Curator

Beyond Science: Implications of the *LSIE* Report for Art Museum Education

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Abstract The *Learning Science in Informal Environments* report holds great potential for creating change among those who work in the field of science education. But to what extent can it inform other sectors of the informal education world? This article explores how the *LSIE* report might influence research and practice in art museums. By comparing the report to a recent study in art education, the authors point out areas of overlap and divergence relative to content and skills, identity, and communities of practice. We suggest several implications for how art museums and science museums might learn from one another. A call to action is made for further research and discussion about common learning goals and outcomes for the art museum experience.

Introduction

The *Learning Science in Informal Environments: People, Places, and Pursuits* report represents an important moment in informal science education (National Research Council 2009). It provides significant evidence that people learn science in out-of-school settings, at all ages. It provides a consensus about clear and reasonable outcomes for science learning in informal environments, something that has been sorely lacking until now. But perhaps most importantly, it proposes a rigorous, research-based framework that articulates science-specific capabilities supported by informal environments.

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There is no doubt the *LSIE* report has value for professionals in the field of informal science education, but how might it inform the work of those in other sectors? We (Luke and Knutson) are researchers who conduct education projects with art museums. We wondered if and how the *LSIE* report might apply to research and practice in these institutions.

Setting the Stage: Assumptions about Art Museum Education

The purpose of this paper is not to consider the foundations of art education generally, nor of art museum education specifically; that has been done elsewhere (Eisner and Day 2004; Villeneuve 2008). However, it is important to briefly acknowledge the issues that characterize art museum education. Given that art museums and science museums have matured through distinct historical trajectories, they have subtle but significant variations in educational mission, practice, and research.

Historically, science museums and art museums have taken different approaches to enacting their educational role and mandate. It seems to us that science museums tend to centrally situate learning within their mission: for example, seeking to stimulate curiosity and inspire science learning for all. Art museums, on the other hand, often have multiple agendas in which learning is an important but not always a central mandate: for example, striving to preserve and research their collection while providing the public with meaningful access to works of art. This is not to discount the remarkable educational efforts carried out within art museums across the country, nor is it to ignore the progress that has been made in art museum education departments since *Excellence and Equity* documented issues facing this profession almost two decades ago (American Association of Museums 1992). But it still seems to us that education is not always central to the art museum's mission. Consider the exhibition development process, for example. In science museums, exhibitions are typically developed through a team-based approach in which educators are essential, and the development process is often driven by educational goals and outcomes for visitors. In art museums, however, exhibitions are more often than not developed by curators; educators may be part of the team, but their focus is typically on supplementing the exhibition experience with educational material after the fact. Granted, this is not the case for all art museums, and we can think of many examples of how this practice is shifting. Regardless, we would argue that—unlike science museums—art museums have not fully institutionalized an educational mandate across their various departmental functions and at the core of the experiences they offer for visitors.

What's more, art museums maintain a tension between two strongly held and conflicting beliefs about the ways a visitor should experience art within them. The two intentions are: first, to promote an aesthetic experience; second, to convey the contextual meaning of art. This unresolved issue is longstanding in the history of art museum education. In 1923, Benjamin Gilman suggested: "A museum of science is in essence a school; a museum of art is in essence a temple . . . the aesthetic purpose, the aim of art is to engage the powers; the didactic purpose, the aim of education, is to modify them.

Where the sphere of education begins, the sphere of art ends" (cited in Zeller 1989, 30). The other side of the debate asks whether we can truly experience art without some understanding of the context in which it was made. Influential art museum practitioners such as George Brown Goode, Theodore Low, and John Cotton Dana held similar views to museum director Phillip Youtz, who wrote in 1934: "We cannot study art without studying society, which produces art and in turn is produced by it. Art is meaningless without its social setting" (cited in Zeller 1989, 62). Such tensions have necessarily complicated the role of education within art museums.

Finally, research efforts in art museums and science museums are vastly different—not only in scope, but also in purpose. Although the *LSIE* report shows that there is still much work to be done, and although the research it presents has been carefully selected and filtered through a consensus-based process, it also reveals a substantial research base in place for science museum professionals to draw upon. In part, this research base is due to sizeable federal funding from the National Science Foundation, and a recognition on the part of NSF of the importance of informal science learning. While research in the area of art museum education is certainly growing, there is no doubt it has a much smaller base (Luke and Adams 2008). More work is needed to clearly articulate what results from an art museum experience, and how those results might influence practice moving forward.

For us, science museum education and art museum education are quite distinct. The two fields are positioned differently within the formal educational system as a whole, and their respective bodies of research differ in size and purpose. Most important: art museums and science museums do not necessarily agree with each other about their fundamental beliefs regarding their educational role and their place within the larger educational system.

Applying the *LSIE* Report to Art Museum Education: A Comparative Exercise

Comparing science museum education and art museum education is in some ways like comparing apples and oranges. We wondered what we might learn by examining the *LSIE* report in relation to a key research report on art museum education. How do science museums and art museums think about their educational efforts in informal learning environments? And what can we learn by making comparisons? Throughout history, people have pointed out the art in science and the science in art, but are they really so similar? Or so different?

Identifying a key research report from the field of art museum education proved difficult. As we have argued above, the research base for art museum education is still modest, growing, and has not yet fully matured to the point where a document like *LSIE* would be produced. There is no field-wide agreement on learning outcomes. Potential frameworks exist. The Generic Learning Outcomes system, for instance, offers a set of general museum-based outcomes: skills, knowledge, understanding, values, feelings, attitudes, and behavior (Hooper-Greenhill 2007; Monaco and Moussouri 2009). However, the GLOs privilege learning across a wide field and across multiple disciplines, as

opposed to focusing on content-based learning specifically. As such, this framework poses serious limitations for describing the rich, disciplinary learning that can occur from an art museum experience.

In the end, we chose *The Quality of Qualities: Understanding Excellence in Arts Education*, a study commissioned by the Wallace Foundation and conducted by Project Zero at the Harvard Graduate School of Education (Siedel et al. 2009). This report sought to identify the character of high-quality arts learning and teaching, both inside and outside of school. Project Zero researchers reviewed published literature; conducted interviews with leading arts practitioners, theorists, and administrators; and conducted site visits to exemplary art programs across a range of settings. The report documents what art educators believe is most important about educational experiences in the arts, and provides a framework for articulating learning outcomes in art education. The limitation in using the *Quality* report for our comparison is that its focus is on K-12 art education, and specifically on structured programs for this audience. As such, it does not capture the full range of life-long learning that occurs in informal environments such as art museum exhibitions (although it does include more than one art museum program in its sample). Despite this limitation, we felt the *Quality* report represented the most relevant study within the existing body of research for thinking about learning outcomes for art museum education.

The *Quality* report is not a consensus report, and it does not make its recommendations based solely on evidence found in the research record. However, at a broad level, the goals of the *Quality* report are similar to those of the *LSIE* report. Both strive to define appropriate outcomes for their field, and both mention the importance of informal learning experiences, acknowledging that people learn inside and outside of school. The *Quality* report focuses on formal educational environments, but it includes some community-based programs and notes that informal art experiences foster a deep appreciation for and curiosity about the arts. The *LSIE* report acknowledges that informal learning environments are rich with everyday science phenomena and organized to tap prior experience and interest. Table 1 shows the learning outcomes put forth in each report.

What we find interesting to notice: Content and skills—Four of the six strands of science learning focus heavily on science-specific skill development: for example, generating and using concepts and models related to science. Arts education also focuses on skills, but ones that seem broader in focus—perhaps more life-based than content-based skills—for example, problem-solving and critical thinking. The strands of science learning emphasize participation in science activities and learning practices with others, and the use of scientific language and tools. On the other hand, arts education somewhat deemphasizes the importance of artistic technique and skills. This is a sign of the times, as the field has been trying to re-emphasize the importance of humanities-based outcomes after a long period in which skills and techniques were the primary focus for arts teaching (White 2004). One interesting point concerns observation skills: the importance of looking at and seeing detail in the world around us. These skills are clearly important for

Table 1. Learning outcomes specified in the *LSIE* report and in the *Quality* report.

Strands of Science Learning (National Research Council 2009)	Purposes of Arts Education (Seidel et al, 2009)
Experience excitement, interest, and motivation to learn about phenomenon in the natural and physical world.	Foster broad dispositions and skills, especially the capacity for creative thinking and connection-making.
Come to generate, understand, remember, and use concepts, explanations, arguments, models and facts related to science.	Teach artistic skills and techniques without making these primary.
Manipulate, test, explore, predict, question, observe, and make sense of the natural and physical world.	Develop aesthetic awareness (e.g., capacity to see things from an aesthetic perspective; to see the world more fully and in more detail).
Reflect on science as a way of knowing; on processes, concepts, and institutions of science, and on their own process of learning about phenomenon.	Provide ways of pursuing understanding in the world.
Participate in scientific activities and learning practices with others, using scientific language and tools.	Help students engage with community, civic, and social issues (e.g., compassion for others; personal empowerment; leadership skills).
Think about themselves as science learners and develop an identity as someone who knows about, uses, and sometimes contributes to science.	Provide a venue for self-expression (e.g., finding personal voice).
	Help students develop as individuals (imagination, self-esteem, self-awareness; often leads to intrinsic motivation to learn).

both science museum and art museum educators, and they have been the focus of recent research interest in both fields.

What we find interesting to notice: Community of Practice—Looking at the science outcomes, we see the comparative emphasis on enculturation. Gaining entry into and participating in the practices of science, using scientific language and tools, understanding the community of scientists—these are important to science but not so important to art, according to these reports. The arts education outcomes list contains few direct references to an artistic way of knowing, or participation in an artistic community of practice. The art list sees the community more broadly and in a more "civic" light, rather than as a professional community of practice. On the one hand this might reflect the smaller research base regarding artistic skills and concepts, and the lack of consensus of what desirable content skills might be. On the other hand, it might also reflect a less focused, more open vision of the art education community generally, and the art museum education community specifically. The focus is not on educating future artists, but on educating people to be better and more aware—citizens at large.

What we find interesting to notice: Identity—The strands of science learning emphasize the salience of informal learning settings for developing learners' science-related identity—which appears to mean that learners think of themselves as people who know about, use, and sometimes contribute to science. The purposes of arts education also focus on identity, but in a broader, less discipline-specific manner. The arts education outcomes seem to focus more on personal development: by, for example, pointing out the role the arts can play in fostering self-esteem, self-confidence, and self-awareness. Arts education also invests heavily in person-in-society outcomes, emphasizing the role that the arts can play in helping learners engage with community, civic, and social issues. Science museum educators may take a page from the *Quality* report here, by considering the role of science education in fostering more personal development beyond just content-specific learning. Several studies support the ways in which informal science experiences can contribute to youngsters' personal development, by enhancing their competence, confidence, and civic engagement (see Luke, Stein, Kessler and Dierking 2007) but the field should do more work in this area.

Implications

Science museums: Engaging the "non-science-interested"—It's typically easier to see the assumptions that underlie a discipline outside of one's own domain. While learning is not the sole agenda for art museums, science museums have positioned learning at their core. Many science museum initiatives and programs operate with the goal of developing a "pipeline" intended to engage and grow new scientists. This pipeline approach permeates the *LSIE* report and the strands of science learning, and raises questions for us about the degree to which it focuses too narrowly on outcomes that simply reinforce the goals of the formal science education system. Because science museums and science education have spent a great deal of time on questions of what should be learned and how science should be taught, experiences are designed to support measurable outcomes. It seems to us that this focus comes at the expense of more "mainline" outcomes—ways in which the average non-science-interested person might come to use and value science. From the *LSIE* report and our comparative analysis here, we feel that the challenge for science museums is to find ways to more creatively engage the non-science-interested audience, by opening up the definition of what counts as science and what counts as a viable science-museum experience. While science museums have really figured out how to engage and develop science knowledge among school students, for example, the next challenge will be to find new ways to interest the more casual visitor who is not a typical science museum user and does not readily identify with or connect to the subject.

Art museums: Sustained engagement in the arts—Implicit in the *LSIE* report is an intent to design informal science experiences that focus on a youth audience, and that move this audience from one point to another: for example, from peripheral interest in the subject to a keen desire in pursuing a science-based career, or to a profound

recognition that one can contribute to science in some other way. Art museums might learn from this approach, by more strategically engaging the public in sustained experiences with art that enhance their expertise and/or relationship with the subject. Currently, art museums approach the notion of audience in a broader way. There is a foundational belief that art is good for all, at all times of life, but there is much less concern about where the audience ends up in terms of art-related expertise. The existing research and rhetoric on art museums and arts organizations reflects this broader orientation to audience. It suggests that these institutions have focused on audience mostly from the standpoint of promoting future participation in the arts and/or future arts patrons (see, for example, Greater Philadelphia Cultural Alliance 2009). The notion of participation is a general concept, and it is one that is not tied to any particular outcome other than showing up at the door. This view of "audience" is important because it might promote general and widely appealing outcomes, and we hope that science museums take something from it. Attending more specifically to outcomes—the precision of defining target audiences, interests, and outcomes that comprise the science museum pipeline approach—might help art museums to better articulate and evaluate potential learning outcomes that stem from an art museum experience.

Positioning and valuing learning—As a consensus document, the *LSIE* report provides a snapshot of what people believe is happening in the field of informal science education, providing shared vision and common frameworks for future research and practice. The art museum education community has no such consensus, and we believe that the consequences are potentially dire. Art museums need to embrace a strong and clear educational mandate, not only within education departments but institution-wide. Art museums need to transform their operations and practices so that learning is at the core of all of the experiences they offer, not just those designed or influenced by the education department. In this regard, the *LSIE* report serves as a call to action—and an example of how much more powerful the art museum education community could be with a shared purpose and common outcomes. Certainly, art museum educators have made remarkable strides in this direction over the last decade, but they have looked primarily to developmental or instrumental theories to guide their work—theories that tend to privilege individual meaning making over disciplinary content. Finding ways to support individual meaning making is a key outcome for an art museum experience, and the field has been working to develop ways to do that. However, the support for individual meaning making has come at the expense of understanding and supporting content-based learning (Meszaros 2006). Looking at the *LSIE* report might help art museum educators to come to consensus around the purpose of art museum experiences, and to strike a balance between personal development and meaning making versus content-based learning.

Emphasizing content learning, specifically—The *LSIE* report reflects the consensus of the field around the need for specific science-based skills. This report again serves as a call to action for art museum professionals to reflect on the positioning of content learning within the experiences they offer. Comparing the *LSIE* report and the *Quality* report

reveals two different approaches to disciplinary practice: one that emphasizes a trajectory and pipeline, and one that has more diffuse, mainline goals. Without stronger arguments about the intrinsic value of art experiences, art education is constantly under threat of becoming the extra that is easily cut from the school day.

At this point, there is little clarity about what exactly constitutes a quality learning experience in an art museum. We encourage art museum professionals to learn from the *LSIE* report, and begin to examine how disciplinary commitments within the art fields (art history, criticism, aesthetics, and so on) might be shaped and supported by experiences in art museum education. At this point there are few studies that document these efforts. Both authors are engaged in studies of this kind, which look at ways to examine the processes of learning that take place on the floor during an art museum visit, and how experiences in an interactive discovery gallery (for example) might transfer into learning that happens in other galleries (Knutson and Crowley, in press; Adams, Luke, and Ancelet, in press). But the field desperately needs some new models and ways of thinking about the learning processes, skills and concepts that comprise quality learning experience in art museums.

The *LSIE* report documents the strength of the informal science education field, and outlines its key role within the educational infrastructure of science education in the nation. We ask the art museum education community to take notice of this document, and to recognize their important role in the ongoing development of the art education infrastructure. And we urge the art museum education community to come together and continue the conversation we have started here in order to begin the essential task of outlining a research agenda that will document what is learned from experiences with art museums.

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