	*Conceptual*
Audience	*Practitioners primarily, also scholars and policy makers*

Table 1: Characteristics of Research Synthesis

We drew literature from three sources: articles in peer-reviewed journals; evaluation reports posted on the website *informalscience.org*; and dissertations or theses published through ProQuest Dissertation Database. We selected these sources because they were associated with some type of expert oversight, which provided a measure of assurance for the quality of the work. Graduate research is overseen by faculty who are often recognized experts on the topic of study; publications in peer-reviewed journals have been reviewed by experts on the topic; and nationally funded projects are typically subjected to external review by experts in the field before being funded. We also believed the aggregate of these three sources would provide a more comprehensive and diverse view than a single repository. Although we recognize the global nature of most social problems, we also recognize the unique ways social problems are influenced by national norms, policies, and even language. Therefore, we limited our scope to practices within the United States, but we believe the findings are generalizable beyond those borders.

To search for relevant literature within those repositories, we relied on internal and external claims that the project addressed a social issue. Internal claims came from arguments provided within the publication that the work addresses a social issue or a social problem. External claims came from topics that were identified from public opinion polls, drawing from a selection of polls that had been rated for both reliability and political leanings.[1] For example, we reviewed polls conducted by ABC News/*Washington Post* which were rated with an A+ and leaning Democratic, as well as Marist polls rated with an A and leaning Republication. Topics that were ranked on two or more of the polls were used as keywords in the search for literature.

The results of each search were logged on a spreadsheet (Figure 1). A second spreadsheet listed each citation and the search number that yielded that citation (Figure 2). Some articles turned up in several searches, suggesting a high probability of being relevant to our research. We reviewed the meta-data, abstracts and keywords provided with each publication to confirm that the study included informal learning environments and focused on social issues. The final inventory included 110 articles from peer-reviewed journals, 50 reports, and 77 theses and dissertations for a total of 237 documents. The list of studies identified are available in an open data file.2

Search Number	Keywords	Results	Refinements
328	"Societal Concern"	2	Evaluations, Reports, and Pe
329	"Social Issue"	10	Evaluations, Reports, and Pe
330	"Societal Issue"	4	Evaluations, Reports, and Pe
331	"Social Problem"	3	Evaluations, Reports, and Pe
332	"Societal Problem"	0	Evaluations, Reports, and Pe
333	Museum* AND Energy	19	Evaluations, Reports, and Pe
334	"Science Center" AND Energy	4	Evaluations, Reports, and Pe
335	Informal AND Energy	20	Evaluations, Reports, and Pe
336	Zoo* AND Energy	1	Evaluations, Reports, and Pe
337	Aquarium* AND Energy	0	Evaluations, Reports, and Pe
338	Botanical AND Energy	1	Evaluations, Reports, and Pe
339	Museum* AND Religion	3	Evaluations, Reports, and Pe
340	"Science Center" AND Religion	0	Evaluations, Reports, and Pe
341	Informal AND Religion	4	Evaluations, Reports, and Pe
342	Zoo* AND Religion	0	Evaluations, Reports, and Pe

Figure 1: Log of searches using keywords associated with internal and external claims and words associated with informal learning organizations.

Designing Exhibits For Gender	19	Gender equity has been a national and global aim for over half a centu
Dialogue programs tackle toug	1 & 5 & 17	Society faces challenges from climate change and other increasingly t
Do It Off Broadway: Exploring t	5 & 12	What does it mean for museums to be diverse and inclusive? Does in
Effectiveness of Informal Two-v	2 & 4	This is a study about the effectiveness of natural and cultural resource
Effects of an informal energy e	13	This dissertation addresses the growing need for renewable energy ec
Emissions and Climate Forcing	12 & 17	Consumer demand for sustainably sourced seafood has given rise to
Emotions at Play: Assessing E	10	The purpose of this study was to assess and describe emotional respo
Empathy and Its Potential in M	5 & 12 & 17	This research explores the museum community's interest in empathy.
Empathy for Invertebrates: Adu	17	In recent years, developing empathy for animals has become a strateg
Encased Encounters: Remapp	14	In our current historical moment, notions of citizenship and sovereignt
Engaging Latino audiences in i	4	Environment for the Americas (EFTA), a non-profit organization, devel
Essays in energy and environn	13	This dissertation is comprised of three essays on energy and environr
Exhibiting racism: The cultural	14	Using an interdisciplinary approach and the guiding principles of new l
Exploring the Effects of Commu	2 & 14	Informal science education (ISE) venues such as zoos, nature centers

Figure 2: Potential inventory including the citation, the search(es) that yielded the citation and the abstract.

Analysis

The analysis involved iterative repetitions of four steps: mapping or describing the literature, coding the content of the literature, descriptive analysis to identify patterns and trends, and a correlational analysis to identify relationships between key variables (see Figure 3). Since most of the studies were qualitative rather than quantitative, the descriptive analysis yielded more useful and reliable results than the correlational analysis. Although there were some patterns that suggested correlations between variables (such as topic, audience, and intervention), the data set was not large enough to do the type of quantitative analysis necessary to support correlations.

Studies were classified within NVIVO by metadata (e.g., date, source of publication and

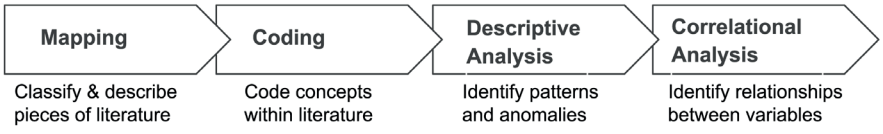

Figure 3: Steps in the Analysis

keywords) and categories suggested by our research questions, such as intended audience, discipline(s), types of impact, and intervention format. Classifying the studies allowed us to look later for patterns and trends within groups (e.g., all projects addressing climate change) or between groups (e.g., topics that were addressed within STEM-based institutions compared to topics addressed within other types of institutions). NVIVO qualitative software was used for most of the descriptive analysis, although spreadsheets were also useful for creating charts and pivot tables to support the analysis.

Each study was coded using a combination of a priori codes and emerging codes. For example, to understand the impacts of projects, a coding system was adapted from the Generic Learning Outcomes (GLOs) developed by the Arts Council England and the Six Strands of Informal STEM Learning identified by the National Research Council (NRC 2009).

Code	Description	Example
Understanding, Knowledge, Awareness	Knowing about something, learning facts or information	'participants report learning about nanotechnology, societal and environmental impacts'
Action, Behavior, Progression	What people do or intend to do, change in behavior, progression towards further learning	'reported more intentions to engage in environmentally responsible behaviors'
Enjoyment, Inspiration, Fun	Positive experiences, feeling inspired, hopeful, having fun	'offered visitors a fun and engaging environment'
Reasoning & Decision Making	Recognizing and using evidence in decisions and arguments, applying concepts, understand natural and social environment	'leading to decision-making through an enriched scientific understanding of floods'
Attitudes & Values	Opinions, feelings, or attitudes towards others or towards phenomenon	'more concerned about climate change and ocean acidification, and more hopeful'
Building Capacity	Developing resources, relationships, or infrastructure that increase ability to address missions	'relationships that increase the knowledge and capacities of all partners so they can better fulfill their missions and serve their publics'

Table 2: Codes used for intended, measured, and achieved impacts

The classification tools associated with NVIVO were particularly useful for comparing variables (or attributes) between or within groups of studies. Being able to quickly sort, search, select, or compare studies based on any individual variable or set of attributes allowed us to accomplish tasks such as sorting professional development projects by topic or comparing the impacts intended and achieved for projects targeting specific audiences.

Overview of Results

The results of the analysis are reported in other publications (e.g., Morrissey *et al.* 2021; Morrissey 2021), but a sampling is used to provide context and support for the heuristics discussed in the following section. We provide these results with the reminder that we are not reporting on what we saw in the field, but rather what we saw in the literature about the field. Our data sources are not the actual practices of museums, but the articles that describe those efforts and the evaluation reports shared in a public repository. We recognize that funding sources, publication guidelines, institutional concerns, university protocols and other factors influence what gets published, who publishes, and what is said.

What we saw in the literature:

- *Topics:* Climate change was the most common topic with a range of institutions (mostly STEM-related) offering exhibits, programs, and research. Earlier projects were more likely to focus broadly on the topic, while more recent projects explored specific implications as related to the discipline of the institution; for example, aquariums focused on ocean acidification and zoos focused on loss of species. Health was also a common topic across a wider range of institutions including children's museums, STEM-based institutions, and some art and culture-based institutions.

- *Evaluations:* The impacts that were most often intended and measured were in the category we coded as Understanding, Knowledge, or Awareness, followed by the category of Action, Behavior, or Progression. (Note: Impacts were only analyzed for projects that involved STEM-based institutions.)

- *Interventions:* Exhibits were the most common type of practice described, but other practices included dialogue-based programs, theater, media (e.g., science on a sphere), camps, and interpretive narratives.

- *Collaborations and partnerships:* There were many examples of collaborations between similar types of institutions (e.g., multiple children's museums or zoos), and partnerships between institutions that shared a disciplinary expertise (e.g., science museum and university researchers). A few collaborations were designed to connect a museum with broader audiences (e.g., partnering with clubs, religious organizations, schools).

What we didn't see in the literature:

- *Topics*: Some topics, such as incarceration and immigration, were often addressed in museum projects but were notably absent in STEM-based institutions. Other topics, such as climate change, were almost exclusive to STEM-based projects. There were very few examples of addressing gender-related issues, reproductive rights, mental health, gun regulation, immigration, the opioid epidemic, or other topics that were high on lists of public concerns. A few exceptions included an exhibit about mental health (Winfrey and McDonald 2016), an exhibit about a family with a trans grandparent (Middleton and Greene 2018), and a dialogue-based program about reproductive choice (Wagner *et al.* 2013).

- *Evaluation*: Intentions to change behaviors were a common finding, but evidence of observed, documented, or long-term behavior changes were less common. Social change was a commonly stated aspiration, but projects primarily focused on change at the individual level and didn't measure impacts on communities or social structures and practices.

- *Interventions:* We found very few examples of collections development efforts related to social issues, with the exception of a handful of projects linked to current events such as the Black Lives Matter movement (Salahu-Din 2019), changes in same sex marriage laws (Clark and Wexler 2008), and the protests at the Dakota pipeline (Kieffer and Romanek 2019).

- *Collaborations:* Collaborations across disciplines (e.g., science centers with history or art museums) or between different public sectors of society (e.g., law enforcement, commerce, government, NGOs) were rare.

Heuristics and Recommendations

1. Focus on *how* and *when* to engage with social issues, rather than *if*.

The decision to engage in social issues is often discussed as an either/or choice, often associated with 'should' or 'must.' However, the arguments provided in the papers for engaging with social issues and the range of projects suggest that the most useful question is not, 'Should museums engage with social issues?' but rather: 'How can this institution or this project engage with this particular issue and audience at this time?'

Sociologists posit that the public begins to address a social problem based on: *claims* (providing evidence of harm); *warrants* (arguments that the problem should and can be addressed); and *actions* (suggested ways to address the situation) (Best 2016). Those categories, and the examples we saw, suggest three roles or approaches for engaging with the public:

1. *Role as Knowledge-broker,* providing reliable and digestible information about social problems. Advancing knowledge about a social issue may be the role that museums are most comfortable and effective in achieving. This role was most obvious with climate change projects with exhibits and programs providing evidence of changes in ocean health (e.g., Randi Korn & Associates 2011; Kelsey 2013), glacial melting (e.g., Perry and Gyllenhaal 2010), local environmental concerns (e.g., Ratcliffe 2009; Longoni and Lugalia-Hollon 2012; Tranby 2013), loss of animal species (e.g., Wojton and Heimlich 2016) and other impacts of climate change.

2. *Role as Advocate*, calling attention to problems and providing opportunities to consider actions and trade-offs of different solutions. There were a few projects in a range of types of museums and organizations that provided opportunities for the public to share experiences and opinions about social issues or to consider possible actions through dialogue-based programs (e.g., Apley 2010; Kollmann *et al.* 2013; Blaney 2013; Porter and Garcia 2018).

3. *Role as Change Agent*, collaborating with other sectors of society to effect change in structures, policies, and practices. Although we saw few examples that were directly focused on creating social change, there were a handful of projects that worked with communities to create change at the local level, with efforts typically involving sustained and long-term relationships and engagement (e.g., Ratcliffe 2009; Cabrera and Gomberg-Munoz 2010; Gareis and Smith 2015).

2. Develop and support talent.

Ongoing professional development, and time for reflection and discussion is critical to this work. As one article stated, 'While museum educators are often well-equipped to facilitate discussions about various kinds of content, when it comes to complex, controversial topics, additional time and preparation is essential' (Porter and Garcia 2018: 295). All 14 of the studies about professional development were published in the past ten years, suggesting that professional development efforts (or evaluation of efforts) may be increasing. Evaluations showed that participants valued what they learned, appreciated the opportunities to learn with other professionals (Kelsey 2013; Fleischer 2013; Todd *et al.* 2019), and were more skilled and confident in their presentations and interactions with visitors (Sickler 2014; Gareis and Smith 2015).

While professional development opportunities seem to be effective and valued, they were sporadic and targeted, with 11 of the 14 examples connected to a specific project and funding source (often connected to a climate change initiative). We did not see any evidence of a field-wide commitment to provide professional development for the significant number of individuals who work within the field. Although many museum professionals do pursue learning opportunities through academic work or professional organizations, without external funding, those opportunities occur at significant costs to the individual and may exclude many individuals. It was disheartening to see this omission within a field dedicated to lifelong learning.

3. Don't ignore entrenched societal systems and forces.

Social problems arise from and persist because of complex combinations of actions and omissions by all sectors of society, from business to government agencies, charitable organizations, businesses, and law enforcement. Problems can be understood and solved only by acknowledging and engaging those myriad perspectives and collectively acting to create change (Kania and Kramer 2011; Senge *et al.* 2015; Kramer and Pfitzer 2016; Ennis and Tofa 2020). However, we saw very few projects that acknowledged problems at the systemic level. Most focused on the impact of individual actions such as recycling to address climate change or exercising to improve health and rarely addressed the impact of the private and public sectors. For example, a review of 19 health exhibits found that 'efforts towards creating healthy public policy were scarce and modestly described' (Christensen *et al.* 2016: 39). Similarly, a dissertation that analyzed exhibit text argued that the tendency to treat health problems as under the control of the individual is 'akin to "victim-blaming" and discounts factors such as access to health care, structural violence, and environmental harm from pollution and toxic environments' (Lee 2014: 229).

While advocating for personal action is an important step, ignoring the myriad economic, political, and societal structures is disingenuous and counterproductive. As educational institutions, museums are in a unique position to call attention to the underlying causes and complexities of social problems. As public institutions, museums can suggest ways of leveraging social change and assist the public in weighing the impacts and trade-offs associated with actions at the individual, community, or global level.

4. Collaborate outside the box.

Collaborations were discussed in more than half the articles and evaluation reports, suggesting a growing expertise and perhaps comfort with collaborations. Most collaborations included institutions with similar missions and disciplinary expertise, such as a collaboration of aquariums focused on climate change messaging (e.g., Kelsey 2013). Another type of collaboration (sometimes identified as partnerships) involved different types of institutions with complementary areas of expertise, such as a science center collaborating with university scientists (e.g., Carney *et al.* 2009; Ackerman 2016; Bell *et al.* 2016). A few collaborations combined the resources and mission of an informal learning institution with the audiences and networks provided by working with community and service agencies (e.g., Gareis and Smith 2015).

Evaluations consistently suggested that these collaborations leveraged resources, maximized impact, expanded audiences and expertise, developed professional identity, and strengthened field-wide infrastructure (Haynes 2016; Holden 2016; Sickler and Hayde 2016; Bell *et al.* 2016). They also provided an opportunity to develop a collective voice around an issue (Kelsey 2013).

However, given the complexity and systemic nature of social issues, we expected to see more cross-disciplinary collaborations. Almost any discipline can be brought to the study of social issues, including economics, psychology, sociology, science, history, philosophy, ethics, and religious studies, but we rarely saw expertise beyond that which was most closely aligned with the expertise of the institution (i.e., science, history, etc.).

We saw only a few collaborations between different types of informal learning institutions, and a very small number that involved collaborating with sectors such as businesses, social services, or legal systems. We also saw very few examples of collaborating with the groups of people who may be most affected by the particular social problems. We can't generalize from the small sample, but in the context of what we know about social issues, we hypothesize that collaborating 'outside the box' would advance the capacity of the field to address social issues.

5. Acknowledge inequities.

Social issues usually have a disproportionate impact on certain groups of people. Compounding that disparity, the ability to influence how issues are addressed is not shared equally across segments of society. Yet we saw very few examples of projects focused on the inequities associated with the impact of social problems or the control over the actions, policies, and resources needed to address problems.

Some articles suggested that ignoring these disparities was the result of trying to remain 'immune to the messy realities of the outside world' (Janes and Grattan 2019: 98) or using the concept of neutrality as 'a cover up, a distraction from the actual problem at hand' (Johnson-Cunningham 2018: 2). Interestingly, when we analyzed vernacular used in these studies, terms such as *justice* and *equity* were overwhelmingly more common in discussions about projects in culture or history-based institutions than in STEM-based institutions. STEM-based institutions that are grounded in the value of evidence have a particularly difficult but critical opportunity to bring scientific reasoning to the task of recognizing, discussing, and addressing inequities associated with social problems.

There were a few examples of projects that engaged the voice and perspective of those impacted by pervasive social issues. For example, a traveling exhibit about research in the polar regions 'chose to include the participation of Native Alaskans who would be able to report on climate change in first-person ways with stories from America's only Arctic state' (Perry and Gyllenhaal 2010: 10). The Eastern State Penitentiary's Returning Citizens Tour Guide Project hired formerly incarcerated people as tour guides based on the belief that 'in order to end mass incarceration, we need to listen to the people who are most impacted' (Robinson and Zalut 2018: 23)

Several studies and articles also called upon institutions to address issues of equity internally (Trivedi and Wittman 2018; Dirk 2018; Johnson-Cunningham 2018). As one professional stated, 'For a long time, we have tried to have those conversations with the public without having those really important intelligent conversations internally first' (Filo 2017: 20). The handful of studies that looked at how professionals experience issues of equity within their workplace suggest that creating equitable working environments involves creating and implementing inclusive policies, professional development, HR practices, intentional collection development practices and a culture that accepts risks.

6. Rethink how to measure success.

When the end goal is social change, describing *success* may require different metrics, evaluation strategies, and assumptions about evidence. Articles often discussed the unique capacity of the field to promote change at the societal level, lauding the potential for museums to 'probe our humanness' (Janes and Grattan 2019: 98), to 'become advocates for social justice' (Ünsal 2019: 595), and to 'address social issues and human rights abuses' (Carter and Orange 2012: 111). But evaluations focused on change at the individual level and typically

measured *intentions to* change behaviors or *perceptions* of changes in knowledge or attitudes rather than actual change. For example, an evaluation of a training program designed 'to catalyze public engagement with climate change' reported that as a result of the program visitors had 'greater hope about their ability to participate with others to address climate change, and greater intentions to engage in community behavior' (Geiger *et al*. 2017: 241), which is a powerful finding only limited by the fact that it measures intentions not behaviors.

This disconnect between intended, measured, and achieved goals is not surprising given practical issues such as deadlines and expectations for final reports on externally funded projects. However, there is a strong argument for changing the assumptions and expectations about what success looks like, as well as the tools and protocols traditionally used in measuring impacts within informal learning environments. Identifying the nuanced indicators of change across a community or society may yield results that look messier but may in fact more accurately capture the essence of social change. Given the dual commitments to social change and to evidence-based practices, the field of informal learning faces the challenge of developing authentic and equitable methodologies that truly measure change at the societal and even global level.

Summary

Engaging in social issues is a relatively new focus for the field of informal learning. This study revealed significant and consistent increases in the number of projects, studies, observations, and lessons learned that appear in the literature in the first two decades of the twenty-first century. This foundational research and evaluation can inform the next stages in this work and bring a foundational clarity to theory-driven practice. This analysis further suggests the need for significant and potentially difficult shifts in what we accept to be normative practices of the field, particularly around assumptions and expectations about success, and ways that success is represented by what we measure. We believe these results call on museum practice to reimagine ways to measure impact beyond a momentary transactional report by individuals as they leave an experience. It is time that we engage in a broader and more complex assessment of how museum experiences migrate beyond the experience to impact societal practices, norms, and structures.

It is our hope these heuristics honor the words and the practices of the articles, the reports, and the dissertations we had the pleasure of reading. We believe the variety of study uncovered in this work suggest that there is no singular or obvious path to achieving the changes in practice that we can imagine. Rather, every individual, every project, and every institution has an opportunity to play a unique role as a knowledge-broker, an advocate, or a change agent. Choosing and enacting these roles requires a field-wide commitment to professional development and investing in new types of collaborations where we can witness proof of the long-term impacts that flow from our work, all the while acknowledging that the inequities created and supported by entrenched societal systems and forces can be named, monitored, and changed through our actions.

This work is not and will not be easy. The promising growth we saw in the number of projects and publications reviewed in this study reflects a growing commitment to embrace this difficult work, because the benefit of being relevant to social change far outweighs the cost of being disengaged from the issues that face our world.

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Notes

1 Nate Silver, 'Which Pollsters to Trust in 2018', FiveThirtyEight, 31 May 2018. https://fivethirtyeight.com/features/which-pollsters-to-trust-in-2018/, accessed 12 July 2019.

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