

“Rather than a wholesale transfer of methods and practices from the formal world to the museum world, we hope that a careful study of formal and informal spaces will help to identify and support the particular strengths of each.”

## **Approaching Art Education as an Ecology:** Exploring the Role of Museums

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In this article, we use two studies conducted in art museum settings as a means to discuss some of the opportunities and challenges for the field of informal art education. The first study explores artmaking processes that take place in a children’s museum, highlighting the need to consider the social nature of learning in informal environments. Second, a study with families in an art museum explores art appreciation and interpretation. Taken together—the creating and the responding—these two studies are used to point out how we might trace disciplinary processes in art beyond schools into the informal learning environments of museums. By looking across settings, applying disciplinary content as a lens, we suggest an ecology of learning opportunities for the pursuit of an education in art. Further study and documentation of informal art education experiences is needed to better understand and support the needs and opportunities for art learners in non-school environments.

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**By whatever name you choose to call it—out-of-school learning, informal learning, free choice learning, or lifelong learning—there exists a growing interest in better understanding the ways in which learning is supported in environments that lie outside the purview of schools or formal education. From our perspective, a focus on out-of-school learning should be seen as a complementary venue to expand opportunities for students (of all ages) to engage in powerful learning experiences.**

In art education, the formal and informal have been working closely together for many years. A recent Rand report illustrated how community-based art educators have become key providers of both school-based educational experiences and teacher professional development. In addition, their work provides other out-of-school learning opportunities in the arts for a wide range of audiences (Bodily, Augustine, & Zakaras, 2008). While school-based art education provides access to a certain kind of structured learning experience, typically characterized by scaffolded and sequential instruction, informal organizations are often positioned to provide other forms of experience. We argue that formal and informal arts education organizations, in tandem, are a key component of a healthy lifelong learning ecology.

By ecology, we mean the landscape of art learning opportunities that exist across a network of informal and formal educational organizations (Russell, Knutson, Crowley, Kisa, & Steiner, 2010). By employing the language of ecology, we deliberately call attention to two properties. First, an ecological perspective emphasizes the strength of diversity. Just as bio-

diversity is a measure of the health of an ecosystem, diversity in the organizational forms that provide arts education programming in a region are indicative of a robust learning ecology. When diversity is viewed as an advantage, we can appreciate how institutions capitalize on their unique affordances rather than necessarily expecting that all learning should conform to a standardized notion of quality arts education. For example, museums can take advantage of their collections to create opportunities for learners to respond to and critique master works. Ceramics class in a high school can make use of classroom studio facilities and the expertise of the teacher to create opportunities for learners to develop their artmaking skills.

Second, the ecological perspective calls attention to the web or network of relations among constituent entities. By thinking carefully about the connections or interdependence of educational organizations, we can evaluate the extent to which a region provides a full range of art education experiences across institutions, rather than assuming that all components of an arts education be provided within the constrained resources and capacity of a single organization (e.g., schools).

While rarely studied in the arts education sector (Bodily, et al., 2008), the distinct but complementary role of formal and informal education organizations has been taken up in science education. In a recent synthesis of the research literature on science education, the National Academies (National Research Council [NRC], 2009) suggest that while the formal and informal share some characteristics, informal learning environments are distinct from formal environments. They further suggest that each environment is well suited to a particular type

of activity and audience. Formal environments support regular systematic instruction within a domain, but they are perhaps less effective at responding to learner interests. Informal environments are better positioned to respond to lifelong learning interests and learner-directed experiences in a domain.

We believe that there is much to be learned by better understanding how learning takes place outside of the school environment, and how different kinds of educational experiences cumulate over time and across place within an educational ecology (Russell, et al., 2010). Informal art education experiences offer unique opportunities to engage with the discipline of art and have some specific, sometimes unique, affordances for learning. Yet to date, little research has been conducted in this area (Luke & Adams, 2008; Luke & Knutson, 2010). State standards in art education suggest a healthy arts education includes both creating and responding experiences with opportunities to develop skills across a range of media and disciplines (Pennsylvania Department of Education, 2003; Hetland, Winner, Veenema, & Sheridan, 2007). Informal art settings provide opportunities to see original works of art and support engagement with art facilitated by familial and social interaction. These are but two examples of the broad set of competencies within the scope of a formal art education agenda that can be explicitly supported in informal settings. However, we need to think more carefully about how to leverage and mediate these experiences, as well as how to articulate their role within a broader arts learning research agenda.

In this article, we draw on lessons learned in the context of two recent research studies (Knutson & Crowley, 2009 [Q: no materials dated 2009 are cited in references; should this be 2005? 2010?]; Knutson, 2004)<sup>1</sup> in order to make arguments [Q: this language seems pretty strong; would "draw conclusions" or the like be acceptable?] about how to conceptualize and support

authentic art experiences in informal settings in the context of an ecology of art learning opportunities across the life span. To illustrate the potential range in which we might study informal learning environments, we selected studies that focus on two important aspects of the formal art curriculum: creating and responding (Keiper, Sandene, Persky, & Kuang, 2009). One study examined a museum exhibit area focused on artmaking processes; other analyzed an exhibit that promotes aesthetic and art historical responses to art. Both studies address the question: What does disciplinary content learning look like in an informal museum context?

These studies were conducted by the University of Pittsburgh Center for Learning in Out of School Environments (UPCLOSE), a university-based center that works in partnership with informal learning organizations (museums and community-based groups). In our study of learning in out-of-school environments, we are interested in how disciplinary practices (e.g., in art, science, natural history) are, and might be enacted, within informal learning experiences. We work collaboratively with our partners to identify core disciplinary practices and to examine how these practices connect to the core mission of the organization. We connect to the educational research within the academic discipline for guidance in thinking about how these practices create a learning trajectory in a subject area. For example, what might a casual museum conversation about art between a parent and a child suggest about developing skills and concepts relevant to the kinds of learning in art that take place in schools? Or, how can we trace developing expertise in concepts about evolution that emerge as a child talks about dinosaur fossils in a natural history museum (Palmquist & Crowley, 2007)? Through our research projects, we hope to illuminate the contribution and role that different organizations might play in a larger regional learning ecology. Our approach is not about testing or



imposing a dominant approach or belief about what constitutes quality art learning. Rather, our work suggests that there is not a single best approach to informal art education. By taking an ecological approach to art education, we begin to understand how unique opportunities to engage with art strengthen art learning in and out of school.

### Creating Art as a Family

Our first research-informed example takes place at an arts-based children's museum. The museum has a large collection of original contemporary and historical artworks, and has a large art studio as one of its most popular exhibit areas. This museum does not offer art-making classes per se; rather, artmaking stations (printmaking, painting, clay, papermaking) exist for visitors to sit and create for as long as they wish. Technical assistance is provided through instructional text panels, and through the presence of floor staff artists who demonstrate and facilitate artmaking. No formal curriculum is presented or followed. As in most informal settings, visitors choose the degree to which they wish to pursue any creative engagement with the activity stations, and indeed, whether they finish a project at all. Experiences can be fragmentary, momentary, and subject to the spontaneous engagement or disengagement of the participants.

One of the interesting challenges of a place like this museum art studio is that visitors often arrive in family groups. Many researchers have pointed out the inherently social nature of learning in informal environments (e.g., Gleason & Schauble, 2000; Leinhardt & Knutson, 2004; NRC, 2009). Informal learning environments are often encountered within social or familial groups. As such, the learning that takes place is seen as a group and not primarily as an individual activity. Research in other domains, such as literacy education, has also looked at out-of-



Figure 1. "Real Stuff": Animated Earth (bubbling clay slip) Art Piece by Steve Eisenhauer, commissioned for the Children's Museum. Credit: Children's Museum of Pittsburgh.

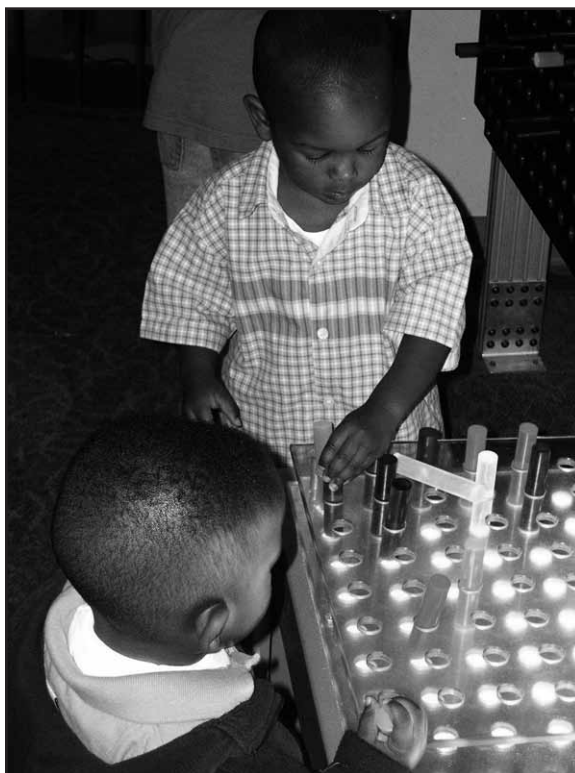


Figure 2. Children playing at a Museum Exhibit designed for exploring patterns and light. © Albert Vecerka/Esto.

school time and the role of familial influences on learning (Purcell-Gates, 2000).

Collaboration is often part of the artmaking experience in the museum art studio, and the design of experiences for the museum setting requires somewhat of a reconceptualization of typical notions of artmaking. Children visit museums with their parents or adult caretakers, yet art-making activities are often designed to support primarily the creative pursuit of individuals. Additionally, children's museums were founded to support child-directed play, and they provide opportunities for children to engage with designed experiences that support both exploration and creativity. Within the notion of developmentally appropriate practice (Bredenkamp, 1987), painting stations, clay tables, and other art activities are commonly seen in children's museums, alongside such early childhood favorites as cause-and-effect exhibits, water play areas, and kitchen and other pretend play activities such as grocery store exhibits (Maher, 1997). These activities support child-directed and peer-to-peer exploration, and traditionally, the role of the parent in these settings is seen as secondary to the core mission.

At the children's museum in our study, staff were interested in understanding and rethinking the ways that creative practices were being supported within their art studio area. With a belief in a more socio-cultural approach to learning, staff wondered how they could develop exhibits that encouraged adults to be active learners and learning partners in the museum experience. As part of a reorganization of the art studio area, we conducted observation and interview studies to help staff think about how families were using the art studio, and how they might better support parents' roles within the studio (Knutson, 2004).

The studies of the art studio included interviews of 31 parents and 22 staff at the museum, and a video observation of 50 groups of parents and children in the art studio exhibit area. Study

participants were parents and children visiting the museum, who were invited to participate in the study if they were in the art studio space. We asked parents about their beliefs about art and art education, as well as what they thought about the role of adults in children's artmaking at the museum and at home.

Findings from the video observation study suggested that most parents did not get directly involved in making art. Parents tended to stand back and observe their children, they helped to facilitate their child's work, and occasionally they offered directions or advice. Only 7% of parents spent time working on their own artworks. Staff agreed that parents should be more involved in the family's experience in the art studio, but they differed about what that involvement should look like. Some staff wanted parents to be involved and help to facilitate children's art making, feeling that ideally parents should make art themselves while they were in the art studio.

Interviews with parents and staff revealed mixed ideas about the ideal role of parents in the studio. Sixty-five percent of parents and 59% of staff felt that an adult should observe children and not get too involved, but to "just let them do their own thing." This reflects a traditional belief about the individual nature of the creative process, and a belief that adults should not interrupt or influence children's discovery. This belief was supported by another theme, that only 10% of parents and 23% of staff felt that adults should suggest ideas to children. The hands-off approach extends further for parents, with only 19% saying that an adult's role is to encourage children, while 55% of staff felt that encouragement is an important adult role. Moreover, 39% of parents and 55% of staff felt that adults should guide and facilitate children's art experiences, while 26% of parents and no staff commented specifically about the need to look out for children's safety during art experiences. And 60% of staff and 6% of parents mentioned the impor-



Q: Change chart to read, "Let children do their own thing"?

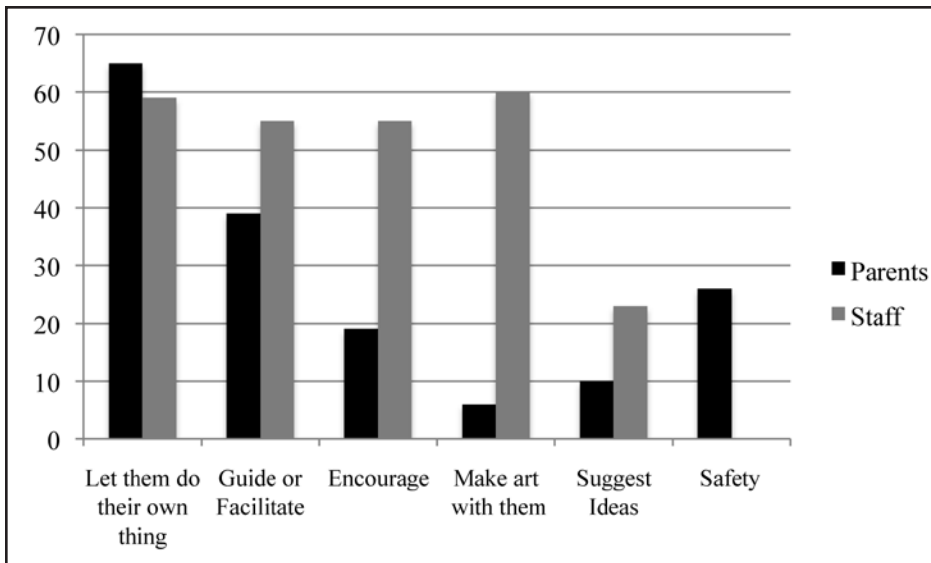


Figure 3. Parents and staff beliefs about the role of parents in the art studio.

tance of parents being engaged as a learner and artist. These results suggest that parents did not currently have the tools at hand to help scaffold their children's learning, and they did not really see themselves as being invited by the museum to participate in artmaking themselves.

The interviews and observation studies were conducted early in the redesign process, and the results gave staff much to discuss. The authors sat in on these design team meetings, and together we discussed ways that the museum might be able to facilitate experiences that were more consistent with their beliefs about art making. Upper-level and managerial staff were more likely to have indicated that parents should be making art alongside their children, while floor staff (who worked day-to-day with visitors) wanted parents to work alongside children for different reasons. Floor staff felt that some parents tended to micromanage their child's process, and they really wanted parents to do their own work so that they would not

hinder their child's process. This concern points to a tension surrounding the same kinds of deeply held beliefs about artistic creation that Efland (1988) has discussed in school-based art education settings. The results of the interview and observation studies helped the museum to address their differing assumptions about the creative process in order to move forward the museum's broader agenda for a socio-cultural based approach to learning.

The museum decided that they would try to move their practice towards a model of collaborative conversation and joint activity similar to that often promoted in science centers (Schauble, Gleason, Lehrer, Bartlett, Petrosino, Allen, Clinton, Ho, Jones, Lee, Phillips, Seigler, & Street, 2002; NRC, 2009), and counter to traditional practice in children's museums (Maher, 1997; Bredekamp, 1987). Learning, as considered in the children's museum art studio, challenges educators to rethink the role of parents as facilitators, collaborators, and even creators.

The first step was to make the space inviting to adults as well as children. The museum redesigned the studio space and other exhibit areas in the museum using a concept they called “real stuff.” This concept focused on using real objects and tools in an authentic way in settings that were inviting for adults and that could encourage joint activity. In the studio, this meant that real, as opposed to “crafty,” materials were provided. For example, a selection of brushes, palettes, and colors replaced single brush pots at the easels. Easels were both child-sized and adult-sized. Prints and a historic puppet display from the museum’s collections were hung in the space. The aesthetic of the space was carefully considered as part of the new philosophy, including natural light, hardwood floors, specially designed concrete tables created for the ceramics area, and a custom-built table for papermaking.

The next step was to design the experiences within the space with conversation and joint learning processes as a goal. Staff began to embrace the idea that parents should be seen as artists themselves, who would work side-by-side with their child, and encouraged to be more supportive and communicative about the creative process. Thus, the interactions of the floor staff and visitors, signage, demonstrations, and other forms of mediation were developed to help facilitate a collaborative adult/child experience.

The result of the redesign has been successful. The space now encourages more joint interaction and activity for parents and children. Our summative evaluations of the museum’s exhibit areas indicate that the studio is a family favorite, consistently at the top of the most loved and valued exhibit areas in the museum. Of all the exhibit areas in the museum, families also spend the most time engaging in the art studio. Although we have some indications that the art studio is working in this case, and across art museums more generally, we have only scratched the surface of the research needed to better understand the kinds of learning that takes place in hands-on art experiences in museums.

As a case study for our consideration of an educational ecology for art education, the children’s museum engages our thinking about the ways in which learning theory and research are applied to experiments with art experiences. The museum has been a leader in the use of evaluation and research to create innovative exhibits and experiences (Knutson & Crowley, 2005). By challenging their own assumptions, exploring new designs, and working to understand their audience, the best [Q: this presents a value judgment; would “most effective” be acceptable as a substitute?] museums can serve as laboratories for innovation in art education. A research-driven process can help informal art education settings maximize the learning




Figure 4. “Real Stuff”: Parent and child making paper together at the Children’s Museum. Credit: Children’s Museum of Pittsburgh.

opportunities they are uniquely positioned to provide. At the same time, this process can help to broaden our understanding of what quality art education looks like across a range of settings within the educational ecology.

### **Appreciating Art as a Family**

Our second illustrative example comes from a study of family conversations in an art museum. This work stemmed from questions that have been grappled with in the museum education field for many years. How do people talk about or interpret art? How can we empower visitors to feel confident making interpretations about art?

A widely used program has been developed to tackle just such questions: Visual Thinking Strategies (VTS) Understanding in Education [VUE], 1999.  **is Visual Thinking Strategies the org that created VUE? The introductory sentence is unclear, since it refers to Visual Thinking Strategies as the program itself.** This program is used by museums across the country, and it provides a way to get school groups to have non-threatening exploratory conversations about artworks, using visual evidence. Although the program is very popular and in widespread use across the United States, we are not alone in wondering how this empowerment may facilitate learning. For example, in cases where visitors are empowered to make their own meanings, are some meanings more valid than others? If all meanings are equally valid, what does a professional in the field have to offer? Why do we have curators and art educators in museums? Without the need (or access to) additional mediation or scaffolding, how might an average visitor build expertise in art over time and across visits? In short, how can we take visitors from personal reactions to disciplinary interpretation in the informal world? At one extreme, Meszaros (2006) suggests that the move into personal meaning making in programs such as VUE has resulted in what she calls

the “whatever interpretation,” an approach that does a disservice to the museum being called an educational institution. She argues that, wary of being perceived as being too authoritative, many museums allow their galleries to become an interpretive free-for-all. Under the guise of being respectful of a visitor’s own meaning making activities, museums have backed away from the hard task of deciding what to say to visitors about the art. The well-informed visitor may still know enough about art and art history to construct rich interpretations during a visit, but what about the average visitor or family? Meszaros challenges the field to re-engage in the difficult task of helping all their visitors learn about art and art history in museums.

Science museums have long explored the conversations of visitors as a means to access developmental trajectories of science related processes, skills, and concepts (e.g., NRC, 2009). They have also spent many years designing mediation and analyzing visitor response to find out how they might begin to scaffold science-related conversations among families in museums (e.g. Allen, 2002; Allen & Gutwill, 2009). We wondered what we might learn if we began to look at conversations in art museums in a similar way.

To this end, we designed a study of the conversations of 50 family groups as they looked at four different artworks in a survey art museum. Each group consisted of one parent and one child between the ages of 8-11 years old. We asked families to visit and talk about the selected art objects as they normally would. We took families to the target objects and stood back while they conversed. Families wore cordless microphones, and their conversations were recorded and later transcribed and analyzed.

We were interested to examine the ways that families talked about art, but we also wanted to look for any differences that might exist between the kinds of conversations that different genres of art might encourage. We



selected four artworks for the study, using VUE guidelines for being family-friendly (VUE, 1998). They included recognizable scenes and familiar settings with details to notice and discuss. We chose a large narrative painting with many characters in the scene of a crowd, painted in a colorful expressionist style. The second object was a landscape painting. This pastoral scene depicted cows, milkmaids, green hills, and trees



an Italianate landscape setting. We included a terracotta [Q: hyphenated?] sculpture of a bust with a small figure of a dog and child. The fourth object came from the decorative arts collection, a large ornate bed from the 17th century.

Prior research on art museum conversation focused on the structure of discourse, noting whether visitors were noticing, explaining, evaluating, and so on (Leinhardt & Knutson, 2004). This has been useful and tells us *how*<sup>2</sup> visitors talk. However, such coding does not account for *what* visitors are talking about. Are they engaging with art content? Are they learning about culture and context? We designed a coding scheme that would categorize talk related to select disciplinary categories relevant to art education.

With this in mind we came up with four broad categories: criticism, creation, context, and connections (Knutson & Crowley, 2010). These categories draw upon curriculum standards and notions of the art disciplines that appear in state standards (e.g., Pennsylvania Department of Education, 2003). *Criticism* refers to art criticism and relates to formal models of art criticism. This category notes when families noticed details and described or analyzed visual details in a work of art. *Creation* refers to the artist. Whenever families referred to techniques, intention, or skills that artists used or decisions that were made by someone in the process of creating the artwork, they were discussing the creation of the work. This talk may sound like talk captured in the criticism category, but it is distinguished by reference to someone creat-

ing the work. *Context* refers to the time and place in which an object was made. The *connections* category was created to account for the ways in which family members tried to draw upon prior experiences, or joint experiences, to make sense of the artwork. From prior museum learning research, and learning research more generally (NRC, 2009), we know that this is an important aspect of the learning process, and it is something that occurs a great deal in informal environments.

Table 1 shows the average number of times each category was coded in the talk of a subset of the 50 families in the study (16 families who looked at the same set of 4 artworks). Families talked most at the narrative painting, with an average of 25 coded comments, followed by the decorative art object, sculpture, and landscape painting. Most of this difference appears due to the large number of criticism comments at the narrative painting, as families spent much time noticing elements in the large and detailed crowd scene.

A second finding is that families used, on average, each category of talk at least once while viewing an object. Unsurprisingly, criticism is clearly the most common kind of talk at each object. Conversations about objects would necessarily involve noting details within the object and making sense of them with respect to the overall object. Context talk was the lowest category, except at the bed, where creation was lowest. When we designed the study, we thought that different kinds of objects might promote different kinds of art talk. It appears from Table 1 that it was easier, in this case, to think about the artist while looking at fine art, and harder to think about a creator when faced with a functional/decorative object like the bed.

This study helps us think about ways in which we might trace connections to the art disciplines in conversations about art in a museum. We hope that this kind of work might help to revive the debate in art education about what might

	Criticism	Creation	Context	Connections	Total
Narrative painting	16	4	2	3	25
Landscape painting	5	2	1	2	10
Narrative sculpture	9	3	1	1	14
Decorative arts object	8	1	4	4	17

Table 1. Average number of family comments in each category of talk.

count as a useful outcome for an art museum experience. While the informal is good at experimenting, it has not been terribly strong about committing to and assessing a clear set of outcomes. This conversational analysis provides a different vantage point into how we might think about the learning processes that take place in informal settings. Other work in the field, such as the *Quality of Qualities* report (Seidel, Tishman, Winner, Hetland, & Palmer, 2009) and *Studio Thinking* (Hetland et al., 2007), are also taking up the challenge of documenting outcomes for arts experiences in both formal and informal settings. While there are a diverse set of ways that people learn about art in and out of school, is there, or could there be, a common language for art education outcomes? Continuing work on outcomes for diverse art settings will help us to find a common language for what a powerful art learning experience might look like.

### Conclusions

The nature and means by which learning might be supported is a topic of great interest for art educators in the informal sector. The informal educators with whom we work have always been interested in how their programs might connect with the work of schools and

their curriculum. In recent years, such educators have become even more attuned to the needs of the formal system. The informal education system tracks curriculum standards and policies in the formal educational system, responding in immediate ways to each new policy that emerges. For example, No Child Left Behind quickly resulted in a national symposium called "No Museum Left Behind?" (2008), where discussion focused on how K-12 accountability pressures have created tensions, and even a sense of crisis, in the informal learning community. The policy put pressure on museums to make their experiences fit the curriculum, and to create more worksheets and tests for their field trips at the expense of the more affective, broad, and inquiry-based experiences they had traditionally offered.

However, an ecological view of the field suggests that there may be important implications that apply if one takes a broader view across the formal and informal parts of the ecology. Rather than a wholesale transfer of methods and practices from the formal world to the museum world, we hope that a careful study of formal and informal spaces will help to identify and support the particular strengths of each.



For example, both studies in this article point toward the collaborative and social nature of experiences in the informal sector, as well as the role of learners' direction and interest in determining the way in which disciplinary content is picked up, or not. [Q: does this sentence reflect your meaning as recast? If not, please clarify.]

Many of the large-scale efforts to study outcomes in arts education have been focused on instrumental outcomes (Bodily et al., 2008). While instrumental measures may have kept art in the school curriculum, they have not helped to further the most needed conversations about what learning should look like and how to promote authentic learning in art. More recently, we see the afterschool community similarly focusing on instrumental academic outcomes. This too might be shortchanging its most powerful impacts by looking too closely after the needs of school-based outcomes, and not at the kinds of broader outcomes that are supported by informal learning experiences (Birmingham, Pechman, Russell, & Mielke, 2005; Bodily, & Beckett, 2008; Fashola, 1998; Little & Harris, 2003).

Prior research on informal and formal educational systems has mostly considered the two as separate worlds. We have argued in this article that important linkages exist between them, and that a more useful view would be to see them as interrelated parts of a regional education ecology. There are issue, resource, and stakeholder interdependencies. K-12 policy has ripple effects throughout the system. Charter schools, home schooling, and the school improvement industry have begun to challenge our notions of what is a legitimate part of the K-12 system. As key sources of funding, foundations play an important, though often invisible, role in shaping regional educational priorities. As the Rand study pointed out, informal art edu-

cation providers are playing an important role within the formal art education sector (Bodily et al., 2008). There is a great need for research and policy discussion about the nature and kinds of learning that take place across both formal and informal art education sectors. By working more closely with our informal partners, we might begin to reinvigorate the discussion about the importance and value of art education for our students and citizens.

We feel that an ecological view of art education could become an important driver of change for the field of art education. Thinking about art education as an ecology implies that diverse niches within the field are a strength for art learning. Informal art education is unlike informal science education. Art museums have strongly supported the formal system, but institutionally, education has not been the primary driver (Meszaros, 2006). In the science education field-trip literature, we find evidence that school was the agenda, and so science museums tried to make themselves more like school (Anderson, Kisiel & Storksdieck, 2006; NRC, 2009).

As in any ecological system, we suggest that a healthy art learning ecology needs each institution to play to its strength. The goal is not to develop a monoculture of art where school experiences are grafted into informal settings, or vice versa; rather, we hope that each institutional type is able to develop their own powerful and authentic art experiences. Different experiences might then give the learner access to different perspectives on what art can be as they move across time and place. At the same time, an ecology is connected, and it is a system in balance. We think a closer conversation about what a powerful lifelong trajectory would look like in and out of school will promote coherence in the art education infrastructure.

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## ENDNOTES

- 1 This article is not intended to provide a full description of the studies; rather, we employ the findings to make a conceptual argument about the power of diversity in a regional arts ecology. For a full description of study methodology and findings, see Knutson, 2004, and Knutson & Crowley, 2010.
- 2 Studying learning in informal settings poses its own set of challenges to researchers, and over the past 20 years, the field of informal learning research has blossomed (National Research Council, 2009). This research has been guided predominately by the influence of National Science Foundation and the hands-on science museum field, but studies have been conducted in all kinds of museums and other informally programmed and unprogrammed spaces. Finding ways to look for and assess learning in these settings is a particular methodological challenge, as many participants may not engage in the activity with learning as a primary motivation. Researchers have used novel observation techniques, such as timing and tracking, to unobtrusively measure behavior and engagement (Serrell, 1998). Other studies have tried to capture the nature of the experience itself by recording and analyzing conversational practices in museums (e.g., Leinhardt, Crowley, & Knutson, 2002). The goal has been to retain as much of the natural intention and experience as possible. In these settings, administering a formal assessment of learning (e.g., a test) is not aligned with the nature of the experience.